

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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**DECEMBER 18, 2019
FEDERAL AID PROJECT NO. 1096(111)
STATE PROJECT NO. 96-201**

**REHABILITATION OF BRIDGE NO's. 01218 and 04180
I-84 EB/WB OVER HOUSATONIC RIVER**

Towns of Newtown and Southbury

STANDARD SPECIFICATIONS

The State of Connecticut, Department of Transportation, Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 817, 2016, as revised by the Supplemental Specifications dated January 2019 (otherwise referred to collectively as "ConnDOT Form 817") is hereby made part of this contract, as modified by the Special Provisions contained herein. Form 817 is available at the following DOT website link <http://www.ct.gov/dot/cwp/view.asp?a=3609&q=430362>. The current edition of the State of Connecticut Department of Transportation's "Construction Contract Bidding and Award Manual" ("Manual"), is hereby made part of this contract. If the provisions of this Manual conflict with provisions of other Department documents (not including statutes or regulations), the provisions of the Manual will govern. The Manual is available at the following DOT website link <http://www.ct.gov/dot/cwp/view.asp?a=2288&q=259258>. The Special Provisions relate in particular to Rehabilitation of Bridge Nos. 01218 & 04180 Interstate 84 over Housatonic River in the Towns of Newtown/Southbury.

CONTRACT TIME AND LIQUIDATED DAMAGES

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

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

1. For this contract, an assessment per day for liquidated damages, at a rate of Six Thousand Dollars (\$6,000.00) per day shall be applied to each calendar day the work runs in excess of the One Thousand Two Hundred and Eighty-Six (1,286) allowed calendar days for the contract.
2. For this contract, an assessment per hour for liquidated damages shall be applied to each hour, or any portion thereof, in which the Contractor interferes with normal

traffic operations during the restricted hours given in Article 1.08.04 of the Special Provisions. The liquidated damages shall be as shown in the following tables entitled "Liquidated Damages Per Hour" for each hour, or any portion thereof, in which the Contractor interferes with normal traffic operations during the restricted hours.

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

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

LIQUIDATED DAMAGES PER HOUR

SPN: 0096-0201

Bridge No. 01218 - I-84 between Exit 8 (RTE 6) off-ramp to Exit 19 on-ramp 1-84 Eastbound 2 Through Lane Section	
If Working Periods Extends Into	A.M. 1 Lane Closure
1st Hour of Restrictive Period	\$500
2nd Hour of Restrictive Period	\$500
3rd Hour or any Subsequent Hour of Restrictive Period	\$4,000
Bridge No. 04180 - I-84 between Exit 7 (RTE. 7 & US 202) on-ramp to Exit 18 on-ramp I-84 Westbound 2 Through Lane Section	
If Working Periods Extends Into	A.M. 1 Lane Closure
1st Hour of Restrictive Period	\$10,000
2nd Hour of Restrictive Period	\$40,000
3rd Hour or any Subsequent Hour of Restrictive Period	\$50,000

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

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

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

NOTICE TO CONTRACTOR – POTENTIAL MODIFIED AWARD SCHEDULE

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

NOTICE TO CONTRACTOR - PRE-BID QUESTIONS AND ANSWERS

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

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

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

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

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

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

NOTICE TO CONTRACTOR – MARKER PERMIT APPLICATION

The Contractor is hereby given notice that the Connecticut Department of Transportation (Department) requires additional coordination with the DEEP Boating Division prior to any in-water work or mobilization within the river. The Contractor shall submit to the Department the anticipated locations and positioning of the beacons (signs) associated with the Boat Safety Plan. Locations shall be provided with GPS coordinates according to N.A.D. 1927. Upon receipt of said coordinates, the Department will formally submit this information to the DEEP Boating Division to process a Marker Permit Application. The DEEP Boating Division requires a minimum of two months to process the application. In-water work or mobilization within the river is contingent upon receiving the authorized approval of the Marker Permit.

NOTICE TO CONTRACTOR - ALL-INCLUSIVE DRAINAGE

ADDED SECTIONS:

2.86 – DRAINAGE TRENCH EXCAVATION

ROCK IN DRAINAGE TRENCH EXCAVATION

5.86 – CATCH BASINS, MANHOLES AND DROP INLETS

6.86 – DRAINAGE PIPES

DRAINAGE PIPE ENDS

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

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

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

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

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

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

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

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

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

NOTICE TO CONTRACTOR - ARCHITECTURAL AND INDUSTRIAL MAINTENANCE COATINGS

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

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

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

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

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

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

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

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

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

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

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

TABLE 1		
Coating Category	Phase I	Phase II
	manufactured prior to May 1, 2018 VOC content limit (g/L)	manufactured on or after May 1, 2018 VOC content limit (g/L)
Aluminum roof coating	--- ¹	450
Antenna coating	530	--- ¹
Antifouling coating	400	--- ¹
Basement specialty coating	--- ¹	400
Bituminous roof coating	300	270
Bituminous roof primer	350	350
Bond breaker	350	350
Calcimine recoater	475	475
Clear wood coating - Clear brushing lacquer²	680	275
Clear wood coating - Lacquer^{2,3}	550	275
Clear wood coating - Sanding sealer^{2,4}	350	275
Clear wood coating - Varnish²	350	275
Concrete curing compound	350	350
Concrete or masonry sealer/ Waterproofing concrete or masonry sealer	400	100
Concrete surface retarder	780	780
Conjugated oil varnish	--- ¹	450
Conversion varnish	725	725
Driveway sealer	--- ¹	50
Dry fog coating	400	150
Faux finishing coating²	350	350
Fire resistive coating	350	350
Fire retardant coating - Clear	650	--- ¹
Fire retardant coating - Opaque	350	--- ¹
Flat coating	100	50
Floor coating	250	100
Flow coating	420	--- ¹
Form-release compound	250	250
Graphic arts coating (sign paint)	500	500
High temperature coating	420	420
Impacted immersion coating	780	780
Industrial maintenance coating²	340	250
Industrial maintenance coating	340	250
Low solids coating	120	120
Magnesite cement coating	450	450
Mastic texture coating	300	100
Metallic pigmented coating	500	500
Multi-color coating	250	250

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

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

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

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

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

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

-END-

NOTICE TO CONTRACTOR – BARGE ACCESS AND STORAGE

The Contractor shall not use state-owned boat launches to launch or remove barges. The Contractor may use state-owned boat launches and parking areas to launch safety boats and small crew boats. At no time shall the Contractor store material within the boat launch parking areas or impede access to the boat launch ramp.

A designated navigation channel with a minimum width of 75 feet shall be provided and maintained throughout construction except during closure periods that are approved by the Engineer. The Contractor shall secure barges, when not in use, in areas that are outside of the designated navigation channel by using spuds or tying off to the existing piers or temporary trestles.

The Contractor shall also refer to the applicable permits for additional requirements.

NOTICE TO CONTRACTOR – 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 - CONSTRUCTION CONTRACTOR
DIGITAL SUBMISSIONS

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

Shop drawings, working drawings, and product data shall be created, digitally signed and delivered by the Contractor in accordance with the Department's [Contractor Digital Submission Manual](#) (CDSM). Other deliverables that are required by other special provisions shall be similarly submitted.

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

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

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

NOTICE TO CONTRACTOR - ELECTRONIC ENGINEERING DATA (EED)

The EED is an assembly of engineering data files that were used to produce the Contract plans.

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

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

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

- Native Format
 - Bentley MicroStation CAD files (dgn)
 - Bentley SS2 InRoads Alignment Files (alg)
 - Bentley SS2 InRoads Digital Terrain Models (dtm)
 - Bentley SS2 InRoads Preference File (xin)
- Converted Format (for use in GPS/RTS Site equipment)
 - AutoCAD CAD files (dxf)
 - Alignment files (xml)
 - Surface Models (xml)

For a complete list of EED files, see the EED file manifest (PDF) located in the EED_0096-0201.zip file (0096-0201 is the project number) which is posted with the contract PS&E's on the State Contracting portal.

NOTICE TO CONTRACTOR - ENVIRONMENTAL INVESTIGATIONS

An environmental site investigation has been conducted that involved the sampling and laboratory analysis of soil and sediment collected from various locations and depths within the project limits. The results of this investigation indicated the presence of polynuclear aromatic hydrocarbons (PAH) at concentrations exceeding the applicable Connecticut Department of Energy and Environmental Protection (DEEP) Remediation Standard Regulations (RSRs) in the soils within the project limits. In addition, low-level concentrations of extractable total petroleum hydrocarbons (ETPH) and PAHs were detected in soil and sediment at concentrations below the applicable DEEP RSR criteria. The testing results in this report indicate levels of various contaminants that the Contractor may encounter during construction. Actual levels found during construction may vary and such variations will not be considered a change in condition.

Based on these findings, the entire project has been designated as an Area of Environmental Concern (AOEC) for soil. The AOEC is limited to soil located at the surface to eight (8) feet below current grade. All soil is to be reused within the project limits so that no contaminated soil is generated for off-site disposal.

In addition, all sediment within the project limits has been designated as a sediment “Low Level” Area of Environmental Concern (SED-LLAOEC), where the compounds detected were at concentrations below the numeric criteria. The presence of the compounds at these concentrations will not require material handling measures beyond those required for normal construction operations. Material excavated from within the SED-LLAOEC cannot be reused within the project limits and shall be transported to the existing Waste Stockpile Area (WSA) located at Interstate 84, Exit 16 for waste characterization and off-site disposal at an approved treatment/disposal facility in accordance with Item No. 0020763A – Disposal of Sediments.

Material removed from catch basins within the project limits will be brought to the existing project WSA or as directed by the Engineer for waste characterizations and offsite disposal.

The DEEP groundwater classification beneath the site is GA. Groundwater was not encountered during the environmental investigation and therefore no groundwater samples were collected and analyzed. Dewatering fluids encountered during construction activities should be managed and discharged in accordance with the construction dewatering permit for the project. However, if contamination is encountered during dewatering activities, controlled management and disposal of contaminated groundwater in accordance with DEEP permits may be required.

The Contractor is hereby notified that controlled materials requiring special management or disposal procedures may be encountered during construction activities conducted within the project limits. Therefore, the Contractor will be required to implement appropriate health and safety measures for all construction activities to be performed within the AOEC. These measures shall include, but are not limited to, air monitoring, engineering controls, personal protective equipment and decontamination, equipment decontamination and personnel training.

WORKER HEALTH AND SAFETY PROTOCOLS WHICH ADDRESS POTENTIAL AND/OR ACTUAL RISK OF EXPOSURE TO SITE SPECIFIC HAZARDS IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.

All suitable material excavated within the AOEC shall utilized as fill/backfill within the originating AOEC in accordance with the following conditions: (1) such soil is deemed to be structurally suitable for use as fill by the Engineer; (2) such soil is not placed below the water table; 3) the DEEP groundwater classification of the area where the soil is to be reused as fill does not preclude such reuse; and (4) such soil is not placed in an area subject to erosion. Material within the AOEC is to be reused on-site prior to use of other soils and/or fill such that no excess materials requiring off-site disposal are generated from the AOEC.

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

- Item No. 0020763A – Disposal of Sediments
- Item No. 0101000A - Environmental Health and Safety
- Item No. 0101130A – Environmental Work - Solidification

The Contractor is alerted to the fact that the Department’s environmental consultant will be on site for excavation activities within the SED-LLAOEC and AOEC to collect sediment/soil samples (if necessary) and to observe site conditions for the Department. **The existing WSA is located at I-84, Exit 16 as shown on the plans and is to be used exclusively for temporary stockpiling of excavated materials from within project SED-LLAOEC for determination of disposal classification. Access to the WSA may be limited.**

Information pertaining the environmental investigation discussed can be found in the document listed below. These documents shall be available for review electronically at the Office of Contracts, 2800 Berlin Turnpike, Newington, Connecticut.

- Task 910 – Regulatory Compliance. Bridges #01218 & #04180 Over Housatonic River, Newtown/Southbury, Connecticut, DTC, Inc. November 2018.

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 (<http://www.wdol.gov/dba.aspx>) as may be revised 10 days prior to bid opening. The Department will no longer physically include revised Federal wage rates in the bid documents or as part of addenda documents. These applicable Federal wage rates will be incorporated in the final contract document executed by both parties.

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

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

**NOTICE TO CONTRACTOR – 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 – HAZARDOUS MATERIALS INVESTIGATIONS

Limited hazardous materials site investigations have been conducted at Bridge Nos. 01218 & 04180, I-84 EB & WB over Housatonic River in Newtown/Southbury, Connecticut. The scope of inspections were limited to the representative components projected for impact.

Results of the survey identified lead paint to be present on the structural steel/metal bridge components of Bridge Nos. 01218 and 04180.

Waste stream sampling results of the structural steel/metal bridge components of Bridge No. 01218 characterized that paint waste stream as non-hazardous, non-RCRA waste. Waste stream sampling results of the structural steel/metal bridge components of Bridge No. 04180 characterized that paint waste stream as CTDEEP/RCRA hazardous waste.

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

At Bridge No. 01218, grey brittle caulking at the base of the walkway safety fencing supports was sampled and found to contain asbestos. Expansion joint caulking, black expansion joint fillers and other various caulking at Bridge Nos. 01218 and 04180 were sampled and found to be non-ACM.

No bird/pigeon guano accumulations, bloodborne pathogen concerns or other hazardous/regulated items were identified in accessible areas of the two bridges.

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

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

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

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

- Item No. 0020801A – Asbestos Abatement

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

Information pertaining to the results of the limited hazardous materials investigation discussed can be found in the document listed below. This document shall be available for review electronically.

- HazMat Inspection Letter, Bridge Nos. 01218 & 04180, I-84 EB & WB over Housatonic River, Newtown/Southbury, January 22, 2019.

NOTICE TO CONTRACTOR - PORTLAND CEMENT CONCRETE (PCC) MIX CLASSIFICATIONS

SECTIONS 6.01 and M.03 MIX CLASSIFICATION EQUIVALENCY

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

Concrete Mix Classification Equivalency Table

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

Table Notes:

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

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

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

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

NOTICE TO CONTRACTOR - PROCUREMENT OF MATERIALS

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

NOTICE TO CONTRACTOR - PROTECTION OF EXISTING UTILITIES

Existing utilities shall be maintained during construction except as specifically stated herein and/or noted on the plans and as coordinated with the utilities. The Contractor shall verify the location of underground, structure mounted and overhead utilities. Construction work within the vicinity of utilities shall be performed in accordance with current safety regulations.

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

Representatives of the various utility companies shall be provided access to the work, by the Contractor.

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

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

The Contractor shall be liable for all damages or claims received or sustained by any persons, corporations or property in consequence of damage to the existing utilities, their appurtenances, or other facilities caused directly or indirectly by the operations of the Contractor.

Any damage to any existing private and public utility, as a result of the Contractors operations, shall be repaired to the Utilities and Engineer's satisfaction at no cost to the State or the Utilities, including all materials, labor, etc., required to complete the repairs.

The Contractor's attention is directed to the requirements of Section 1.07.13 – "Contractor's Responsibilities for Adjacent Property and Services".

Prior to opening an excavation, effort shall be made to determine whether underground installations, i.e., water, sanitary, gas, electric ducts, communication ducts, etc., will be encountered and, if so, where such underground installations are located. When the excavation approaches the estimated location of such an installation, the exact location shall be determined by careful probing or hand digging, and when it is uncovered, proper supports shall be provided for the existing installation. Utility companies shall be contacted and advised of proposed work prior to the start of actual excavation, as noted above.

NOTICE TO CONTRACTOR - QUALITY CONTROL PROGRAM

ITEM #0969053A CONTRACTOR QUALITY CONTROL PROGRAM LEVEL 2

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

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

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

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

NOTICE TO CONTRACTOR – SITE NUMBER DESIGNATIONS

For the purposes of this contract, the following site designations shall apply:

BRIDGES

Site No. 1: Bridge No. 04180 – I-84 WB over Housatonic River

Site No. 2: Bridge No. 01218 – I-84 EB over Housatonic River

TEMPORARY WORKS (ACCESS ROAD AND TRESTLE)

Site No. 1: Southbury side of the Housatonic River

Site No. 2: Newtown side of the Housatonic River

NOTICE TO CONTRACTOR – USE OF STATE POLICE OFFICERS

The Department will reimburse services of State Police Officers as a direct payment to the Department of Emergency Services and Public Protection. Payment for State Police Officers must be approved by the Engineer. Any State Police Officers used by the Contractor for its convenience is the responsibility of the Contractor. A separate payment item for State Police Officers is not included in this Contract.

Any costs associated with coordination and scheduling of State Police Officers shall be included in the lump sum bid price for Item No. 0971001A – Maintenance and Protection of Traffic.

NOTICE TO CONTRACTOR – VERIFICATION OF PLAN DIMENSIONS AND FIELD MEASUREMENTS

The Contractor is responsible for verifying all dimensions before any work is begun. Dimensions of the existing structures shown on the plans are for general reference only; they are not guaranteed. The Contractor shall take all field measurements necessary to assure proper fit of the finished work and shall assume full responsibility for their accuracy. When shop drawings and/or working drawings based on field measurements are submitted for approval and/or review, the field measurements shall also be submitted for reference by the reviewer.

In the field, the Contractor shall examine and verify all existing and given conditions and dimensions with those shown on the plans. If field conditions and dimensions differ from those shown on the plans, the Contractor shall use the field conditions and dimensions and make the appropriate changes to those shown on the plans as approved by the Engineer. All field conditions and dimensions shall be so noted on the drawings submitted for approval.

There shall be no claim made against the Department by the Contractor for work pertaining to modifications required by any difference between actual field conditions and those shown by the details and dimensions on the contract plans. The Contractor will be paid at the unit price bid for the actual quantities of materials used or for the work performed, as indicated by the various items in the contract.

**NOTICE TO CONTRACTOR – WORK ON OR ABOVE FIRSTLIGHT
HYDRO GENERATING COMPANY PROPERTY**

The Contractor is hereby notified that some of the work to be accomplished under this Contract is to be performed on or above property owned by FirstLight Hydro Generating Company (FirstLight). A written agreement is in place between the Connecticut Department of Transportation and FirstLight which grants the reasonable use of the property to reconstruct the bridge and associated drainage ways as defined on the Exhibits A and B attached hereto.

Prior to any work on or access to FirstLight property, the Contractor shall enter into a Temporary License Agreement with FirstLight. A condition of this agreement will be that the Contractor shall except any and all liability for damages due to flooding, backwatering, woody debris and ice jams resulting from the placement of pilings, barges, or other activities in the waterway. There is a fee for this agreement if the Contractor requests uses of the FirstLight property that are beyond the permitted uses defined in the License Agreement. Refer to the attached “License Agreement” sample. The Contractor shall not commence construction activities on FirstLight property until the Temporary License Agreement is fully executed. The agreement and related correspondence should be directed to:

FirstLight Hydro Generating Company
Attention: Stuart Piermarini
P.O. Box 5002
New Milford, CT 06776

In addition to entering into a Temporary License Agreement, the Contractor shall add FirstLight as “additional insured” to the liability insurance policy.

NOTICE TO CONTRACTOR – WORK WITHIN CHANNEL

Prior to starting in-water work, coordination with the US Coast Guard and CTDEEP Boating Division must be performed. The Contractor shall submit a Boat Safety Plan to the Engineer at least 90 days prior to in-water work commencing so that this coordination can be completed. Written approval of the Boat Safety Plan is required before starting in-water work.

Prior to closing the channel completely to boat traffic, coordination with CTDEEP Boating and the Lake Zoar Authority must be performed. The Contractor shall submit a Closure Plan, which will specify the dates that the channel will be closed, locations of additional beacons needed to close the channel, and proposed public outreach to notify boaters at nearby marinas and boat launches of the channel closure, to the Engineer a minimum of 30 days prior to the establishment of the channel closure. Written permission from the Engineer is required before initiating the channel closure.

The Contractor shall also refer to the special provisions for Section 1.08 Prosecution and Progress and Item #1018013A “Temporary Waterway Construction Markers” as well as the applicable permits for additional requirements.

NOTICE TO CONTRACTOR - ENVIRONMENTAL INVESTIGATIONS

An environmental site investigation has been conducted that involved the sampling and laboratory analysis of soil and sediment collected from various locations and depths within the project limits. The results of this investigation indicated the presence of polynuclear aromatic hydrocarbons (PAH) at concentrations exceeding the applicable Connecticut Department of Energy and Environmental Protection (DEEP) Remediation Standard Regulations (RSRs) in the soils within the project limits. In addition, low-level concentrations of extractable total petroleum hydrocarbons (ETPH) and PAHs were detected in soil and sediment at concentrations below the applicable DEEP RSR criteria. The testing results in this report indicate levels of various contaminants that the Contractor may encounter during construction. Actual levels found during construction may vary and such variations will not be considered a change in condition.

Based on these findings, the entire project has been designated as an Area of Environmental Concern (AOEC) for soil. The AOEC is limited to soil located at the surface and extending to eight (8) feet below current grade. AOEC soil is to be reused within the project limits so that no excess contaminated soil is generated for off-site disposal.

In addition, all sediment within the project limits has been designated as a sediment “Low Level” Area of Environmental Concern (SED-LLAOEC), where the compounds detected were at concentrations below the numeric criteria. The presence of the compounds at these concentrations will not require material handling measures beyond those required for normal construction operations. Material excavated from within the SED-LLAOEC cannot be reused within the project limits and shall be directly transported to the Waste Stockpile Area (WSA) for waste characterization and off-site disposal at an approved treatment/disposal facility in accordance with Item No. 0020763A – Disposal of Sediments.

Material removed from catch basins within the project limits will be brought to the existing project WSA or as directed by the Engineer for waste characterizations and offsite disposal.

The DEEP groundwater classification beneath the site is GA. Groundwater was not encountered during the environmental investigation and therefore no groundwater samples were collected and analyzed. Dewatering fluids encountered during construction activities should be managed and discharged in accordance with the construction dewatering permit for the project. However, if contamination is encountered during dewatering activities, controlled management and disposal of contaminated groundwater in accordance with DEEP permits may be required.

The Contractor is hereby notified that controlled materials requiring special management or disposal procedures may be encountered during construction activities conducted within the project limits. Therefore, the Contractor will be required to implement appropriate health and safety measures for all construction activities to be performed within the AOEC and SED-LLAOEC. These measures shall include, but are not limited to, air monitoring, engineering controls, personal protective equipment and decontamination, equipment decontamination and

personnel training. WORKER HEALTH AND SAFETY PROTOCOLS WHICH ADDRESS POTENTIAL AND/OR ACTUAL RISK OF EXPOSURE TO SITE SPECIFIC HAZARDS IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.

All suitable material excavated within the AOEC shall be utilized as fill/backfill within the originating AOEC in accordance with the following conditions: (1) such soil is deemed to be structurally suitable for use as fill by the Engineer; (2) such soil is not placed below the water table; (3) the DEEP groundwater classification of the area where the soil is to be reused as fill does not preclude such reuse; and (4) such soil is not placed in an area subject to erosion. Material within the AOEC is to be reused on-site prior to use of other soils and/or fill such that no excess materials requiring off-site disposal are generated from the AOEC.

Material excavated from within the SED-LLAOEC cannot be reused within the project limits and shall be directly transported to the Waste Stockpile Area (WSA) for waste characterization and off-site disposal at an approved treatment/disposal facility.

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

- Item No. 0020762A – Sediment Handling
- Item No. 0020763A – Disposal of Sediments
- Item No. 0101000A – Environmental Health and Safety
- Item No. 0101128A – Securing, Construction and Dismantling of a Waste Stockpile Treatment Area
- Item No. 0101130A – Environmental Work - Solidification

The Contractor is alerted to the fact that the Department's environmental consultant will be on site for excavation activities within the AOEC and SED-LLAOEC to collect sediment/soil samples (if necessary) and to observe site conditions for the Department. **The WSA shown on the plans and is to be used exclusively for temporary stockpiling of excavated controlled materials from within project limits for determination of disposal classification. Access to the WSA may be limited.**

Information pertaining to the environmental investigation discussed can be found in the document listed below. These documents shall be available for review electronically at the Office of Contracts, 2800 Berlin Turnpike, Newington, Connecticut.

- Task 910 – Regulatory Compliance. Bridges #01218 & #04180 Over Housatonic River, Newtown/Southbury, Connecticut, DTC, Inc. November 2018.

NOTICE TO CONTRACTOR – USE OF STATE POLICE OFFICERS

The Department will reimburse services of State Police Officers as a direct payment to the Department of Emergency Services and Public Protection. Payment for State Police Officers must be approved by the Engineer. Any State Police Officers used by the Contractor for its convenience is the responsibility of the Contractor. A separate payment item for State Police Officers is not included in this Contract.

Any costs associated with coordination and scheduling of State Police Officers shall be included in the lump sum bid price for Item No. 0971001A – Maintenance and Protection of Traffic.

**NOTICE TO CONTRACTOR – CAS CERTIFICATION FOR ABRASIVE
BLAST CLEANING AND COATING WORK**

This Contract requires abrasive blast cleaning and coating work be done with at least one (1) Coating Application Specialist per four (4) craft-workers. Coating Application Specialist (CAS) certification is available through the Society for Protective Coatings (SSPC). The CAS program is based on the requirements of SSPC ACS-1/NACE 13, a standard published jointly in 2008 by SSPC and NACE International (National Association of Corrosion Engineers). ACS-1 defines training and experience requirements that tradespersons must have in order to qualify to be assessed for certification. CAS QP-1 implementation requires that the CAS Level II certified applicator be on the job during abrasive blast cleaning and painting operations.

The firm proposed to perform abrasive field blast cleaning and coating on this Project must meet the requirements outlined in the special provisions under “Contractor - Subcontractor Qualifications.”

When applicable, the shop painting firm proposed to perform abrasive blast cleaning and shop painting on this Project must meet the requirements outlined in the special provisions under “Qualifications of Shop Painting Firm.”

NOTICE TO CONTRACTOR – GEOTECHNICAL REPORT

Please be advised that during the design phase, a subsurface investigation was conducted at this site for the proposed temporary access roads. Using the results of the subsurface investigation and historic boring logs, a geotechnical report was prepared which presents geotechnical considerations for use by the Contractor's engineer in the design of the temporary access roads and work trestles. If you would like a copy of this report, please contact DOTContracts@ct.gov.

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 **Work Classification No. 10**, to be eligible to bid on this project. Bidders that are not prequalified for this work classification will not be approved to bid on this project.

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

Replace the third sentence of the last paragraph with:

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

Contractor Prequalification Work Classifications

Group No. 1 Site Work

Clearing, grubbing, removal of tree stumps, shrubs, site preparation, grading of a site, silt fence barrier, gabions, erosion control, rock crushing/recycling, screening topsoil and other aggregates.

Group No. 2 Utility work

Sewer and water mains, pipe jacking, storm drainage systems, sewer rehabilitation, sewage pumping stations, pressurized lines, etc.

Group No. 3 Concrete Restoration

Cement Concrete Curb, sidewalks, steps, ramps, low retaining walls under 3-foot clear face, spillways, driveways, monument cases and covers, right-of-way markers, slabs & footings. Barriers, concrete barriers. Cement concrete repair. Concrete structures except bridges: cast-in-place median barrier, footings, prefabricated panels and walls, retaining walls, and ramps, foundations, and concrete slope protection.

Group No. 4 Specialized Concrete Repair

Epoxy coatings, epoxy repair, masonry repair, masonry cleaning, special coatings, epoxy injection, gunite repair, and pressure grouting.

Group No. 5 Paving and Associated Construction - Limited Access Highways/Freeways

General Paving; Bituminous and Portland cement concrete paving. Pavement Rehabilitation; chip seal and related work. Placing crushed surfacing materials and gravel, Asphalt paving, placing of hot bituminous pavement and/or replacement. Concrete Paving; placing Portland cement concrete pavement. Placing of crushed materials with asphaltic application.

Associated pavement work; rubblizing, reclamation, rigid base course, flexible base course, bituminous pavement, bituminous pavement patching & repair, bituminous joint & crack sealing, milling, rumble strips, bituminous surface treatments, seal coats, rigid pavement, rigid pavement patching & repair, diamond carbide grinding, spall repair, sawing & sealing concrete or bituminous, roadway.

Group 5 Limitations

Group No. 5A Rumble Strips

Group No. 5B Parking Lots and Paved Trails

**Group No. 5C Limited to Group No. 6 Resurfacing and Preservation:
Local Roads & Streets and Non-Freeways Projects**

**Group No. 6 Road Construction and Rehabilitation: Local Roads &
Streets and non-freeways**

Rehabilitation is work proposed to improve service ability and extend the service life of existing roadways and streets and to enhance safety. Work, usually accomplished within the existing right of way. Work may include the upgrading of geometric features; such as roadway widening, minor horizontal re-alignment and to accommodate the approach roadway width. Resurfacing, restoration & rehabilitation work on non-freeways, which include mill & resurface, bridge approach work, concrete joint repair, safety upgrades, shoulder widening, shoulder paving or other work along existing alignment within the existing ROW. Examples: Grading and Drainage: roadway excavation and embankment, modification of ground surface by cuts & fills, alignments, grading, profiles, cross-sections, excavating of earth materials and the placement of drainage structures, minor widening reconstruction, structure excavation, general site development.

**Group No. 7 Road Construction and Rehabilitation: Limited Access
Highways/Freeways**

Limited access freeways with enclosed drainage, grade separations, urban and freeway-to-freeway interchanges, service roads, retaining walls, noise walls etc. The proposed work on the approximate alignment of an existing route that meets the geometric criteria for a new facility. The work may include geometric improvements, drainage improvements, revised horizontal and vertical alignments, utility conflicts, ROW acquisition and complex staging up to and including full roadway construction/reconstruction on new alignment. Rehabilitation of existing main lanes, structures, construction of HOV lanes, new interchanges, new rest areas and noise walls, and installation, rehabilitation, etc. of signs, pavement markings, striping, etc. on freeways. Installation of specialty walls/slopes: counterfort walls, mechanically stabilized earth, stabilized slopes, soil nailing. Drilling & Blasting, Anchors, drilling, Permanent Tie-Back Anchor, installation of permanent rock and soil anchors, soldier piles and timber lagging. Soldier pile tie-back anchor wall construction. Pile-driving, driving concrete, steel, and timber piles. Cofferdam & pumping. Tunnels and construction of underground conduit without the continuous disturbance of ground surface.

Group 7 Limitation

Group No. 7A Limited to Major Reconstruction of Non-Freeway State Routes

Non-freeways in developed areas impacting multiple stakeholders, with multiple underground and overhead utilities, and potentially constructed over multiple seasons. It may also include major reconstruction on rural State routes. Major work may include full depth reconstruction, substantial changes in the general geometric character of the roadway, such as widening, horizontal or vertical re-alignment, slope cuts or fills, etc. Installation /relocation of utilities, pavement resurfacing and reclamation projects in rural and suburban areas with grade separations, and major intersection realignments.

The work may also include major drainage improvements, watermain and sewer main work, utility conflicts, ROW acquisition and complex staging up to and including full roadway construction/reconstruction. Rehabilitation of existing main lanes and structures, installation of signs, pavement markings, etc. Installation of retaining walls and specialty walls/slopes such as GRS-IBS walls / structures, mechanically stabilized earth, stabilized slopes, soil nailing. Drilling & blasting, anchors, permanent Tie-Back anchor, installation of permanent rock and soil anchors, soldier piles and timber lagging. Pile-driving, driving concrete, steel, and timber piles. Cofferdam & pumping, handling of controlled groundwater and materials. Construction of underground conduit without the continuous disturbance of ground surface.

Group No. 8 Minor Bridges

Minor Bridges are bridges with spans lengths not exceeding 50 feet (center to center of cap) and total length not exceeding 200 feet. A Minor Bridge shall not contain any type of construction listed under Intermediate Bridges or Major Bridges.

Construction and Rehabilitation of Minor Highway, Railroad, and pedestrian bridges and work incidental thereto. Examples: concrete box culverts, precast concrete beam bridges, single span steel beam bridges, pedestrian bridges, timber bridges. Rebar installation, concrete placement, erection of steel / precast concrete / timber members, bridge removal / demolition, minor deck or substructure repairs, bearing devices, expansion devices, shoring & sheeting, pile driving, bridge rail.

Group 8 Limitations

Group No. 8A Box Culverts

Group No. 8B Pipe Culverts/Culvert Linings

Group No. 8C Pedestrian and/or Timber Bridges

Group No. 9 Intermediate Bridges

Intermediate bridges are bridges with span lengths exceeding 50 feet (center to center of cap) or those including continuous spans or on a limited access highway and contain none of the types of construction listed under Major Bridges.

Construction and Rehabilitation of Intermediate Highway, Railroad and pedestrian bridges and work incidental thereto. Examples; Bridges which include curved steel girders, precast concrete beam bridges, steel beam bridges, pedestrian bridges, timber bridges. Rebar installation, placement of concrete, erection of steel /prestressed concrete / timber members, bridge removal / demolition, deck or substructure repairs. Bearing devices, expansion devices, shoring & sheeting, pile driving, bridge rail.

Group No. 10 Major Bridges

Bridges which includes bascule, lift, or swing spans
Bridges which include drilled shafts larger than 30" in diameter
Bridges with multi-level roadways
Bridges of concrete segmental construction
Bridges which include steel truss construction
Bridges which include cable stayed construction
Bridges of conventional construction which are over a water opening of 500 feet or more
Cast-in-place post-tensioned superstructures.
Bridges which include long spans over 200 feet
Spliced concrete girders
Steel box girders.

Construction and Rehabilitation of Major Highway, Railroad and pedestrian bridges and work incidental thereto. Examples: Rebar installation, placement of concrete, erection of steel / prestressed concrete / timber members, bridge removal / demolition, deck or substructure repairs, bearing devices, expansion devices, shoring & sheeting, pile driving, bridge rail.

Group No. 11 Bridge Painting

Painting, blast cleaning & coatings. SSPC certificates required.
Priming, surface preparation, application of finish coats, containment and disposal.

Group No. 12 Marine Repairs, Marine Construction or Salvaging

Riprap and Rock Walls: mortar, rubble, and masonry walls, rock retaining walls, and placing of large broken stone on earth surfaces for protection against the action of water. Drainage channels, erosion protection, drainage spillways & ancillary structures, docks, breakwaters, harbor structures & roadway systems, underwater construction, underwater utilities. Pile driving or extraction; construction, repair and demolition of piers and wharfs; dredging; bulkheads and jetties; and work incidental thereto. Dredging. Construction & repair of timber, concrete and steel bulkheads, fender systems, and dolphins.

Group No. 13 Traffic Control & Illumination/Electrical

Installation, removal & modification of traffic signals or traffic signals related equipment, including traffic signal support structures and foundations and other construction incidental thereto. Installation, removal & modification of highway illumination, navigational lighting, airfield lighting, airfield guidance, obstruction lighting, and movable bridge systems and equipment, including light standards, foundations, conduits, duct banks, handholes, junction boxes, cables, power distribution and control cabinets w/foundations, wiring connections and miscellaneous electrical apparatus associated with each system.

Group No. 14 Signing

Installation, removal & modification of extruded aluminum signs, sheet aluminum signs, delineators, and sign supports. Sign supports include but are not limited to monotube bridge sign structures, 4 chord truss bridge sign structures, 4 chord truss cantilever sign structures, structure mounted sign supports, overhead truss sign support foundations, drilled shaft traffic structure foundations, structural steel for side mounted sign supports, side mounted sign foundations, and metal sign posts not requiring foundations.

Group 14 Limitation

Group No. 14A Installation, removal & modification of sheet aluminum signs and delineators on metal sign posts not requiring foundations.

Group No. 15 Intelligent Transportation Systems (ITS)

Traffic monitoring stations (Installation of piezo sensors, loop detectors, conduits, conductors, cable, handholes, junction boxes, service and control cabinets, foundations, power and telephone /communications), Camera monitoring systems (CCTV), Traffic Flow monitors, Highway Advisory Radios, Systems (HAR), Dynamic Message Signs (DMS), Integrated Communication Systems, Environmental sensing stations, Variable message signs, Computerized Traffic Signal Systems (CTSS). Design and installation of fiber optic based communication systems.

Group No. 16 Pavement Markings

Epoxy resin and thermoplastic markings, stripes, bars, letters, symbols, etc., traffic buttons, lane markers, guide posts. Pavement markings; includes delineators, traffic stripe painting and painted, epoxy resin, and/or thermoplastic pavement markings. Pavement Markings for highways, streets, airports and parking lots.

Group No. 17 Incidental Construction: Fencing

Standard highway fencing (wire, chain link, etc.) noise barrier fences; delineation.

Group No. 18 Incidental Construction: Guide Rail and Impact Systems

Construction of a rail secured to uprights and erected as a barrier between, or beside lanes of a highway. Standard guide rail, bridge rail, impact attenuator, steel median barrier. Traffic

Accommodations & Control: Impact attenuators, installation of approved protective systems filled with sand, water, foam, or other substances which prevent errant vehicles from impacting roadside hazards.

Group No. 19 Bridge Preservation and/or Preventive Maintenance; this class is for work associated with extending the service life of existing bridge structures and may include any of the following:

- Group No. 19A Bridge Joint/membrane Repairs; repair/rehabilitation/replacement of bridge joint systems and repair/replacement of bridge deck protective systems (membrane & bituminous wearing surface)**
- Group No. 19B Steel Repairs; repairs to steel superstructure and/or substructure elements, furnishing, fabricating, erection and shop painting of structural members.**

Repairs and/or Replacement of Bridge Bearings; repairs and/or replacement of bridge bearings including pier and abutment seat modifications.

Bridge Painting; localized paint removal and painting of beams and cap girders.

- Group No. 19C Concrete Repairs; repairs to concrete superstructure and/or substructure elements; application of protective coatings, crack repair, patching of decks and variable depth patching.**
- Group No. 19D Scour Countermeasures; installation of scour mitigation measures.**

Timber Repairs; repairs to timber decks and or superstructure and/or substructure elements.
Protective Fencing and Rail Systems Repairs; repair/upgrade of bridge rail and safety elements.
Bridge Deck Drains; Cleaning of existing drain systems including scupper and weeps;
repair/rehabilitation/replacement of deck drain systems.

Group No. 20 VACANT

Group No. 21 Railroad Construction

Construction of railroad sub grade, placing of ballast, ties and track, at grade crossings and other items related to railroad work.

Group No. 22 Railroad Construction Electrical

Construction of overhead Catenaries, substations, switches, and signals.

Group No. 23 Landscaping/Environmental Improvements

Roadside: Landscaping roadside, including seeding, hydro seeding, mulching, sodding, and ground cover planting, topsoil application, and other construction related thereto.

Site Landscaping: topsoil application, including planting of trees, shrubs and all ground covers on various types of sites, selective tree removal, trimming, seeding, insecticide application, weed control, liming, soil binder & soil supplements, irrigation. Wetland mitigation, creation, plantings and removal of invasive species.

Group No. 24 Environmental

Environmental/Hazardous waste removal and stockpile. Containment, cleanup, removal and disposal of debris and hazardous, controlled/toxic materials.

Group No. 25 Vertical Construction

Group No. 25A Vertical Construction - Minor

The undertaking of general contracts for the construction of buildings (i.e. new construction, renovation, rehabilitation, alteration, addition, etc.). The work includes a variety of construction practices, requires some coordination of subcontractors and utilities, requires basic equipment, and tends to have short, one season (spring - fall) construction durations. Includes those designs that are conventional in character, require minimum design based on pre-engineered components/systems, and that pose minimum effort by the design professional. Examples include basic building structures without interior finishes, small renovations, minor ADA compliance upgrades, salt sheds, small maintenance facilities, small train station renovations, warehouses, ceiling replacement, pre-engineered components, recreation facilities, etc.

Note: If you are prequalified for General Building Construction under Group 25B and/or Group 25C, you are automatically prequalified for Group 25A.

Group No. 25B Vertical Construction - Intermediate

The undertaking of general contracts for the construction of buildings (i.e. new construction, renovation, rehabilitation, alteration, addition, etc.). The contract must include a variety of construction practices, major coordination of subcontractors and utilities. May require specialized equipment and / or trades, and may have multiple year construction durations. Includes most of the structures that normally have occupied spaces. These all require normal mechanical/electrical systems for today's standards of operation for quality space, security and environmental comfort. Examples include larger Maintenance facilities, train station projects, parking garages, major renovations, multiple site work / renovation coordination, office buildings, general classroom and administrative offices, college buildings, auditoriums and maintenance buildings, bus maintenance and storage facilities.

Note: If you are prequalified for General Building Construction under Group 25B, you are automatically prequalified for Group 25A.

Group No. 25C Vertical Construction - Major

The undertaking of general contracts for the construction of buildings (i.e. new construction, renovation, rehabilitation, alteration, addition, etc.). The contract must include a variety of construction practices, major coordination of subcontractors, tenants, operations, and public in occupied areas, requires integrated scientific or complex mechanical/electrical equipment in order for them to function, and are typically multiple year construction durations. Examples include hospitals, chemistry buildings, historic preservation to a landmark structure, and/or any other structure that is truly one of a kind within the State's inventory. Other examples include threshold buildings, airport buildings / terminals, marine structures, train maintenance buildings and train stations, parking garages.

Note: If you are prequalified for General Building Construction under Group 25C, you are automatically prequalified for Group 25A and Group 25B. There may be specific projects within this classification that require a major contractor registration from the Department of Consumer Protection.

Group No. 25E Vertical Construction Electrical

General building electrical, generators, electrical vaults, lighting, and associated finishes.

Group No. 25R Vertical Construction Roofing

General building roofing, thermal/moisture protection and associated finishes.

GUIDANCE DOCUMENT

Assignment of Prequalification Work Classifications

Objective

To validate and assign the appropriate Prequalification Work Classification (Work Classification) to projects during final design, to incorporate the assigned Work Classification into the contract documents through a Special Provision, and to include the assigned work classification in the Bid Invitation For Advertisement.

Benefits

- Improves the efficiency of the overall bidding and award process
- Provides for more accurate Work Classifications resulting from collaboration between the lead designer and District Construction.
- Results in a more timely and efficient process of approving prequalified contractors to bid on projects.
 - Contractors will know ahead of time what Work Classifications they need to be prequalified in order to be awarded the contract
 - In the event contractors aren't prequalified in the project's assigned Work Classification, they can attempt to obtain the new prequalification Work Classification earlier in the advertising process
- Improved Bid Proposal Request and review process.
 - If contractors disagree with the projects assigned Work Classification, the discussion and review will take place early and prior to approval to bid on a project.
 - Eliminates the current process where the Contracts Unit requests support information such as the percentage breakdown of the types of work, the defined scope of work, and contract value to ensure the appropriate Work Classification was assigned to the project.
- Minimizes post bid challenges/protests related to contractor prequalifications.

Background

A project's Work Classification describes the essence/type of work that a Contractor must be prequalified in order to bid, and be considered for award of a project. The process of prequalifying contractors for various Work Classifications provides some level of assurance to the Department of Transportation that the Contractor will be successful in completing the construction of the project.

District Construction's input is valuable in determining the Work Classification, as they have experience on what types of contractors may have interest to bid on the project based upon the scope of work as well as what part of the work is most critical to the on-time satisfactory completion of the work.

GUIDANCE DOCUMENT

May 29, 2019

Under the directive, the assigned Work Classification will be clearly indicated on the calendar day chart, identified in a Special Provision and will be included in Contract Development's (Processing) Transmittal memo at DCD. It is important for the Contracts Unit to have a general understanding of the scope of the project and to know that the assigned Work Classification was determined involving collaboration between the lead designer and District Construction. A collaborative approach in determining the Work Classification provides the Contracts Unit a better sense of the type of contractor(s) that may submit a request to bid on a particular project. This allows the Contracts Unit to efficiently review and approve/deny the contractor's [Bid Proposal Request Form](#) and ensures that the contractor is prequalified for the Work Classification associated with the project and that the contractor has the available bidding capacity to bid a particular project. Thus overall making for a more efficient post bid award process and mitigates bid protests/challenges after bid.

Although it may not eliminate contractors from asking, the assigned Work Classifications will have been vetted by appropriate parties within the department, which will improve and expedite the Department's response.

Guidance

Assigned Work Classification

The project's assigned Work Classification will be chosen from prequalification categories published by Contracts. However, the Lead Designer must first understand the project's essence of work/complexity, contract value, and percentage breakdown before recommending the prequalification category because the description of work and examples provided for each category cannot describe every type of work that may be encountered or considered. It should be used as a guide to promote productive discussions between Design and District Construction during the Work Classification determination process.

Determinations for classifications:

Some of the criteria that the Department needs to consider when assigning the Work Classification to projects are, the essence of work / complexity, contract value, and percentage breakdown of types of work. Other considerations that may be considered are Contract duration and how to maximize bid competition without excluding potential qualified bidders.

Essence of Work / Complexity:

The first step in obtaining an understanding of what the classification should be is to determine the essence, or core substance of the work, and how complex the work is. It's important to clarify what "type" of work is being performed and how the completion of that work affects the public. If the work's construction and completion is critical to and impacts public safety and service, then the projects Work Classification should align with that work. Some examples are:

Deck patching and joint replacement on a major bridge, depending on the extent of the work and volume of traffic, could be classified as Group 19 Bridge Joints/Membranes and Group 4 Specialized Concrete Repair, in lieu of Group 10 Major Bridge.

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A highway ramp signing project on a limited access highway may not justify Group 7 classification because its impact to the traveling public could be minor. This could be classified as Group 14 signing Steel repairs and painting located on a Group 10 Major Bridge may not justify classifying the project as a Group 10 Major Bridge, but may be classified instead as Group 11 Bridge Painting and Group 9 Intermediate Bridge rehabilitation.

It is important to understand the type of work and its complexity when choosing a work classification.

Contract Value

Contract value is usually one of the first criteria that comes in to question when discussing the appropriate project Work Classification. Although there is no set value system associated with the Work Classifications, Contract value is a good indicator of project size, complexity, and impact to the public. For example, a large contract value normally indicates multiple subcontractors that the Prime contractor will have to coordinate and schedule, day and night work, longer duration, or a large amount of work on bridge or roadway. Although the type of road or size of building or bridge may indicate a lower classification be assigned, the project's contract value with these other considerations may indicate that a higher classification is required to obtain the most qualified contractor to complete the project successfully. (Major roadway reconstruction on a state road may indicate that Group 7, Road Construction and Rehabilitation: Limited Access Highways, freeways, and major reconstruction of non-freeway state routes be assigned in lieu of Group 6.)

Percentage Breakdown of Type of Work

The types of work associated with the project is another important factor to consider when assigning the Work Classification. A percentage break down of the types of work the contract is often useful to assist in understanding the project scope and the type of contractor that may request to bid on the project. The project funding source is not a representation of the majority of the work or critical work element.

Types of work to consider on a specific project will obviously vary. Each project has its own unique set of characteristics and circumstances. Examples of types of work are, bridge/structure work, highway/roadway, paving, bridge painting, steel repair, maintenance/preservation work vs complete rehab/replacement work, building structure, earthwork/excavation, concrete, etc. To perform this calculation, the designer should review the estimated items of work and combine those that compromise the "majority" types of the work. For example, add together the contract item costs that are involved with the bridge work versus those that are considered roadway work. The larger, costlier items associated with the essence of the work, not every item, should be included in the calculation. General items (e.g. Mobilization and Demobilization, Maintenance and Protection of Traffic, etc.) and minor items should be excluded from the calculations.

Assigning Work Classifications

GUIDANCE DOCUMENT

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The Lead Designer will indicate the assigned Work Classification on the Calendar Day Chart (found on the [Highway Design](#) web page). Consideration of the assigned Work Classification should begin early in the final design stage of the project design. Collaboration and discussion regarding the appropriate Work Classification will occur between the Lead Designer and District Construction staff. The project “Plans in Hand Meeting” may present a good opportunity for this coordination and to make a determination. The resulting Work Classification determination will be listed on the project Calendar Day Chart. The Calendar Day Chart will have District Construction concurrence prior to PS&E submission at FDP. If the scope or essence of work changes, then the Calendar Day Chart must be revised to reflect the new Work Classification and re-signed by District Construction.

In most cases, a project should have one “primary” work classification assigned to it. Although, there may be scenarios where the Department may want to require prime contractors to be prequalified in more than one work classification, such as on a very large, complex bridge/highway project (i.e. Group 7 and 10). It also may be acceptable to allow a contractor to bid having either of two different Work Classifications, such as with a bridge rehab/painting project.

If multiple work classifications are recommended, *a separate meeting between Engineering, Construction, and the Contracts unit should be held*. This meeting will ensure that all parties are on board with the final determination and will eliminate delays during the bid and award process.

In general if a contract requires a minor amount of specialized work, a qualifications special provision is preferable to a work classification assignment. The work classification for the contract should address the majority of the work to be completed.

Contract Bid Documents

Contract Development (Processing) will review the assigned Work Classification indicated on the Calendar Day Chart in order to ensure the Work Classification is not precedent setting and is in conformance with assignments for that type of project. If Contract Development has any concerns, they will initiate communication with the Lead Designer and coordinate to work through a resolution. Changes to the previously determined Work Classification will require concurrence from District Construction by means of a revised Calendar Day Chart.

Contract Development (Processing) will prepare a Special Provision for Section 1.02 reflecting the appropriate Work Classification and include with contract documents for project bidding. The Special Provision shall be worded as:

“In accordance with the provisions of the Construction Contract Bidding and Award Manual, bidders must be prequalified for (Type Work classification here), 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.”

Contract Development (Processing) will include a line titled “Assigned Work Classification” in the Transmittal memo to the Contracts Unit. Contract Development will add the assigned Work Classification to the AASHTOWare Project Preconstruction system (i.e. Trns*port).

SECTION 1.03 - AWARD AND EXECUTION OF CONTRACT

Article 1.03.08 - Notice to Proceed and Commencement of Work:

Change the first paragraph to read as follows:

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

SECTION 1.05 - CONTROL OF THE WORK

Replace Article 1.05.02 with the following:

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

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

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

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

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

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

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

The Contractor’s designer, who prepares the working drawings, shall secure and maintain at no direct cost to the State a Professional Liability Insurance Policy for errors and omissions in the minimum amount of \$2,000,000 per error or omission. The Contractor’s designer may elect to obtain a policy containing a maximum \$250,000 deductible clause, but if the Contractor’s designer should obtain a policy containing such a clause, they shall be liable to the extent of at

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Subarticle 1.05.02 - (2) is supplemented by the following:

Illumination Items:

The packaged set of product data sheets, working drawings and/or shop drawings shall be submitted in an electronic portable document format (.pdf). All approvals or disapprovals and comments will be returned in one package.

The packaged set submitted in an electronic portable document format (.pdf) shall be in an individual file with appropriate bookmarks for each item. The electronic files for shop drawings shall be created on ANSI A (8 ½” x 11”; 216 mm x 279mm; letter) sheets.

Please send the pdf documents via email to: <mailto:jon.andrews@ct.gov>

Incident Management System Items:

When required by the contract documents or when ordered by the Engineer, the Contractor shall prepare and submit product data sheets, working drawings and/or shop drawings for all Incident Management System (IMS) related items to the Bureau of Highway Operations for approval before fabrication. IMS related items include multiduct conduit, pullboxes, fiber optic and communications cables, cabinets, cameras, camera lowering devices, variable message signs (VMS), traffic flow monitors (TFM) and telecommunications related equipment.

The packaged set of product data sheets, working drawings and/or shop drawings shall be submitted either in paper (hard copy) form or in an electronic portable document format (.pdf). The package submitted in paper form shall include one (1) set. Product data sheets shall be printed on ANSI A (8 ½” x 11”; 216 mm x 279mm; letter) sheets. Working drawings and shop drawings shall be printed on ANSI B (11” x 17”; 279 mm x 432 mm; ledger/tabloid) sheets.

Please mail to:

Mr. John F. Korte
Connecticut Department of Transportation
Bureau of Highway Operations
2800 Berlin Turnpike
P.O. Box 317546
Newington, Connecticut 06131-7546

Please send the pdf documents via email to: <mailto:john.Korte@ct.gov>

SECTION 1.06 - CONTROL OF MATERIALS

Article 1.06.01 - Source of Supply and Quality:

Add the following:

Illumination Items:

For the following materials the Contractor shall submit a complete description of the item consisting of the latest manufacturer shop drawing(s) which completely illustrates the material presented for formal approval. The submitted shop drawing(s) shall clearly call-out all material and operational properties for the item specific to the project. Such approval shall not change the requirements for a certified test report and materials certificate as may be called for.

Light Standards	Precast Foundation
Conductors	Service Items
Luminaires	Temporary Illumination Unit
Conduit	Aerial Cable
Cable in Duct	Handhole
Fuses and Fuse Holders	Junction Box
Navigation Lights	

Required shop drawings for all items listed above shall be submitted in one package at the same time. Please note: the list of items above is a “general” list of items. Certain items listed may or may not be present in a specific project. Please consult the Detailed Estimate sheet for project specific items.

Incident Management System Items:

For the following items required for the Incident Management System, the Contractor shall submit a complete description of the item, together with either in paper (hard copy) form or in an electronic portable document format (.pdf) one (1) copy of shop drawings, product data sheets and other descriptive literature which completely illustrates such items presented for formal approval. Such approval shall not change the requirements for a certified test report, and materials certificate as may be called for.

Approval of the Shop Drawings and product data sheets shall not change the requirements for a certified test report, materials certificate and certificate of compliance as may be called for.

Shop drawings shall be submitted on 8-1/2 inch by 11 inch sheets, 11 inch by 17 inch sheets or on 24 inch by 36 inch standard plan sheets. Shop drawings and data sheets shall be required for, but not limited to the following

Structural supports	Camera power supply
Hand holes and covers	Traffic Flow Monitors
Pullboxes and pullbox covers	Cast Iron Handhole Cover
Fiber Optic Modems	Cast Iron Junction Box

Fiberglass Junction Box	Fiber Optic Splice Enclosures
Traffic Management System Cabinets	Optical Fiber Termination Patch Panels
Traffic Management System Mini-hub Cabinets	Optical Video/Data Transmitter
Auxiliary Termination Cabinets	Optical Video/Data Receiver
Transformers	Network Customer Service Unit
Steel CCTV Poles	Video encoders and de-coders
Camera Lowering Device Assembly	Surge Panels
Remote Control Flashing Lights	Ethernet switch
Service Cabinets	Ethernet Port Sharing Device
Meter Sockets	Cat 6 Cable
Conductors	CCTV Coax Cable
Fiber Optic Cable	Coax Cable Connectors
Fiber Patch Cords	CCTV Twisted Pair cable
Fiber Optic Connectors	CCTV Twisted pair connectors
Surface Mounted Conduit and Appurtenances	RJ 45 and RJ 48 Connectors
Conduit, pulling tape, supports, brackets, hangers, clamps and any hardware involved with the supports and including complete fabrication details.	
Field fastener details including chemical and mechanical anchors	
Camera Assembly. Schematics of the wiring between the camera and the equipment cabinet shall also be provided.	
Camera Video Cables, Data Cables, Power Cables and Connectors	
Modify Existing Operations Center Control System including all materials, schematics, diagrams and drawings.	
Motorists Aid Variable Message Signs, cabinets, cables, diagrams, schematics etc.	

Article 1.06.05 - Shipping Materials: Add the following:

Incident Management System Items:

All vehicles transporting materials on highways and bridges in the State shall comply with all the vehicle regulations of the Connecticut General Statutes and regulations of Connecticut State Agencies as they apply to vehicle length, width, height and weight.

Any vehicle, either loaded or unloaded, will not be allowed to travel across any bridge or on any highway when such vehicle exceeds the legal limits or posted limits of such bridge or highway without a permit. The owner of the vehicle must apply to the Department for a permit for such travel, as provided in the statutes.

The General Statutes include the following limitations:

Vehicle Width (Section 14-262(a)(1)) - The width of a vehicle and combination vehicle and trailer, including its load, is limited to 8.5 ft. (2,590 mm), without a permit.

Vehicle Length (Section 14-262(c)) - The length of the semitrailer portion of a tractor-trailer unit, including its load, is limited to 48 ft. (14,630 mm), without a permit.

Vehicle Height (Section 14-264) - The height of a vehicle, with its load, is limited to 13.5 ft. (4,110 mm), without a permit.

Vehicle Weight (Section 14-267a(b)(7)) - The gross vehicle weight (weight of vehicle including its load) is limited to 80,000 lbs. (36,280 kg) on 5 axles for vehicles with a 51 ft. (15,540 mm) wheelbase, without a permit.

Axle Weights of Vehicles (Section 14-267a) – For the above five axle vehicle, weight on a single axle may not exceed 22,400 lbs. (10,160 kg) or in the case of axles spaced less than 6 ft. (1,828 mm) apart, 18,000 lbs. (8,160 kg).

On Department projects, in accordance with the Commissioner’s policy, any member or component, either temporary or permanent, that measures 120 ft. (36,570 mm) or less and weighs no greater than 120,000 lbs. (54,430 kg), is transportable via an authorized permit route established by the Department provided the individual axle weights on the vehicle and trailer transporting the member or component do not exceed 20,000 lbs. (9,070 kg).

Members and components, shown in the contract documents, that exceed the above length and weight limits have been reviewed by the Department’s Oversize and Overweight Permits Section and are transportable via an authorized permit route established by the Department provided the individual axle weights on the vehicle and trailer transporting the member or component do not exceed 20,000 lbs. (9,070 kg).

All permits to transport materials are subject to shipping times established by the Department’s Oversize and Overweight Permits Section.

Applications for permits, required to transport materials, shall be submitted a minimum of two weeks prior to their required use, to the Department’s Oversize and Overweight Permits Sections.

Article 1.06.07 - Certified Test Reports and Materials Certificate.

Add the following:

Illumination Items:

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

Chemical Anchors
Conduit

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

Chemical Anchors
Conductors

Conductors

Incident Management System (IMS) Items:

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

Structural Steel (Poles and Sign Supports)	Rigid Metal Conduit
Structural Tubing	Anchor Bolts
Galvanizing (certifying compliance with ASTM)	Conduit hangers, supports, clamps
Zinc Rich Primer	Handholes
Neoprene Gasket	Cast Iron Junction Box
Polyurethane Sealant	Pull Box
Grounding Rods	Pull Box Cover
Copper Wire	Lowering Device Assembly
	Fiber Optic Cable
	Fiber Optic Cable Connectors

- 2) For the materials in the following Incident Management System items, a Certified Test Report will be required confirming their conformance to the requirements set forth in these plans or specifications or both.

Anchor Bolt and Hardware	Service Cabinet
Structural Steel (Poles and Sign Supports)	Transformer
Structural Tubing	Camera Cables
Welds	Structural Steel (Poles)
Conduit	Fiber Optic Cable
	Fiber Optic Cable Connectors

SECTION 1.08 - PROSECUTION AND PROGRESS

Article 1.08.04 – Limitations of Operations: Limitations of Operations is amended by the following:

TIME RESTRICTIONS

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

Interstate 84

On the following State observed Legal Holidays:

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

The following restrictions also apply:

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

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

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

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

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

During all other times

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

The Contractor will be allowed to halt Route I-84 traffic for a period not to exceed 10 minutes to perform necessary work for the removal of the existing bridge superstructure, the delivery, erection

and setting of structural steel, as approved by the Engineer, between 12:01 a.m. and 5:00 a.m. on all non-Holiday days.

Ramps and Turning Roadways

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

Housatonic River/ Lake Zoar

During construction of temporary work on Bridge Nos. 01218 and 04180, the Contractor shall abide by the following restrictions:

Between May 1st and October 1st, a minimum channel of 75' shall be maintained at all times, except as approved in writing by the Engineer. Channel closure may only be considered Monday – Friday during this period, no other times will be considered.

Between October 1st and May 1st channel may be closed with written permission of the Engineer and the submission and approval of a Channel Closure Plan.

All Other Roadways

The Contractor will not be allowed to perform any work which will interfere with the existing number of travel lanes including turning lanes in each direction between 6:00 a.m. to 9:00 a.m. and between 3:00 p.m. and 6:00 p.m. Monday through Friday and 10:00 a.m. to 9:00 p.m. Saturday and Sunday.

**Project No. 0096-0201
Limitation of Operations Chart
Minimum Number of Lanes to Remain Open**

Route: I-84 Eastbound Location: Bridge No. 01218 Number of Through Lanes: 2								Route: I-84 Westbound Location: Bridge No. 04180 Number of Through Lanes: 2							
Hour Beginning	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Hour Beginning	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Mid	1	1	1	1	1	1	1	Mid	1	1	1	1	1	1	1
1 AM	1	1	1	1	1	1	1	1 AM	1	1	1	1	1	1	1
2 AM	1	1	1	1	1	1	1	2 AM	1	1	1	1	1	1	1
3 AM	1	1	1	1	1	1	1	3 AM	1	1	1	1	1	1	1
4 AM	1	1	1	1	1	1	1	4 AM	1	1	1	1	1	1	1
5 AM	1	1	1	1	1	1	1	5 AM	1	1	1	1	1	1	1
6 AM	1	E	E	E	E	E	1	6 AM	1	E	E	E	E	E	1
7 AM	1	E	E	E	E	E	2	7 AM	1	E	E	E	E	E	2
8 AM	1	E	E	E	E	E	2	8 AM	1	E	E	E	E	E	2
9 AM	2	2	2	2	2	2	2	9 AM	2	2	2	2	2	2	2
10 AM	2	2	2	2	2	2	2	10 AM	2	2	2	2	2	2	2
11 AM	2	2	2	2	2	2	2	11 AM	2	2	2	2	2	2	2
Noon	2	2	2	2	2	2	2	Noon	2	2	2	2	2	2	2
1 PM	2	2	2	2	2	2	2	1 PM	2	2	2	2	2	2	2
2 PM	2	2	2	2	2	2	2	2 PM	2	2	2	2	2	2	2
3 PM	2	E	E	E	E	E	2	3 PM	2	E	E	E	E	E	2
4 PM	2	E	E	E	E	E	2	4 PM	2	E	E	E	E	E	2
5 PM	2	E	E	E	E	E	2	5 PM	2	E	E	E	E	E	2
6 PM	2	2	2	2	2	2	2	6 PM	2	2	2	2	2	2	2
7 PM	2	2	2	2	2	2	2	7 PM	2	1	1	1	2	2	1
8 PM	1	1	1	1	1	2	1	8 PM	2	1	1	1	1	1	1
9 PM	1	1	1	1	1	2	1	9 PM	1	1	1	1	1	1	1
10 PM	1	1	1	1	1	1	1	10 PM	1	1	1	1	1	1	1
11 PM	1	1	1	1	1	1	1	11 PM	1	1	1	1	1	1	1

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

'E' = maintain existing traffic operations = all available travel lanes, including exit only lanes, climbing lanes, and all available shoulder widths shall be open to traffic during this period

Additional Lane Closure Restrictions

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

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

SEQUENCE OF OPERATIONS

The Contractor shall conform to the Sequence of Operations listed herein and as shown on the Maintenance and Protection of Traffic Construction Plans or as directed by the Engineer. Work in any stage of the construction may commence only with prior establishment of the applicable provisions of the “Maintenance and Protection of Traffic” and prior approval of the Engineer.

STAGE 1

- **Interstate 84:**

Lane Configuration- Maintain two through lanes in each direction.

Construction Sequence

- Construct Temporary Haul Roads and Trestles
- Construct I-84 WB crossover within the existing median.
- Remove existing guiderails and other roadside appurtenances as necessary to accommodate crossover traffic.
- Install temporary precast concrete barrier curb as shown along I-84 EB to accommodate crossover traffic.

STAGE 2

- **Interstate 84:**

Lane Configuration- Maintain two through lanes in each direction.

Construction Sequence

- Close I-84 WB after moving traffic to the newly constructed crossover.
- Rehabilitate Bridge No. 04180 and approach roadways.

STAGE 3

- **Interstate 84:**

Lane Configuration- Maintain two through lanes in each direction.

Construction Sequence

- Shift WB traffic onto newly reconstructed Bridge No. 04180 and approach roadway sections.
- Modify the previously constructed WB Crossover to facilitate the I-84 EB crossover within the existing median.
- Modify the Site No. 1 temporary access road to accommodate the I-84 EB crossover.
- Remove existing guiderails and other roadside safety equipment as necessary to accommodate crossover traffic
- Install temporary precast concrete barrier curb as shown along I-84 WB to accommodate crossover traffic.

STAGE 4

- **Interstate 84:**

Lane Configuration- Maintain two through lanes in each direction.

Construction Sequence

- Close I-84 EB after moving traffic to the newly constructed crossover.
- Rehabilitate Bridge No. 01218 and approach roadways

STAGE 5

- **Interstate 84:**

Lane Configuration- Maintain two through lanes (I-84 EB) and two through lanes (I-84 WB).

Construction Sequence

- Shift EB traffic onto newly reconstructed Bridge No. 01218.
- Remove previously constructed EB Crossover.
- Remove temporary work trestles and access roads.
- Restore median area to pre-constructed conditions.
- Complete project closeout items.

At the end of Stage 4 and utilizing the Traffic Control Plans in the MPT specifications, install final pavement top course rumble strips, final pavement markings and signing.

Article 1.08.07 - Determination of Contract Time:

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

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

1.08.08 - Extension of Time:

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

Article 1.08.09 - Failure to Complete Work on Time:

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

SECTION 1.10 – ENVIRONMENTAL COMPLIANCE

Article 1.10.03 – Water Pollution Control: REQUIRED BEST MANAGEMENT PRACTICES

Add the following after Required Best Management Practice Number 13:

14. The Contractor is hereby notified that the State listed species of Special Concern eastern box turtle (*Terrapene carolina carolina*), is present within the Project limits. In Connecticut, this terrestrial turtle lives in a variety of habitats, including woodlands, field edges, thickets, marshes, bogs, and stream banks. Typically however, eastern box turtles are found in well-drained forest bottomlands and open deciduous forests. They will use wetland areas at various times during the season. During the hottest part of a summer day, they will wander to find springs and seepages where they can burrow into the moist soil. Eastern box turtles overwinter in upland forest, typically covered by leaf litter or woody debris. As temperatures drop, the turtles burrow down into soft ground.

All construction activities taking place within the Project limits will need to be coordinated with the Office of Environmental Planning (OEP) through the Engineer. At least 10 days prior to the commencement of any construction activities, the Contractor shall, through the Engineer, arrange for a CT DOT Environmental Inspector from the OEP or their authorized delegate to meet and discuss proper protocol for maintaining environmental commitments made for the protection of this species and habitat. OEP will provide oversight through the Engineer to ensure that the following protocols are followed and maintained during the course of the Project.

For any work done during the eastern box turtle's active period (April 1 to October 31) the Department will require the following precautionary measures to protect the eastern box turtle and eastern box turtle habitat:

- a. All areas within the Project limits must be surveyed and cleared of any turtles immediately prior to the commencement of initial clearing and grubbing activities.
- b. All construction personnel working within eastern box turtle habitat must be apprised of the species description and the possible presence of this listed species.
- c. Exclusionary practices will be required in order to prevent any eastern box turtle access to construction areas. These measures will need to be installed at the limits of disturbance as shown on the plans.
- d. Exclusionary fencing shall be at least 20" tall and must be secured to and remain in contact with the ground. It shall be regularly inspected / maintained to prevent any gaps or openings at ground level. Standard silt fence is adequate; fencing with netting shall not be used.

- e. The Contractor must search the work area each morning for the presence of this listed species prior to any work being done.
- f. Any eastern box turtles encountered within the immediate work area shall be carefully moved to an adjacent area outside of the excluded area and the Engineer shall be immediately informed in order to contact OEP with the location.
- g. All staging and storage areas in the vicinity of turtle habitat, outside of previously paved locations, regardless of the duration of time they will be utilized, must be reviewed by and receive written approval from OEP through the Engineer.
- h. No heavy machinery or vehicles may be parked in any unapproved eastern box turtle habitat.
- i. Exclusionary fencing shall be removed when it is no longer needed, and silt fence shall be removed as soon as the area is stable to allow for reptile and amphibian passage to resume.

Work may take place during the eastern box turtle's inactive (hibernation) period (November 1 to March 31) with the following additional precautionary measure:

- a. Exclusionary fencing must be installed and the area inspected for turtles by the Engineer or Engineer's approved representative prior to October 1.

These practices will be applied to the entire Project unless a sketch is attached, which identifies specific areas of concern.

This species is protected by State laws, which prohibit killing, harming, taking, or keeping them in your possession. Photographs and the laws protecting eastern box turtles shall be posted in the Contractor's and DOT field offices (species ID sheets will be provided by OEP).

- 15. The Contractor is hereby notified that the bald eagle (*Haliaeetus leucocephalus*) may be located within the vicinity of this Project. The bald eagle is a State threatened species and is also protected under both the Federal Bald and Golden Eagle Protection Act, and the Federal Migratory Bird Treaty Act. The bald eagle has adapted to life in urban settings and is becoming a common visitor in winter, particularly at favored locations along the Connecticut River, Housatonic River, and large lakes/reservoirs. In the winter, bald eagles may congregate into groups called communal winter roosts in order to conserve energy, take advantage of protective habitat, and be closer to food sources. The bald eagle is typically associated with large diameter trees (30 inch DBH or greater) for nest building and roosting purposes. Though somewhat tolerant of human activity, bald eagles can be negatively affected if work is too close to an active nest or winter roost. For this reason, special conditions regarding the location and timing of work around eagle usage areas must be adhered to.

In order to protect this species, construction activities will not be allowed to take place within 600 feet of a confirmed nest or winter roost as follows:

- Bald eagle nesting areas: Construction activities will not be allowed to take place within 600 feet of a confirmed nest between February 1st and August 1st.
- Winter roost areas: Construction activities will not be allowed to take place within 600 feet of a confirmed winter roost area between December 1st and March 31st.

Construction activities will be allowed within project areas that are outside the 600 foot buffer.

Additionally, the cutting of large trees (30 inch DBH or greater) shall be reviewed and approved by the Engineer in coordination with the Department's Office of Environmental Planning (OEP) staff. Any change in construction sequencing or timing of proposed work in the Project area, which might disturb bald eagles must be coordinated through the Engineer.

The time period and approximate areas of the Project expected to be subject to these restrictions based on the best available eagle activity information are attached. Prior to the start of work and during the Project, areas subject to these restrictions may be updated based on confirmed nest/winter roost information and shall be provided by the OEP. Exact locations of nests/winter roosts will not be provided in order to further protect the species.

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

2.86.01—Description

2.86.03—Construction Methods

2.86.04—Method of Measurement

2.86.05—Basis of Payment

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

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

Classifications:

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

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

2.86.03—Construction Methods:

(1) Drainage Trench Excavation Limits:

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

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

Vertical Limits: Trench depths shall extend vertically as follows:

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

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

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

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

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

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

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

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

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

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

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

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

2.86.04—Method of Measurement:

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

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

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

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

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

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

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

2.86.05—Basis of Payment:

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

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

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

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

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

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

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

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

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

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

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

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

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

SECTION 4.06 - BITUMINOUS CONCRETE

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

4.06.01—Description

4.06.02—Materials

4.06.03—Construction Methods

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

4.06.04—Method of Measurement

4.06.05—Basis of Payment

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

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

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

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

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

Density Lot: The total tonnage of all bituminous concrete placed in a single lift which are:

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

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

Disintegration: Erosion or fragmentation of the pavement surface which can be described as

polishing, weathering-oxidizing, scaling, spalling, raveling, or formation of potholes.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

4.06.03—Construction Methods

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

- a. State of Connecticut printed on ticket.
- b. Name of Producer, identification of Plant, and specific storage silo if used.
- c. Date and time.
- d. Mixture Designation, mix type and level. Curb mixtures for machine-placed curbing must state "curb mix only."

- e. If WMA Technology is used, “-W” must be listed following the mixture designation.
- f. Net weight of mixture loaded into the vehicle. (When RAP and/or RAS is used, the moisture content shall be excluded from mixture net weight.)
- g. Gross weight (equal to the net weight plus the tare weight or the loaded scale weight).
- h. Tare weight of vehicle (daily scale weight of the empty vehicle).
- i. Project number, purchase order number, name of Contractor (if Contractor other than Producer).
- j. Vehicle number - unique means of identification of vehicle.
- k. For Batch Plants: individual aggregate, recycled materials, and virgin asphalt max/target/min weights when silos are not used.
- l. For every mixture designation: the running daily and project total delivered and sequential load number.

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

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

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

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

Vehicles with loads of bituminous concrete being delivered to State projects must not exceed the statutory or permitted load limits referred to as gross vehicle weight (GVW). The Contractor shall furnish a list and allowable weights of all vehicles transporting mixture. The State reserves the right to check the gross and tare weight of any vehicle. If the gross or tare weight varies from that shown on the delivery ticket by more than 0.4%, the Engineer will recalculate the net weight. The Contractor shall correct the discrepancy to the satisfaction of the Engineer.

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

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

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

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

Refueling or cleaning of equipment is prohibited in any location on the Project where fuel or solvents might come in contact with paved areas or areas to be paved. Solvents used in cleaning mechanical equipment or hand tools shall be stored clear of areas paved or to be paved. Before any such equipment and tools are cleaned, they shall be moved off of areas paved or to be paved.

Pavers: Each paver shall have a receiving hopper with sufficient capacity to provide for a uniform spreading operation and a distribution system that places the mix uniformly, without segregation. The paver shall be equipped with and use a vibratory screed system with heaters or burners. The screed system shall be capable of producing a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture. Pavers with extendible screed units as part of the system shall have auger extensions and tunnel extenders as necessary. Automatic screed controls for grade and slope shall be used at all times unless otherwise authorized by the Engineer. The controls shall automatically adjust the screed to compensate for irregularities in the preceding course or existing base. The controls shall maintain the proper transverse slope and be readily adjustable, and shall operate from a fixed or moving reference such as a grade wire or floating beam (minimum length 20 feet).

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

Pneumatic tire rollers shall be equipped with wide-tread compaction tires capable of exerting an average contact pressure from 60 to 90 psi uniformly over the surface. The Contractor shall furnish documentation to the Engineer regarding tire size, pressure and loading to confirm that the proper contact pressure is being developed and that the loading and contact pressure are uniform for all wheels.

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

TABLE 4.06-1: Minimum Paver lighting

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

TABLE 4.06-2: Minimum Roller Lighting

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

*All fixtures shall be mounted above the roller.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

All temporary transitions shall meet the following length requirements:

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

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

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

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

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

Tack Coat Application: The tack coat shall be applied by a pressurized spray system that results in uniform overlapping coverage at an application rate of 0.03 to 0.05 gal./s.y. for a non-milled surface and an application rate of 0.05 to 0.07 gal./s.y. for a milled surface. For areas

where both milled and un-milled surfaces occur, the tack coat shall be an application rate of 0.03 to 0.05 gal /s.y. The Engineer must approve the equipment and the method of measurement prior to use. The material for tack coat shall be heated to 160°F ± 10°F and shall not be further diluted.

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

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

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

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

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

The mixture temperature will be verified by means of a probe or infrared type of thermometer. The placement temperature range shall be listed in the quality control plan (QCP) for placement and meet the requirements of Table M.04.03-4. Any HMA material that falls outside the specified temperature range as measured by a probe thermometer may be rejected.

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

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

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

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

TABLE 4.06-3: Thickness Tolerances

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

Where the thickness of the lift of mixture is less than that shown on the plans beyond the

tolerances shown in Table 4.06-3, the Contractor, with the approval of the Engineer, shall take corrective action in accordance with this Section.

- b) Area: Where the width of the lift exceeds that shown on the plans by more than the specified thickness, the Engineer will calculate the area adjustment in Article 4.06.04.
- c) Delivered Weight of Mixture: When the delivery ticket shows that the truck exceeds the allowable gross weight for the vehicle type, the Engineer will calculate the weight adjustment in accordance with Article 4.06.04.

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

Compaction: The Contractor shall compact the mixture to meet the density requirements as stated in Article 4.06.04 and eliminate all roller marks without displacement, shoving cracking, or aggregate breakage.

When placing a lift with a specified thickness less than 1 1/2 inches, or a wedge course, the Contractor shall provide a minimum rolling pattern as determined by the development of a compaction curve. The procedure to be used shall be documented in the Contractor's QCP for placement and demonstrated on the first day of placement.

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

If the Engineer determines that the use of compaction equipment in the dynamic mode may damage highway components, utilities or adjacent property, the Contractor shall provide alternate compaction equipment.

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

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

Surface Requirements:

Each lift of the surface course shall not vary more than 1/4 inch from a Contractor-supplied 10 foot straightedge. For all other lifts of bituminous concrete, the tolerance shall be 3/8 inch. Such tolerance will apply to all paved areas.

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

7. Longitudinal Joint Construction Methods: The Contractor shall use Method I - Notched Wedge Joint (see Figure 4.06-1) when constructing longitudinal joints where lift thicknesses are 1 1/2 inches to 3 inches. S1.0 mixtures shall be excluded from using Method I. Method II - Butt Joint (see Figure 4.06-2) shall be used for lifts less than 1 1/2 inches or greater than 3 inches. Each longitudinal joint shall maintain a consistent offset from the centerline of the roadway along its entire length. The difference in elevation between the two faces of any completed longitudinal joint shall not exceed 1/4 inch at any location.

Method I - Notched Wedge Joint:

A notched wedge joint shall be constructed as shown in Figure 4.06-1 using a device that is attached to the paver screed and is capable of independently adjusting the top and bottom vertical notches. The device shall have an integrated vibratory system. The top vertical notch must be located at the centerline or lane line in the final lift. The requirement for paving full width "curb to curb" as described in Method II may be waived if addressed in the QC plan and approved by

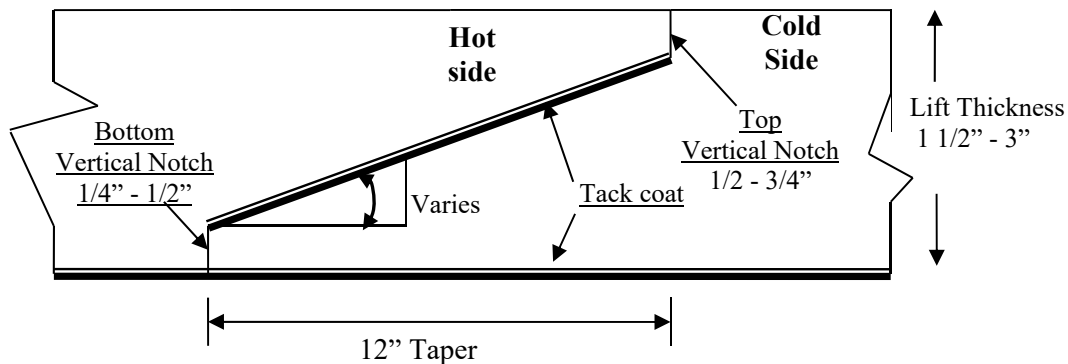
the Engineer.

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

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

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

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



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

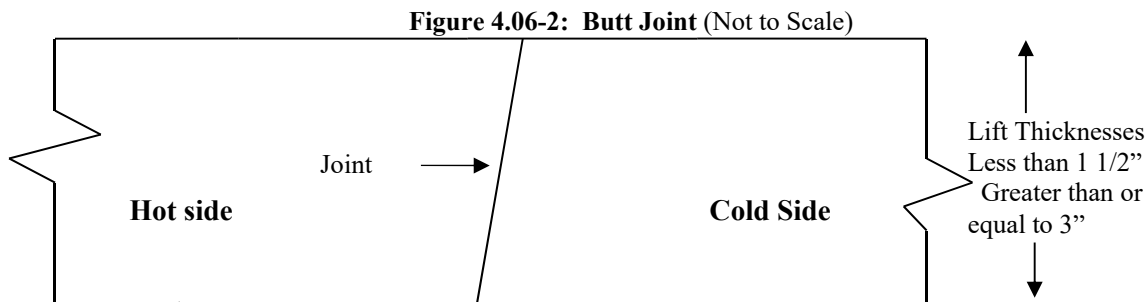
The Engineer reserves the right to define the paving limits when using a wedge joint that will be exposed to traffic.

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

Method II - Butt Joint:

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

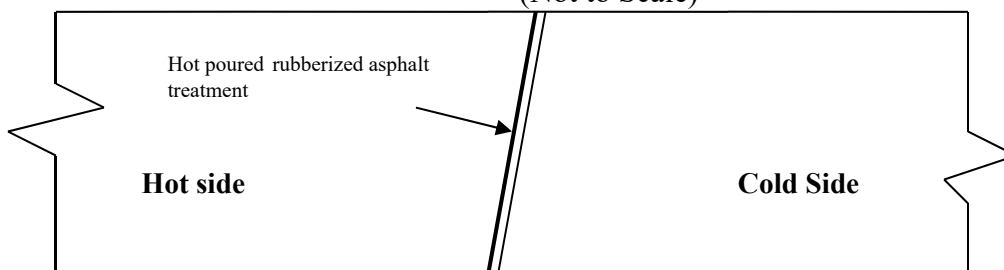
The Contractor shall not allow any butt joint to be incomplete at the end of a work shift unless otherwise allowed by the Engineer. When using this method, the Contractor is not allowed to leave a vertical edge exposed at the end of a work shift and must complete paving of the roadway full width “curb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



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

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

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



All of the requirements of Method II must be met with Method III. In addition, the longitudinal vertical edge must be treated with a rubberized joint seal material meeting the requirements of ASTM D6690, Type 2. The joint sealant shall be placed on the face of the “cold side” of the butt joint as shown above prior to placing the “hot side” of the butt joint. The joint seal material shall be applied in accordance with the manufacturer’s recommendation so as to provide a uniform coverage and avoid excess bleeding onto the newly placed pavement.

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

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

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

There are 3 components to the QCP for placement: a Standard QCP, a Project Summary Sheet

that details Project-specific information, and, if applicable, a separate Extended Season Paving Plan as required in 4.06.03-9 “Temperature and Seasonal Requirements.”

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

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

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

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

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

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

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

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

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

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

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

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

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

operations. Paving during Extended Season shall not commence until the Engineer has approved the plan.

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

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

Each lift will be separated into lots as follows:

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

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

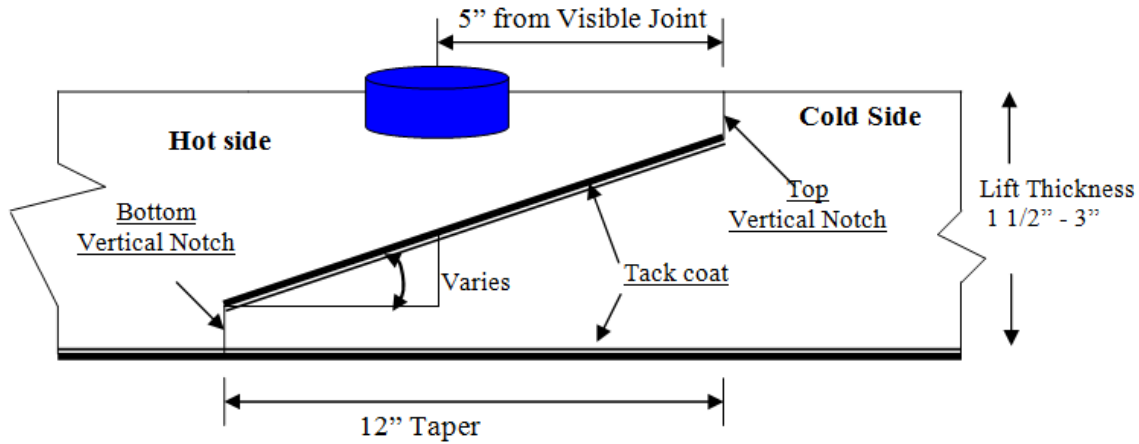
Noncontiguous areas such as highway ramps may be combined to create one lot.

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

A mat core shall not be located any closer than 1 foot from the edge of a paver pass. If a random number locates a core less than 1 foot from any edge, the location will be adjusted by the Engineer so that the outer edge of the core is 1 foot from the edge of the paver pass.

Method I, Notched Wedge Joint cores shall be taken so that the center of the core is 5 inches from the visible joint on the hot mat side (Figure 4.06-4).

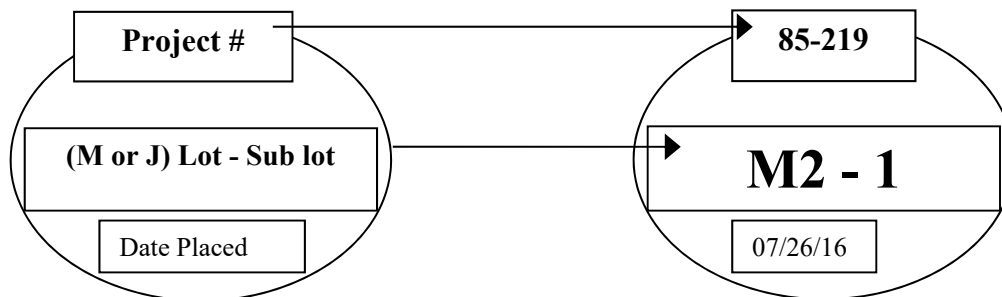
Figure 4.06-4: Notched Wedge Joint Cores (Not to Scale)



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

The cores shall be labeled by the Contractor with the Project number, date placed, lot number, and sub-lot number. The core's label shall include "M" for a mat core and "J" for a joint core. For example, a mat core from the first lot and the first sub-lot shall be labeled with "M1 - 1." A mat core from the second lot and first sub-lot shall be labeled "M2-1" (see Figure 4.06-5). The Engineer shall fill out a MAT-109 to accompany the cores. The Contractor shall deliver the cores and MAT-109 to the Department's Central Lab. The Contractor shall use a container approved by the Engineer. The container shall have a lid capable of being locked shut and tamper proof. The Contractor shall use foam, bubble wrap, or another suitable material to prevent the cores from being damaged during handling and transportation. Once the cores and MAT-109 are in the container the Engineer will secure the lid using security seals at the removable hinges(s) and at the lid opening(s). The security seals' identification number must be documented on the MAT-109. All sealed containers shall be delivered to the Department's Central Lab within two working days from time of extraction. Central Lab personnel will break the security seal and take possession of the cores.

Figure 4.06-5: Labeling of Cores



Each core hole shall be filled within 4 hours upon core extraction. Prior to being filled, the hole shall be prepared by removing any free water and applying tack coat using a brush or other

means to uniformly cover the cut surface. The core hole shall be filled using a bituminous concrete mixture at a minimum temperature of 240°F containing the same or smaller nominal maximum aggregate size and compacted with a hand compactor or other mechanical means to the maximum compaction possible. The bituminous concrete shall be compacted to 1/8 inch above the finished pavement.

Simple Average Density Lots:

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

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

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

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

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

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

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

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

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

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

PWL Density Lots:

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

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

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

11. Acceptance Sampling and Testing: Sampling shall be performed in accordance with ASTM D3665 or a statistically-based procedure of stratified random sampling approved by the Engineer.

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

Density Acceptance: The Engineer will perform all acceptance testing in accordance with AASHTO T 331. The density of each core will be determined using the daily production's average maximum theoretical specific gravity (Gmm) established during the testing of the parent material at the Plant. When there was no testing of the parent material or any Gmm exceeds the specified tolerances in the Department's current QA Program for Materials, the Engineer will determine the maximum theoretical density value to be used for density calculations.

12. Density Dispute Resolution Process: The Contractor and Engineer will work in partnership to avoid potential conflicts and to resolve any differences that may arise during quality control or acceptance testing for density. Both parties will review their sampling and testing procedures and results and share their findings. If the Contractor disputes the Engineer's test results, the Contractor must submit in writing a request to initiate the Dispute Resolution Process within five calendar days of the notification of the test results. No request for dispute resolution will be allowed unless the Contractor provides quality control results from samples taken prior to and after finish rolling, and within the timeframe described in 4.06.03-8 supporting its position. No request for dispute resolution will be allowed for a density lot in which any core was not taken within the required 5 calendar days of placement. Should the dispute not be resolved through evaluation of existing testing data or procedures, the Engineer may authorize the Contractor to obtain a new core or set of core samples per disputed lot. The core samples must be extracted no later than seven calendar days from the date of the Engineer's authorization. All such core samples shall be extracted and the core hole filled using the procedure outlined in 4.06.03-10.

a) **Simple Average Lots:** The Contractor may only dispute any simple average lot that is adjusted at or below 95 percent payment. The number and location (mat, joint, or structure) of the cores taken for dispute resolution must reflect the number and location of the original cores. The location of each core shall be randomly located within the respective original sub lot. The dispute resolution results shall be combined with the original results and averaged for determining the final in-place density value.

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

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

13. Corrective Work Procedure:

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

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

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

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

4.06.04—Method of Measurement:

1. HMA S* or PMA S*: Bituminous concrete will be measured for payment as the amount of material in tons placed as determined by the net weight on the delivered tickets and adjusted by area, thickness and weight as follows:

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

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

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

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

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

Quantity Adjusted for Area (T_A) = [(L x W_{adj})/9] x (t) x 0.0575 Tons/SY/inch = (-) tons

Where: L = Length (ft)

(t) = Actual thickness (inches)

W_{adj} = (Designed width (ft) + tolerance /12) - Measured Width)

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

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

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

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

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

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

2. Bituminous Concrete Adjustment Cost:

- a) Production Lot Adjustment: An adjustment may be applied to each production lot as follows:
- i. Non-PWL Production Lot (less than 3,500 tons):
 The adjustment values in Tables 4.06-6 and 4.06-7 will be calculated for each sub lot based on the Air Void (AV) and Asphalt Binder Content (PB) test results for that sub lot. The total adjustment for each day's production (lot) will be computed as follows:

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

Where: AdjAV_t: Percent adjustment for air voids
 AdjPB_t: Percent adjustment for asphalt binder
 Tons: Weight of material (tons) in the lot adjusted by 4.06.4-1

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

Where: AdjAV_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 = [(AdjPB₁ + AdjPB₂ + AdjPB_i + ... + 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) (%)	<u>S0.25, S0.375, S0.5, S1</u> Pb
0.0	JMF Pb ± 0.3
- 10.0	≤ JMF Pb - 0.4 or ≥ JMF Pb + 0.4

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

For each lot, the adjustment values will be calculated using PWL methodology based on AV, VMA, and PB test results. The results will be considered as being normally distributed and all applicable equations in AASHTO R 9 and AASHTO R 42 Appendix X4 will apply.

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

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

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

For PWL at and above 90%: Adj(AV_t or PB_t 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 50% in any of the 3 individual material quality characteristics will be evaluated under 1.06.04.

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

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

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

iii. Partial Lots:

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

Lots with 4 or more sub lots will be calculated as indicated in 4.06.04-2.a)ii.

Production Lot Adjustment: $T_{SD} \times \text{Unit Price} = \text{Est. (Pi)}$

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

Est. (Pi)= Pay Unit in dollars representing incentive or disincentive per lot

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

i. Simple Average Density Lot (less than 3500 tons) and Bridge Lots:

The final lot quantity shall be the difference between the total payable tons for the Project and the sum of the previous lots. If either the Mat or Joint adjustment value is “remove and replace,” the density lot shall be removed and replaced (curb to curb).

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

Tons Adjusted for Density (T_D) = $[\{(P_{AM} \times 0.50) + (P_{AJ} \times 0.50)\} / 100] \times \text{Tons}$

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

P_{AM} = Mat density percent adjustment from Table 4.06-8

P_{AJ} = Joint density percent adjustment from Table 4.06-9

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

TABLE 4.06-8: Adjustment Values for Pavement Mat density

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

Notes:

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

Notes:

⁽¹⁾ ACRPD = Average Core Result Percent Density

⁽²⁾ All Percent Adjustments to be rounded to the second decimal place; for example round 1.667 to 1.67

Additionally, any subplot with a density result below 87% will be evaluated under 1.06.04.

ii. PWL Density Lot (3,500 tons or more):

For each lot, the adjustment values will be calculated using PWL methodology based on mat and joint density test results. Only one result will be included for each subplot. The results will be considered as being normally distributed and all applicable equations in AASHTO R 9 and AASHTO R 42 Appendix X4 will apply.

The specification limits for the PWL determination are as follows:

Mat Density: 91.5-98%

Joint Density: 90-98%

For mat and joint density, the individual percent adjustment (PA) will be calculated as follows:

For PWL between 50 and 90%: $PA_{(M \text{ or } J)} = 0.25 * PWL - 22.50$

For PWL at and above 90%: $PA_{(M \text{ or } J)} = 0.125 * PWL - 11.25$

Where: PA_M = Total percent mat density adjustment value for the PWL mat density lot

PA_J = Total percent joint density adjustment value for the PWL joint density lot

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

A lot with PWL less than 50% will be evaluated under 1.06.04.

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

Tons Adjusted for Mat Density (T_{MD}) = $(PA_M / 100) \times \text{Tons}$

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

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

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

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

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

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

Additionally, any subplot with a density result below 87% will be evaluated under 1.06.04.

iii. Partial Lots:

Lots with less than 4 sub lots will be combined with the prior lot. If there is no prior lot with equivalent material and placement conditions or if the last test result of the prior lot is over 30 calendar days old, the mat and joint individual adjustments will be calculated in accordance to Tables 4.06-8 and 4.06-9. T_{MD} and T_{JD} will be calculated as indicated in 4.06.04-2.b)i.

Lots with 4 or more sub lots will be calculated as indicated in 4.06.04-2.b)ii.

Density Lot Adjustment (Simple Average Lots): T_D x Unit Price = Est. (Di)

Density Lot Adjustment (PWL Lots): (T_{MD} or T_{JD}) x 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 subplot with a density result below 87% will be evaluated under 1.06.04.

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

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

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

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

- a. Container Method – Material furnished in a container will be measured to the nearest 1/2 gallon. The volume will be determined by either measuring the volume in the original container by a method approved by the Engineer or using a separate graduated container

capable of measuring the volume to the nearest 1/2 gallon. The container in which the material is furnished must include the description of material, including lot number or batch number and manufacturer or product source.

b. Vehicle Method

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

Tack Coat (gallons at 60°F) = Measured Weight (pounds) / Weight per gallon at 60°F

Tack Coat (gallons at 60°F) = 0.996 x Measured Weight (pounds) / Weight per gallon at 77°F

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

Tack Coat (gallons at 60°F) = 0.976 x Measured Volume (gallons).

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

4.06.05—Basis of Payment:

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

All costs associated with providing illumination of the work area are included in the general cost of the work.

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

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

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

Production Lot: $\Sigma \text{ Est (Pi)} = \text{Est. (P)}$

Density Lot (Simple Average Lots): $\Sigma \text{ Est (Di)} = \text{Est. (D)}$

Density Lot (PWL): $\Sigma \text{ Est (DMi)} + \Sigma \text{ (DJi)} = \text{Est. (D)}$

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

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

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

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

pavement is included in the general cost of the work.

4. The cutting of bituminous concrete pavement will be paid in accordance with 2.02.05.
5. Material for tack coat will be paid for at the Contract unit price per gallon at 60°F for "Material for Tack Coat."
6. The Material Transfer Vehicle (MTV) will be paid at the Contract unit price per ton for "Material Transfer Vehicle."

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

SECTION 5.86 - CATCH BASINS, MANHOLES AND DROP INLETS

5.86.01—Description

5.86.02—Materials

5.86.03—Construction Methods

5.86.04—Method of Measurement

5.86.05—Basis of Payment

5.86.01—Description: The work under this Section shall consist of furnishing, preparing, and installing catch basins, manholes and drop inlets (and also the removal, abandonment, alteration, reconstruction, or conversion of such existing structures) in conformity with the lines, grades, dimensions and details shown on the plans.

This Section shall also include resetting or replacing catch basin tops as well as manhole frames and covers.

5.86.02—Materials: The materials for this work shall meet the following requirements:
 Drainage structures shall meet the requirements of M.08.02 and shall utilize concrete with a 28-day minimum compressive strength of 4000 psi.
 Galvanizing shall meet the requirements of M.06.03.
 Mortar shall meet the requirements of M.11.04.
 Butyl rubber joint seal shall meet the requirements of ASTM C990.

Where backfill occurs within an existing wetland, no reclaimed material shall be utilized.

Granular fill, if necessary, shall meet the requirements of M.02.01.
 Protective compound material shall be a type appearing on the Department's Qualified Products List and be acceptable to the Engineer, as specified in M.03.09.

5.86.03—Construction Methods: Drainage trench excavation, including rock in drainage trench excavation and backfilling, shall be performed in accordance with 2.86.03 and the requirements of the plans.

Where a drainage structure is to be installed below the surface, a drainage trench shall be excavated to the required depth, the bottom of which shall be graded to the elevation of the bottom of the proposed drainage structure or to ensure a uniform foundation for the structure.

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

When rock, as defined in 2.86.01-2, is encountered, work shall be performed in accordance with 2.86.03 and the requirements of the plans.

When a drainage structure outside of proposed drainage trench limits is to be removed, it shall be completely removed and all pipes shall be removed or plugged with cement masonry.

When a drainage structure is to be abandoned, the structure shall be removed to a depth 2 feet below the subgrade or as directed by the Engineer. The floor of the structure shall be broken and all pipes shall be plugged with cement masonry.

Drainage structures shall be constructed in accordance with the plans and the requirements contained herein for the character of the work involved. The provisions of 6.02.03 pertaining to bar reinforcement shall apply except that shop drawings need not be submitted for approval unless called for in the plans, Contract or directed by the Engineer. Welding shall be performed in accordance with the applicable sections of the AWS Structural Welding Code, D1.1.

When it becomes necessary to increase the horizontal dimensions of manholes, catch basins and drop inlets to sizes greater than those shown on the plans in order to provide for multiple pipe installations, large pipes or for other reasons, the Contractor shall construct such manholes, catch basins and drop inlets to modified dimensions as directed by the Engineer.

The surfaces of the tops of all catch basins, and drop inlets shall be given a coat of protective compound material, at the manufacturer's recommended application rate, immediately upon completion of the concrete curing period.

All masonry units shall be laid in full mortar beds.

Metal fittings for catch basins, manholes or drop inlets shall be set in full mortar beds or otherwise secured as shown on the plans.

All inlet and outlet pipes shall be set flush with the inside face of the wall of the drainage structure as shown on the plans. The pipes shall extend through the walls for a sufficient distance beyond the outside surface to allow for satisfactory connections, and the concrete or masonry shall be constructed around them neatly to prevent leakage along their outer surfaces.

When constructing a new drainage structure within a run of existing pipe, the section of existing pipe disturbed by the construction shall be replaced with new pipe of identical type and size extending from the drainage structure to the nearest joint of the existing pipe in accordance with 6.86.03 or as directed by the Engineer.

Backfilling shall be performed in accordance with 2.86.03.

Frames, covers and tops which are to be reset shall be removed from their present beds, the walls or sides shall be rebuilt to conform to the requirements of the new construction and the frames, covers and tops shall be reset as shown on the plans or as directed by the Engineer.

5.86.04—Method of Measurement:

Drainage Trench Excavation: In accordance with 2.86.04, excavation for drainage trench will not be measured for payment but shall be included in the Contract unit price for the type of structure being installed.

Rock in Drainage Trench Excavation: Rock in Drainage Trench Excavation will be measured in accordance with the drainage trench excavation limits described in 2.86.03.

Manholes, Catch Basins and Drop Inlets will be measured as separate units.

Resetting of Manholes, Catch Basins and Drop Inlets will be measured as separate units.

Replacement of frames, covers, and tops will be measured as a unit for catch basin top or manhole frame and cover.

Conversion of drainage structures as specified on the plans, or as directed by the Engineer, including structure reconstruction will be measured for payment as a unit.

Removal or abandonment of drainage structures outside of drainage trench excavation limits, as defined in 2.86.03, will be measured as separate units.

There will be no measurement or direct payment for the application of the protective compound material, the cost of this work shall be considered as included in the general cost of the work.

Measurement for payment for work and materials involved with installing pipes to connect new drainage structures into a run of existing pipe will be as provided for under the applicable Contract items in accordance with 6.86.04.

There will be no measurement or direct payment for plugging existing pipes with cement masonry, the cost of this work will be considered as included in the general cost of the work.

5.86.05—Basis of Payment:

Drainage Trench Excavation for the installation of proposed structures described herein will be paid for under the respective drainage Contract item(s) for which the excavation is being performed, in accordance with the provisions of 2.86.05.

Rock in Drainage Trench Excavation will be paid for in accordance with the provisions of 2.86.05.

Manholes and Catch Basins will be paid for at the Contract unit price for each "Manhole," or "Catch Basin," of the type specified, at "0' to 10' Deep" or "0' to 20' Deep," complete in place, which price shall include all excavation, backfill, materials, equipment, tools and labor incidental thereto.

Drop Inlets will be paid for at the Contract unit price for each "Drop Inlet," of the type specified, complete in place, which price shall include all excavation, backfill, materials, equipment, tools and labor incidental thereto.

Manholes, Catch Basins and Drop Inlets constructed to modified dimensions as directed by the Engineer, will be paid for as follows:

Where the interior floor area has to be increased to accommodate existing field conditions, as measured horizontally at the top of the base of the completed structure, and does not exceed 125% of the interior floor area as shown on the plans for that structure, then the structure shall be paid for at the Contract unit price for each "Manhole," "Catch Basin," or "Drop Inlet" of the type specified. Where the floor area is greater than 125%, the increase in the unit price for the individual structure shall be in direct proportion to the increase of the completed structure interior floor area as compared to the interior floor area as shown on the plans for that structure. Such increased unit price shall include all excavation, materials, equipment, tools, and labor incidental to the completion of the structure.

Reset Units will be paid for at the Contract unit price each for "Reset Manhole," "Reset Catch Basin," or "Reset Drop Inlet," of the type specified, respectively, complete in place, which price shall include excavation, cutting of pavement, removal and replacement of pavement structure, and all materials, equipment, tools and labor incidental thereto, except when the work requires reconstruction greater than 3 feet, measured vertically, then the entire cost of resetting the unit will be paid for as Extra Work in accordance with the provisions of 1.04.05.

Frames, Covers, and Tops when required in connection with reset units, will be paid for at the Contract unit price each for such "Manhole Frame and Cover" or "(Type) Catch Basin Top," complete in place, including all incidental expense; or when no price exists, the furnishing and placing of such material will be paid for as Extra Work in accordance with the provisions of 1.04.05.

When the catch basin top has a stone or granite curb in its design, the curb or inlet shall be included in the cost of the "(Type) Catch Basin Top."

Conversion of drainage structures will be paid for at the Contract unit price each for "Convert Catch Basin to (Type) Catch Basin," "Convert Catch Basin to (Type) Manhole," or "Convert Manhole to (Type) Catch Basin," complete in place, which price shall include excavation, cutting of pavement, removal and replacement of pavement, backfill, all alterations to existing structure, all materials including catch basin frame and grate of the type specified, or manhole frame and cover, all equipment, tools and labor incidental thereto.

The maximum change in elevation of frame under these items shall not exceed 3 feet. Greater depth changes, if required, shall be paid for as Extra Work, in accordance with 1.04.05.

Removal or abandonment of drainage structures outside of drainage trench excavation limits as defined in 2.86.03 will be paid for at the Contract unit price each for "Remove Drainage Structure – 0' to 10' Deep," "Remove Drainage Structure – 0' to 20' Deep," or "Abandon Drainage Structure," which price shall include excavation, cutting of pavement, removal and replacement of pavement, backfill, and all equipment, tools and labor incidental thereto.

Pay Item	Pay Unit
(Type) Catch Basin – 0' to 10' Deep	ea.
(Type) Catch Basin – 0' to 20' Deep	ea.
Manhole (Size) – 0' to 10' Deep	ea.
Manhole (Size) – 0' to 20' Deep	ea.
(Type) Drop Inlet	ea.
Reset Catch Basin	ea.
Reset Manhole	ea.
Reset Drop Inlet	ea.
Convert Catch Basin to (Type) Catch Basin	ea.
Convert Catch Basin to (Type) Manhole	ea.
Convert Manhole to (Type) Catch Basin	ea.
Manhole Frame and Cover	ea.
(Type) Catch Basin Top	ea.
Remove Drainage Structure – 0' to 10' Deep	ea.
Remove Drainage Structure – 0' to 20' Deep	ea.
Abandon Drainage Structure	ea.

SECTION 6.01 - CONCRETE FOR STRUCTURES

Replace Section 6.01 in its entirety with the following:

6.01.01—Description

6.01.02—Materials

6.01.03—Construction Methods

6.01.04—Method of Measurement

6.01.05—Basis of Payment

6.01.01—Description: This item shall include concrete for use in new construction, surface repair or structural repair of bridges and culverts, walls, catch basins, drop inlets and other incidental construction. The concrete shall be composed of Portland cement, pozzolans, fine and coarse aggregate, admixtures and water, prepared and constructed in accordance with these specifications, at the locations and of the form dimensions and class shown on the plans, or as directed by the Engineer.

The use of concrete from dry batch or central mixed plants is permitted for all concrete mixtures.

6.01.02—Materials: The materials for this work shall meet the requirements of M.03. Surface or structural repair concrete shall be documented on the delivery ticket, as required in 6.01.03-II-3(a), as having the plastic properties necessary for confined placement to ensure appropriate workability for consolidation within the forms.

6.01.03—Construction Methods:

I. Concrete Quality Control (QC) Requirements: For all bridge deck and bridge parapet construction, the Contractor must demonstrate to the Engineer that the materials and work that will be provided by their field staff, subcontractors, and suppliers meets Contract specification requirements.

This effort shall be documented with a **Concrete Quality Control Plan (CQCP)** and shall address the communication with all parties, on-site inspection, sampling and testing frequency necessary to keep the production, placement and finishing operations in control, to determine when an operation has gone out of control and anticipated procedure to correct the situation in a timely manner.

1. General – provide an overview of the means and methods anticipated to perform the work including any anticipated conditions that may need additional attention (such as seasonal conditions requiring heating or cooling of concrete)
2. Contractor Organization – address authority levels/duties by position and name of persons holding those positions; include those who have decision making authority with regard to quality control, materials, sampling and testing who can be contacted by the Engineer
3. Concrete Mix Design – identify concrete supplier(s); provide copies of all applicable mix designs to field staff; and address submittal timeframe
4. Transportation and Delivery of Concrete – identify the supplier’s plant capacity and ability to ensure continuous delivery to the Project to meet the requirements of the mix design and a corrective procedure if it does not meet Project requirements; include a provision for the addition of admixtures and follow up testing
5. Placement and Finishing of Concrete – identify and describe:

- (a) placement equipment
 - (b) placement method(s) to be used (chute, pump, hopper or other)
 - (c) starting point and direction of placement (logistical sequencing)
 - (d) slip forming, formwork, stay-in-place forms or other forming method(s)
 - (e) joint construction method(s)
 - (f) process and documentation that the elevations, base, forms, reinforcement (including support chairs and ties), utility inserts or any other appurtenance installations have been inspected by the Contractor prior to concrete placement
 - (g) equipment and method(s) to be used for vibrating and consolidating concrete
 - (h) procedure for verifying adequate consolidation and how segregation will be addressed
 - (i) schedule and method(s) to be used for finishing all exposed surfaces
6. Curing of Concrete – describe schedule and method(s) for curing of concrete and how the method(s) will be monitored and maintained
7. Contractor QC testing – identify person(s) or firms responsible for Contractor QC testing and provide copies of their certification(s) (see 6.01.03-5), and testing facility location(s). In addition, describe the process used for communication between the QC testing personnel and the Contractor project staff; describe what measures will be taken when test results are out of compliance; this shall include what increased frequency of testing is to be performed to verify that concrete properties are in compliance; the threshold at which time placement ceases; describe what protective measures will be used in case of unforeseen weather
8. The CQCP shall include the name and qualifications of a Quality Control Manager (QCM) provided by the Contractor. The QCM shall be responsible for the administration of the CQCP, and any modifications that may become necessary. The QCM shall have the ability to direct all Contractor personnel on the Project during concreting operations and must communicate directly with the concrete supplier. At a minimum the QCM shall be certified as a **Concrete Transportation Construction Inspector by the American Concrete Institute (ACI)**.
9. The CQCP must include a provision for pre-placement meeting(s) to be held with representatives of the Engineer, the concrete supplier, the QCM and the Contractor’s field staff supervising the work.
- (a) Timing and number of the meeting(s) will be determined by the complexity of the mix design or placement.
 - (b) Non-Standard mix designs that require trial placements will be discussed at the Preconstruction Meeting to remind the Contractor of the time needed for testing. Additional meeting(s) should be scheduled at least 90 days prior to first use of non-standard mix designs, to allow suppliers to perform trial batches and testing.
 - (c) Discussions shall include the configuration and specific application that the concrete will be used for, plastic properties and workability, any mix design challenges, trial placement procedures and subsequent trial results, timing and quantities. Refer to 6.01.03-II-6(e) for additional requirements.
10. The CQCP shall be submitted to the Engineer and concrete supplier for review and comment a minimum of 30 days prior to production or placement. Production and placement shall not occur until all comments of the Engineer and supplier have been addressed by the Contractor. Changes to the CQCP based on data not available at time of submittal may be added via addendum.

11. The Contractor shall provide the Engineer QC test results within 48 hours after testing or inspection in a format acceptable to the Engineer. The Contractor shall also maintain complete records of all QC tests.

Review of the CQCP does not relieve the Contractor of its responsibility to comply with the Project specifications. The Contractor may modify the CQCP as work progresses and must document the changes in writing prior to resuming operations. These changes include but are not limited to changes in quality control procedures or personnel.

II. New Construction:

1. Falsework and Forms: Falsework is considered to be any temporary structure which supports structural elements of concrete, steel, masonry or other material during the construction or erection. Forms are to be considered to be the enclosures or panels which contain the fluid concrete and withstand the forces due to its placement and consolidation. Forms may in turn be supported on falsework.

This work shall consist of the construction and removal of falsework and forms that are designed by the Contractor in the execution of the work, and whose failure to perform properly could adversely affect the character of the Contract work or endanger the safety of adjacent facilities, property, or the public. Forms shall be mortar tight. Forms and falsework shall be of sufficient rigidity and strength to safely support all loads imposed and to produce in the finished structure the lines and grades indicated in the Contract documents. Forms shall also impart the required surface texture and rustication and shall not detract from the uniformity of color of the formed surfaces. Forms shall be made of wood, steel or other material approved by the Engineer.

(a) Design: The design of falsework and formwork shall conform to the *AASHTO Guide Design Specifications for Bridge Temporary Works*, or to other established and generally accepted design codes such as ACI Standard *ACI 347-Recommended Practice for Concrete Formwork* or specific form or falsework manufacturer specifications. When other than new or undamaged materials are used, appropriate reductions in allowable stresses, and decreases in resistance factors or imposed loads shall be used for design.

(b) Loads: The design of the falsework and forms shall be based on load factors specified in the *AASHTO LRFD Bridge Design Specifications* and all applicable load combinations shall be investigated. The design load for falsework shall consist of the sum of appropriate dead and live vertical loads and any horizontal loads.

As a minimum, dead loads shall include the weight of the falsework and all construction material to be supported. The combined unit weight of concrete, reinforcing and pre-stressing steel, and forms that is supported shall be assumed to be not less than:

1. Normal-weight concrete: 0.16 kip/ft³
2. Lightweight concrete: 0.13 kip/ft³

Live loads shall consist of the actual weight of any equipment to be supported, applied as concentrated loads at the points of contact and a uniform load of not less than 0.02 kip/ft² applied over the area supported, plus 0.075 kip/ft applied at the outside edge of deck overhangs.

The horizontal load used for the design of the falsework bracing system shall be the sum of the horizontal loads due to equipment; construction sequence including unbalanced hydrostatic forces from fluid concrete and traffic control devices; stream flow, when

applicable; and an allowance for wind. However, in no case shall the horizontal load to be resisted in any direction be less than 2% of the total dead load.

For post-tensioned structures, the falsework shall also be designed to support any increase in or redistribution of loads caused by tensioning of the structure. Loads imposed by falsework onto existing, new, or partially completed structures shall not exceed those permitted in 6.01.03-II-12, Application of Loads.

- (c) **Working Drawings:** The working drawings for falsework and formwork shall be prepared in accordance with 1.05.02 whenever the falsework or formwork exceeds 14.0 feet high or whenever vehicular, marine, or pedestrian traffic may travel under or adjacent to the falsework or formwork. Working drawings shall include the sequence, method and rate of placement of the concrete.

Manufacturer catalog cuts or written installation procedures shall be provided for any clips, braces, hangers or other manufactured parts used with the formwork or falsework.

- (d) **Construction:** Forms and falsework shall be built true to lines and grades shall be strong, stable, firm, mortar-tight and adequately braced or tied, or both. They shall be designed and constructed to withstand all loads and pressures including those imposed by plastic concrete, taking full account of the stresses due to the rate of placement, effect of vibration and conditions brought about by construction methods. Forms and falsework shall be constructed to compensate for variations in camber of supporting members and allow for deflections.

Falsework and formwork shall be chamfered at all sharp corners, unless otherwise ordered or permitted, and shall be given a slight bevel or draft in the case of projections to ensure satisfactory removal. Materials for falsework and formwork and their supports, ties and bracing, shall be of the type, quality and strength to achieve the structural requirements. Form material in contact with concrete shall provide the finished concrete surface smoothness as specified in 6.01.03-II-10, Finishing Concrete Surfaces, and shall have a uniform appearance.

Falsework and formwork shall be treated with form oil or other release agent approved by the Engineer before the reinforcing steel is placed or self-releasing forms approved by the Engineer may be used. Release agents which will adhere to or discolor the concrete shall not be used.

Falsework and formwork for concrete surfaces exposed to view shall produce a smooth surface of uniform texture, free of voids, indentations, protrusions and bulges. Panels lining falsework and formwork shall be arranged so that the joint lines form a symmetrical pattern conforming to the general lines of the structure. The same type of form-lining material shall be used throughout each element of a structure. Falsework and formwork shall be sufficiently rigid so that the undulation of the concrete surface shall not exceed 1/4 inch when checked with a 4 foot straightedge or template.

For non-exposed surfaces the falsework and formwork shall be sufficiently rigid so that the undulation of the concrete surface shall not exceed 1/2 inch when checked with a 4 foot straightedge or template.

Metal ties and anchors to hold the falsework and formwork in alignment and location shall be so constructed that the metal work can be removed to a depth of at least 2 inches from the concrete surface without damage to the concrete. All cavities resulting from the removal of metal ties shall be filled after removal of forms with cement mortar of the same

proportions used in the body of the work or other materials approved by the Engineer, and the surface finished smooth and even, and if exposed in the finished work, shall be similar in texture and color of adjacent surfaces. With permission of the Engineer, the Contractor need not remove from the underneath side of bridge decks portions of metal devices used to support reinforcing steel providing such devices are of material, or are adequately coated with material, that will not rust or corrode. When coated reinforcing steel is required, all metal ties, anchorages, or spreaders that remain in the concrete shall be of corrosion-resistant material or coated with a dielectric material.

Forms shall be clean and clear of all debris. For narrow walls and columns where the bottom of the form is inaccessible, an access opening will be allowed in the form and falsework for cleaning out extraneous material.

(e) Vacant

- (f) Bridge Decks:** After erection of beams and prior to placing falsework and forms, the Contractor shall take elevations along the top of the beam at the points shown on the plans or as directed by the Engineer. The Contractor shall calculate the haunch depths and provide them to the Engineer a minimum of 7 days prior to installing the falsework and forms. The Contractor shall also provide calculations for the setting of the overhang brackets based on the final beam deflection. These calculations shall be based on the final proposed deck grade and parapet elevations.

Falsework or formwork for deck forms on girder bridges shall be supported directly on the girders so that there will be no appreciable differential settlement during placing of the concrete. Girders shall be either braced and tied to resist any forces that would cause rotation or torsion in the girders caused by the placing of concrete for diaphragms or decks, or shown to be adequate for those effects. Unless specifically permitted, welding of falsework support brackets or braces to structural steel members or reinforcing steel shall not be allowed.

- (g) Stay-In-Place Metal Forms for Bridge Decks:** These forms may be used if shown in the Contract documents or approved by the Engineer. Prior to the use of such forms and before fabricating any material, the Contractor shall submit working drawings to the Engineer for review in accordance with 1.05.02. These drawings shall include the proposed method of form construction, erection plans including placement plans, attachment details, weld procedure(s), material lists, material designation, gage of all materials, and the details of corrugation. Also, copies of the form design computations shall be submitted with the working drawings. Any changes necessary to accommodate stay-in-place forms, if approved, shall be at no cost to the Department.

The metal forms shall be designed on the basis of the dead load of the form, reinforcement and the plastic concrete, including the additional weight of concrete [considered to be equivalent to the weight imposed by an additional concrete thickness equal to 3% of the proposed deck thickness, but not to exceed 0.3 inch] due to the deflection of the metal forms, plus 50 psf for construction loads. The allowable stress in the corrugated form and the accessories shall not be greater than 0.725 times the yield strength of the furnished material and the allowable stress shall not exceed 36,000 psi. The span for design and deflection shall be the clear distance between edges of the beams or girders less 2 inches and shall be measured parallel to the form flutes. The maximum deflection under the weight of plastic concrete, reinforcement, and forms shall not exceed 1/180 of the form

span or 0.5 inches, whichever is less. In no case shall the loading used to estimate this deflection be less than 120 psf. The permissible form camber shall be based on the actual dead load condition. Camber shall not be used to compensate for deflection in excess of the foregoing limits. The form support angles shall be designed as a cantilever and the horizontal leg of the form support angle shall not be greater than 3 inches.

No stay-in-place metal forms shall be placed over or be directly supported by the top flanges of beams or girders. The form supporting steel angles may be supported by or attached to the top flanges.

Stay-in-place metal forms shall not be used in bays where longitudinal slab construction joints are located, under cantilevered slabs such as the overhang outside of fascia members, and bridges where the clearance over a salt-laden body of water is less than 15 feet above mean high water level.

Welding to the top flanges of steel beams and girders is not permitted in the areas where the top flanges are in tension, or as indicated on the plans. Alternate installation procedures shall be submitted addressing this condition.

Drilling of holes in pre-stressed concrete beams or the use of power-actuated tools on the prestressed concrete beams for fastening of the form supports to the pre-stressed concrete beams will not be permitted. Welding of the reinforcing steel to the pre-stressed units is not permitted.

All edges of openings cut for drains, pipes, and similar appurtenances shall be independently supported around the entire periphery of the opening. All fabricated stay-in-place metal forms shall be unloaded, stored at the Project Site at least 4 inches above the ground on platforms, skids or other suitable supports and shall be protected against corrosion and damage and handled in such a manner as to preclude damage to the forms. Damaged material shall be replaced at no additional cost to the State.

Any exposed form or form support metal where the galvanized coating has been damaged, shall be thoroughly cleaned, wire brushed, then coated with 2 coats of Zinc Dust – Zinc Oxide primer, FS No. TT-P-641d, Type II or another product acceptable to the Engineer.

The forms shall be installed from the topside in accordance with the manufacturer's recommended installation procedures. The form supports shall ensure that the forms retain their correct dimensions and positions during use at all times. Form supports shall provide vertical adjustment to maintain design slab thickness at the crest of corrugation, to compensate for variations in camber of beams and girders and to allow for deflections. Stay-in-place metal forms shall have a minimum depth of the form valley equal to 2 inches. The forms shall have closed tapered ends. Lightweight filler material shall be used in the form valleys.

All field cutting shall be done with a steel cutting saw or shears including the cutting of supports, closures and cutouts. Flame cutting of forms is not permitted.

All welding shall be performed by Department-certified welders in accordance with the Welding subarticle in 6.03. Welding of forms to supports is not permitted.

The steel form supports shall be placed in direct contact with the flange of stringer or floor beam flanges and attached by bolts, clips, welding where permitted, or other approved means. Form sheets shall not be permitted to rest directly on the top of the stringer or floor beam flanges. The forms shall be securely fastened to form supports with self-drilling fasteners and shall have a minimum bearing length of 1 inch at each end. In the areas

where the form sheets lap, the form sheets shall be securely fastened to one another by fasteners at a maximum spacing of 18 inches. The ends of the form sheets shall be securely attached to the support angles with fasteners at a maximum spacing of 18 inches or 2 corrugation widths, whichever is less.

The depth of the concrete slab shall be as shown on the plans and the corrugated forms shall be placed so that the top of the corrugation will coincide with the bottom of the deck slab. No part of the forms or their supports shall protrude into the slab. All reinforcement in the bottom reinforcement mat shall have a minimum concrete cover of 1 inch unless noted otherwise on the plans.

The completed stay-in-place metal form system shall be sufficiently tight to prevent leakage of mortar. Where forms or their installation are unsatisfactory in the opinion of the Engineer, either before or during placement of the concrete, the Contractor shall correct the defects before proceeding with the work.

- (h) **Construction Joints:** Construction joints other than those shown on the plans will not be permitted without prior approval of the Engineer. In joining fresh concrete to concrete that has already set, the work already in place shall have all loose and foreign material removed, and the surface roughened and thoroughly drenched with water.

All reinforcing steel shall extend continuously through joints. Where unplanned construction joints may be needed, they shall be constructed as directed by the Engineer.

- (i) **Expansion and Contraction Joints:** Expansion and contraction joints shall be constructed at the locations and in accordance with the details specified in the Contract. The forming of joint openings shall be dimensioned in accordance with the joint manufacturer's design requirements. Joints include open joints, filled joints, joints sealed with sealants, joints reinforced with steel armor plates or shapes, paraffin coated joints, and joints with combinations of these features.

Open joints shall be placed at locations designated on the plans and shall be formed by the insertion and subsequent removal of templates of wood, metal or other suitable material. The templates shall be so constructed that their removal may be readily accomplished without damage to the work.

Filled joints shall be made with joint filler, the materials for which shall meet the requirements of the plans and of these specifications.

For mechanical joint systems, the concrete shall be placed in such a manner that does not interfere with the movement of the joint.

- (j) **Pipes, Conduits and Utility Installations:** The Contractor shall coordinate the installation of pipes, conduits and utilities as shown on the plans and in accordance with the Contract or as directed by the Engineer. The openings accommodating such pipe, conduit and utility installations shall be incorporated into the formwork by the Contractor.
- (k) **Anchorage:** Anchor bolts and systems shall be set to the requirements of the plans and Contract. Anchor bolts and systems shall be clean and free of dirt, moisture or other foreign materials at the time of installation. The anchor bolts and systems shall be installed prior to placing concrete.

With the Engineer's approval, the Contractor may install anchorages after placement and setting of the concrete or in formed holes. The anchorages shall be installed into drilled or formed holes having a diameter and a depth suitable to receive the bolts in accordance with the grout manufacturer's requirements. Such holes shall be located to avoid damage to the

existing reinforcement. All holes shall be perpendicular to the plane surface. The Contractor shall take every precaution necessary to prevent damage to the concrete due to freezing of water or grout in anchor bolt holes.

- (l) **Ornament or Reverse Moulds:** Ornamental work, when so noted on the plans, shall be formed by the use of reverse moulds. These moulds shall be produced by a qualified manufacturer approved by the Engineer. They shall be built in accordance with the general dimensions and appearance shown on the plans. The Contractor shall submit all detailed drawings, models, or carvings for review by the Engineer before the moulds are made.

The Contractor shall be responsible for their condition at all times, and shall be required to remove and replace any damaged or defective moulds at no additional cost to the State.

The surfaces of the moulds shall be given a coating of form release agent to prevent the adherence of concrete. Any material which will adhere to or discolor the concrete shall not be used.

Form Liners, if required, shall be installed as specified elsewhere.

- (m) **Removal of Falsework and Forms:** The Contractor shall consider the location and character of the structure, the weather, the materials used in the mix, and other conditions influencing the early strength of the concrete when removing forms and falsework.

Methods of removal likely to cause damage to the concrete surface shall not be used.

Supports shall be removed in such a manner as to permit the structure to uniformly and gradually take the stresses due to its own weight. For structures of 2 or more spans, the sequence of falsework release shall be as specified in the Contract or approved by the Engineer.

Removal shall be controlled by field-cured cylinder tests. The removal shall not begin until the concrete has achieved 75% of the design compressive strength. To facilitate finishing, side forms carrying no load may be removed after 24 hours with the permission of the Engineer, but the curing process must be continued for 7 days.

When the results of field-cured cylinder tests are unavailable, the time periods listed in Table 6.01.03-1, exclusive of days when the temperature drops below 40°F, may govern the removal of forms.

Table 6.01.03-1 Time Restrictions for Removal of Formwork

Structure Element	Minimum Time Period
Arch Centers, centering under beams, pier caps, and unsupported elements	14 days
Slabs on grade, Abutments and Walls	24 hours
Columns	2 days
Bridge Decks	28 days

The Contractor may submit for review and approval by the Engineer, alternate methods to determine the in-place strength of the concrete for removal of forms and falsework.

- 2. Protection from Environmental Conditions:** The concrete shall be protected from damage due to weather or other environmental conditions during placing and curing periods. In-place concrete that has been damaged by weather conditions shall be either repaired to an acceptable condition or removed and replaced as determined by the Engineer.

- (a) **Rain Protection:** The placement of concrete shall not commence or continue unless

adequate protection satisfactory to the Engineer is provided by the Contractor.

(b) Hot Weather Protection: When the ambient air temperature is above 90°F, the forms, which will come in contact with the mix shall be cooled to below 90°F for a minimum of 1 hour prior to and 1 hour after completion of the concrete placement by means of a water spray or other methods satisfactory to the Engineer.

(c) Cold Weather Protection: When there is a probability of ambient air temperature below 40°F during placement and curing, a Cold-Weather Concreting Plan shall be submitted to the Engineer for review and comment. The Plan shall detail the methods and equipment, including temperature measuring devices that will be used to ensure that the required concrete and air temperatures are maintained.

1. Placement: The forms, reinforcing steel, steel beam flanges, and other surfaces which will come in contact with the mix shall be heated to a minimum of 40°F, by methods satisfactory to the Engineer, for a minimum of 1 hour prior to, and maintained throughout, concrete placement.

2. Curing: For the first 6 days, considered the initial cure period, the concrete shall be maintained at a temperature of not less than 45°F and the air temperature surrounding the structure shall be maintained at a temperature of not less than 60°F. When the concrete mix includes pozzolans or slag, the initial cure period shall be increased to 10 days. After the initial cure period, the air surrounding the structure shall be maintained above 40°F for an additional 8 days. If external heating is employed, the heat shall be applied and withdrawn gradually and uniformly so that no part of the concrete surface is heated to more than 90°F or caused to change temperature by more than 20°F in 8 hours. The Engineer may reduce or increase the amount of time that the structure must be protected or heated based on an indication of in-place concrete strength acceptable to the Engineer.

(d) Additional Requirements for Bridge Decks: Prior to the application of curing materials, all the concrete placed on bridge decks shall be protected from damage due to rapid evaporation by methods acceptable to the Engineer. During periods of low humidity (less than 60% relative humidity), sustained winds of 25 mph or more, or ambient air temperatures greater than 80°F the Contractor shall provide written details of additional measures to be taken during placement and curing.

Protection may include increasing the humidity of the surrounding air with fog sprayers and employing wind-breaks or sun-shades. Additional actions may include reduction of the temperature of the concrete prior to placement, scheduling placement during the cooler times of days or nights, or any combination of these actions.

(e) Concrete Exposed to Salt Water: No Construction joints shall be formed between the levels of extreme low water and extreme high water or the upper limit of wave action as determined by the Engineer.

3. Transportation and Delivery of Concrete: All material delivered to the Project shall be supplied by a producer qualified in accordance with M.03. The producer shall have sufficient plant capacity and trucks to ensure continuous delivery at the rate required to prevent the formation of cold joints.

(a) Material Documentation: All vendors producing concrete must have their weigh scales and mixing plant automated to provide a detailed ticket. Delivery tickets must include the following information:

1. State of Connecticut printed on ticket
2. Name of producer, identification of plant
3. Date and time of day
4. Type of material
5. Cubic yards of material loaded into truck
6. Project number, purchase order number, name of Contractor (if Contractor other than producer)
7. Truck number for specific identification of truck
8. Individual aggregate, cement, water weights and any admixtures shall be printed on plant tickets
9. Water/cement ratio, and
10. Additional water allowance in gallons based on water/cement ratio for mix

A State inspector may be present to monitor batching or weighing operations.

The Contractor shall notify the Engineer immediately if, during the production day, there is a malfunction of the recording system in the automated plant or weigh scales.

Manually written tickets containing all required information may be allowed for up to 1 hour after malfunction provided they are signed by an authorized representative of the producer.

- (b) Transportation of Mixture:** Trucks delivering concrete shall be qualified in accordance with M.03.

If the concrete mix arrives at the Project with a slump lower than allowed by specification, water may be considered as a means to temper concrete to bring the slump back to within specification. This tempering may only be done prior to discharge with the permission of the Engineer. The quantity of water in gallons added to the concrete cannot exceed the allowance shown on the delivery ticket.

The concrete shall be completely discharged into the forms within 1-1/2 hours from the batch time stamped on the delivery ticket. This time may be extended if the measured temperature of the concrete is below 90°F. This time may also be reduced if the temperature of the concrete is over 90° F. Rejected concrete shall be disposed of by the Contractor at no cost to the State.

The addition of chemical admixtures or air entrainment admixtures at the Project Site, to increase the workability or to alter the time of set, will only be permitted if prior approval has been granted by the Engineer. The addition of air entrainment admixtures at the Project Site will only be permitted by the producer's quality control staff. The Contractor is responsible for follow-up quality control testing to verify compliance with the Specifications.

4. Acceptance Testing and Test Specimens: The Contractor shall furnish the facilities and concrete required for sampling, transport to the testing location in the field, performing field testing and for casting sample cylinders for compressive-strength determinations. The Department will furnish personnel for sampling and casting Acceptance specimens and the number of specimens required will be determined by the Engineer. The equipment for the Department's testing is provided for elsewhere in the Contract.

- (a) Temperature, Air Content and Slump:** Field testing in accordance with AASHTO T-23, "Making and Curing Concrete Test Specimens in the Field" will be performed at the point of placement and at a frequency determined by the Engineer.

- (b) Acceptance Testing and Compressive Strength Specimens:** Concrete samples are to be taken at the point of placement into the forms or molds. Representatives of the Engineer will sample the mix.

Table 6.01.03-2 Plastic Properties of Portland Cement Concrete

Standard Mix Class	Air Content	Slump ³	Concrete Temperature
PCC0334Z ¹ (3300 psi)	6.0 +/- 1.5%	As submitted	60°-90° F
PCC0336Z ¹ (3300 psi)			
PCC0446Z ¹ (4400 psi)			
PCCXXX8Z ¹	7.5 +/- 1.5%	As submitted	
Modified Standards ²	6.0 +/- 1.5% ²	As submitted	
Special Provision Mix ⁴	As specified	As submitted	
¹ "Z" denotes the Exposure Factor 0, 1 or 2 as described in Table M.03.02-1a			
² Modifications to Standard Mixes, including mixes placed by pumping, shall be reviewed by the Engineer prior to use. These include but are not limited to the use of chemical admixtures such as high range water reducing (HRWR) admixtures and the use of coarse aggregate sizes for that class not specified in M.03.			
³ If the <u>only</u> modification is the addition of HRWR, the maximum allowable slump shall be 7 inches.			
⁴ All concrete mixes with a mix design strength not shown in the table must be approved by the Engineer on a case-by-case basis. Limits on the plastic properties and strength requirements of these mixes are listed in the Specifications.			

The Contractor shall provide and maintain facilities on the Project Site, acceptable to the Engineer, for sampling, transporting the initial sample, casting, safe storage and initial curing of the concrete test specimens as required by AASHTO T-23. This shall include but not be limited to a sampling receptacle, a means of transport of the initial concrete sample from the location of the concrete placement to the testing location, a level and protected area of adequate size to perform testing, and a specimen storage container capable of maintaining the temperature and moisture requirements for initial curing of Acceptance specimens. The distance from the location of concrete placement to the location of testing and initial curing shall be 100 feet or less, unless otherwise approved by the Engineer.

The specimen storage container described in this section is in addition to the concrete cylinder curing box provided for elsewhere in the Contract.

After initial curing, the test specimens will be transported by Department personnel and stored in the concrete cylinder curing box until they can be transported to the Division of Materials Testing for strength evaluation.

- (c) Sampling Procedure for Pumping:** It is the responsibility of the Contractor to provide concrete that meets specification at the point of placement.

Samples of concrete shall be taken at the discharge end of the pump at the point of placement with the exception of underwater concrete. The Contractor may submit an alternate location to provide a sample from the discharge end of the pump with verification showing that the characteristics of the mix will not be altered from that of which would have been attained at the point of placement. The Engineer will review the documentation and other extenuating circumstances when evaluating the request.

In the case of underwater concrete the Contractor shall submit the proposed sampling location with the submittals required in 6.01.03-II-6(f).

(d) Additional field testing: Additional field testing such as density and yield measurements may be required at the time of placement as determined by the Engineer.

5. Progression Cylinders and Compressive Strength Specimens: Progression Cylinders outlined in this section are field cured compressive strength specimens taken for information related to when a structure or segment of a structure can be loaded or put into service, adequacy of curing and protection of concrete in the structure, or when formwork or shoring may be removed from the structure. The information produced from strength results of Progression Cylinders will not be considered for acceptance of the concrete.

The personnel, equipment, and molds for sampling, casting, curing and testing of Progression Cylinders shall be furnished by the Contractor at no expense to the Department.

Sampling, casting, and field curing of the specimens shall be performed in accordance with AASHTO T23 by an ACI Concrete Field Testing Technician Grade 1 or higher and will be witnessed by a representative of the Department.

The sample shall be taken at the point of placement into the forms or molds from 1 or more of the same truck loads that an Acceptance sample is taken from.

A minimum of 2 of cylinder results will be used to determine in-place strength.

Compression testing shall be performed in accordance with AASHTO T 22 by personnel approved by the Engineer.

A Certified Test Report in accordance with 1.06.07 shall be provided to the Engineer reporting the Progression Cylinder test results. A copy of the results of the compressive strength testing shall be provided to the Engineer at least 24 hours prior to any Project activity that the results may control.

6. Handling and Placing Concrete: Concrete shall be handled, placed, and consolidated by methods acceptable to the Engineer that will not segregate the mix and shall result in a dense homogeneous concrete. The methods used shall not cause displacement of reinforcing steel or other materials to be embedded in the concrete. Concrete shall not be placed until the forms and all materials have been inspected by the Engineer. All mortar from previous placements, debris, and foreign material shall be removed from the forms and steel prior to commencing placement. The forms and subgrade shall be thoroughly moistened with water immediately before concrete is placed. All water that has ponded within the forms shall also be removed. Temporary form spreader devices shall not be left in place.

All laitance or unsound material shall be removed before placing substructure concrete onto the surface of any concrete placed underwater.

Placement of concrete for each section of the structure shall be performed continuously between construction or expansion joints as shown on the plans. The delivery rate, placing sequence and methods shall be such that fresh concrete is always placed and consolidated against previously placed concrete before initial set has occurred. The temperature of the concrete mixture during placement shall be maintained between 60°F and 90°F. During and after placement of concrete, care shall be taken not to damage the concrete or break the bond with reinforcing steel. Platforms for workers and equipment shall not be supported directly on any reinforcing steel. Forces that may damage the concrete shall not be applied to the forms or reinforcing steel.

- (a) Sequence of Placement:** The sequence of placement shall be in accordance with the Contract or as permitted by the Engineer.

Concrete for integral horizontal members, such as caps, slabs, or footings shall not be placed until the concrete for the columns, substructure, culvert walls and similar vertical members has achieved sufficient strength as stated in 6.01.03-II-1(m).

The concrete in arches shall be placed in such a manner as to load the formwork uniformly and symmetrically.

The base slab or footings of cast-in-place box culverts shall reach sufficient strength before the remainder of the culvert is constructed.

- (b) Placement Methods:** The Contractor shall notify the Engineer at least 24 hours in advance of intention to place concrete.

Vibrators shall not be used to shift the fresh concrete horizontally. Vibrators shall be adequate to consolidate the concrete and integrate it with the previous lift.

The rate of concrete placement must not produce loadings that exceed those considered in the design of the forms.

The use of chutes and pipes for conveying concrete into the forms must be reviewed by the Engineer. Chutes shall be clean, lined with smooth watertight material and, when steep slopes are involved, shall be equipped with baffles or reverses. When the discharge must be intermittent, a hopper or other device for regulating the discharge shall be provided.

Aluminum shall not be permanently incorporated into the concrete unless otherwise specified.

When placing operations involve dropping the concrete more than 5 feet, the Contractor shall take action to prevent segregation of the mix and spattering of mortar on steel and forms above the elevation of the lift being placed. This restriction shall not apply to cast-in-place pilings.

When using stay-in-place forms, concrete shall not be dropped more than 3 feet above the top of the forms, and the concrete shall be discharged directly over the beams or girders.

- (c) Pumping:** The Contractor shall use equipment specifically manufactured to pump concrete mixes and that meets the needs of the specific concrete placement.

- (d) Consolidation:** Unless otherwise specified, all concrete, except concrete placed under water, shall be sufficiently consolidated by mechanical vibration immediately after placement.

The Contractor shall provide a sufficient number of commercially available mechanical immersion type vibrators to properly consolidate the concrete immediately after it is placed in the forms unless external form vibrators are used. The Contractor shall have an adequate number of operable vibrators available in case of breakdown.

External form vibrators may be used if submitted prior to concrete placement and reviewed by the Engineer.

Vibration shall not be applied directly to the reinforcement or hardened concrete. Special care shall be taken in placing and consolidating concrete around ornamental moulds, form liners and other embedded items. The vibrator shall not touch these items at any time.

- (e) Additional Requirements for Bridge Decks:** At least 15 days before the erection of the screed rails, the Contractor shall submit screed erection plans, grades and sequence of concrete placement and proposed rate of placing concrete for review by the Engineer.

These plans shall include details of equipment to be used in the placement and finishing of the concrete, including the number and type of personnel who will be engaged in placing the concrete. The screed equipment shall be a commercially available vibratory system. The use of wooden screeds is prohibited.

When setting screed rails for mechanical finishing, the Contractor shall take into consideration and make proper allowances for the deflection of the bridge superstructure due to all operations.

Screed and runway supports shall not be located on any stay-in-place metal form sheets, form supports or reinforcing steel. The Contractor shall operate the mechanical screed at least 24 hours prior to actual placement of the concrete to verify deck survey and equipment operations to the satisfaction of the Engineer.

A Pre-Placement Meeting shall be held on the project site with Contractor, Engineer and concrete supplier 48 hours before the concrete deck pour. The Pre-Placement Meeting will document and include discussion on the following topics:

1. Schedule:

- (a) Deck pour sequence
- (b) Daily start and finish times for concrete delivery
- (c) Anticipated completion time

2. Key Personnel:

- (a) Concrete placement foreman
- (b) Total number of personnel involved in deck pour and their roles during the pour
- (c) Concrete supplier
- (d) Concrete pump truck operator/service
- (e) Discuss QC/QA

3. Placement:

- (a) List of approved delivery trucks per pour
- (b) Pre-wetting forms prior to placement
- (c) Placement sequence
- (d) Rate of concrete placement and vibrator process
- (e) Monitor concrete temperature during placement
- (f) Transverse joint bulkheads
- (g) Approved concrete low-permeability mix design

4. Curing:

- (a) Curing materials (burlap, quilted blankets, etc.)
- (b) Means for pre-soaking curing materials.
- (c) Foggers
- (d) Soaker hoses
- (e) White Plastic Sheeting
- (f) Water source and supply tanks

Concrete shall be deposited in a uniform manner across the entire width being placed, and only 2 passes of the transverse screed will be permitted over a given deck area, unless otherwise allowed by the Engineer.

If the Contractor proposes to place concrete outside of daylight hours, an adequate lighting system must be provided.

Concrete shall be deposited in accordance with the placement sequence as noted on the plans. If no sequence is indicated, the Contractor shall provide a placement sequence to the Engineer for review. The placement sequence shall proceed in such a manner that the total deflection or settlement of supporting members, and the final finishing of the surface will occur before the initial set of the concrete takes place.

At construction joints, concrete shall not be placed against the previously placed concrete for at least 12 hours unless otherwise allowed by the Engineer.

- (f) Underwater Placement:** Concrete may only be placed under water within a cofferdam unless otherwise specified in the Contract or allowed by the Engineer. Placement shall begin following inspection and acceptance of the depth and character of the foundation material by the Engineer.

Underwater concrete mixes are considered non-standard designs and shall be submitted to the Engineer for approval. Typically a minimum of 10% additional cement than comparable non-underwater mixes will be required.

Underwater concrete shall be placed continuously with the surface of the concrete kept as horizontal as practical. To ensure thorough bonding, each succeeding layer shall be placed before the preceding layer has taken initial set. For large concrete placements, more than 1 tremie or pump shall be used to ensure compliance with this requirement.

Mass concrete placement requirements, outlined in 6.01.03-II-6(g), do not apply to underwater concrete.

To prevent segregation, underwater concrete shall be placed in a compact mass, in its final position, by means of a tremie, concrete pump, or other approved method and shall not be disturbed. Still water shall be maintained at the point of deposit. Cofferdams shall be vented during the placement and curing of the concrete to equalize the hydrostatic pressure and thus prevent flow of water through the concrete.

If a tremie is used, the method of depositing the concrete shall be detailed in a submission to the Engineer as a working drawing for review. The tube shall have watertight couplings and shall permit the free movement of the discharge end over the area of the work.

- (g) Mass concrete placement:** Mass concrete placement shall be defined as any placement, excluding underwater concrete placement, in which the concrete being cast has dimensions of 5 feet or greater in each of 3 different directions. For placements with a circular cross-section, a mass concrete placement shall be defined as any placement that has a diameter of 6 feet or greater and a height of 5 feet or greater. For all mass concrete placements, the mix temperature shall not exceed 85°F as measured at point of discharge into the forms.

Any special concrete mix design proposed by the Contractor to meet the above temperature requirements shall be submitted to the Engineer for review.

7. Finishing Plastic Concrete: Unless otherwise specified in the Contract, after concrete has been consolidated and prior to final curing, all surfaces of concrete that are not placed against forms shall be struck-off to the planned elevation or slope. The surface shall be finished by floating with an acceptable tool. While the concrete is still in a workable state, all construction and expansion joints shall be tooled with an edger. Joint filler shall be left exposed. For requirements on float finish, refer to 6.01.03-II-10, Finishing Concrete Surfaces.

After completion of the placing and finishing operation and for at least 12 hours after the concrete has set, the Contractor shall not operate any equipment in the immediate vicinity of the

freshly placed concrete if, in the opinion of the Engineer, it could cause excessive vibration, movement or deflection of the forms.

The addition of water to the surface of the concrete to assist in finishing operations will not be permitted.

(a) Bridge Decks: After the concrete has been consolidated and brought to the proper elevation by the screed machine, it shall be finished by use of a suitable float. The Contractor shall not disturb the fresh concrete after it has been finished. All finishing work, including the application of the fog spray and placement of the curing mats, shall be performed from work bridges supported above the deck surface. A work bridge shall be made available to the Engineer for inspection of the concrete work.

Surfaces that are to be covered with a waterproofing membrane shall be finished to a smooth surface, free of mortar ridges and other projections and in accordance with the membrane manufacturer's recommendations.

Unless otherwise noted in the Contract, the concrete wearing surfaces shall be given a skid-resistant texture by dragging, brooming, tining, or by a combination of these methods. These methods shall be done after floating and at such time and in such manner that the desired texture will be achieved while minimizing displacement of the larger aggregate particles.

1. Dragging: The surface shall be finished by dragging a seamless strip of damp burlap over the surface. The burlap to be dragged shall consist of sufficient layers and have sufficient length in contact with the concrete to slightly groove the surface. The burlap shall be drawn longitudinally along the surface in a slow manner so as to leave an even texture. The burlap shall be kept damp, clean, and free of particles of hardened concrete. The Contractor may propose an alternate material for the Engineer's consideration.
2. Tining: Tining shall be in a transverse direction using a wire broom, comb, or float having a single row of tines or fins. The tining grooves shall be between 1/16 inch and 3/16 inch wide and between 1/8 inch and 3/16 inch deep, spaced 1/2 inch to 3/4 inch on centers. Tining shall be discontinued 12 inches from the curb line on bridge decks. The area adjacent to the curbs shall be given a light broom finish longitudinally. As an alternative, tining may be achieved using a machine designed specifically for tining or grooving concrete pavements.

The transverse grooving shall be performed when the grooves can be formed to a maximum depth of 3/16 inch with relative ease and without the walls of the grooves closing in on each other. The tining shall be aligned so as to prevent overlapping of grooves in any 2 successive transverse passes. The Contractor shall measure the depth of the grooves in the presence of the Engineer with an appropriate device to ensure compliance.

(b) Surface Testing and Correction: The completed surface shall be constructed in accordance with grades and cross slopes shown on the plans. The entire surface shall be checked by the Contractor in the presence of the Engineer, with an acceptable 10 foot straightedge.

1. The surface shall not vary more than +/- 1/8 inch over 10 feet for decks which will not be covered with an overlay.
2. The surface shall not vary more than +/- 1/4 inch over 10 feet for decks which will be

covered with an overlay.

Variations greater than these, which, in the opinion of the Engineer, may adversely affect the riding qualities of the surface shall be corrected, and this shall be done at the expense of the Contractor. The Contractor shall submit a corrective procedure to the Engineer for review and approval. The procedure shall correct such irregularities by methods such as, but not limited to, concrete planing or grooving.

8. Bearing Surfaces: Concrete surfaces under metallic masonry plates and elastomeric bearings shall have a float finish. After the concrete has set, the area which will be in contact with the masonry plate shall be ground as necessary to provide full and even bearing. The finished surface shall not vary from a straightedge laid on the surface in any direction within the limits of the masonry plate by more than 0.0625 inch. Surfaces which fail to conform shall be ground or filled until acceptable to the Engineer.

9. Curing Concrete: All newly placed concrete shall be cured so as to prevent loss of water by use of the methods specified. The Engineer may request that the Contractor furnish a curing plan.

The duration of the initial and final curing period in total shall continue uninterrupted for a minimum of 7 days.

(a) Curing Methods:

1. Forms-In-Place Method: Formed surfaces of concrete may be cured by retaining the forms in place without loosening. During periods of hot weather, water shall be applied to the forms until the Engineer determines that it is no longer required.
2. Water Method: Exposed concrete surfaces shall be kept continuously wet by ponding, spraying, or covering with materials that are kept continuously and thoroughly wet. Such materials may consist of cotton mats, multiple layers of burlap, or other approved materials that do not discolor or otherwise damage the concrete.
3. Waterproof Cover Method: This method shall consist of covering exposed surfaces with a waterproof sheet material to prevent moisture loss from the concrete. The concrete shall be wet at the time the cover is installed. The sheets shall be of the widest practicable width and adjacent sheets shall overlap a minimum of 6.0 inches to form a waterproof cover of the entire concrete surface and shall be adequately secured. Broken or damaged sheets shall be immediately repaired and the concrete shall be remoistened.

(b) Additional Requirements for Bridge Decks:

Curing Plan: The Contractor shall submit to the Engineer, at least 14 days prior to the placement of concrete for the bridge deck, a detailed curing plan that describes the following:

- A. the initial and final curing durations,
- B. equipment and materials to be used for curing concrete and monitoring concrete temperature,
- C. and proposed primary and secondary water and heat sources
 1. Initial Curing Period: A water fog spray shall be used by the Contractor from the time of initial placement until the final curing period begins. The amount of fog spray shall be strictly controlled so that accumulations of standing or flowing water on the surface of the concrete shall not occur.

Should atmospheric conditions render the use of fog spray impractical, the Contractor shall request approval from the Engineer to use a curing compound that meets the requirements of M.03 in lieu of a fog spray. The application shall be in accordance with the manufacturer's recommendation and be compatible with the membrane waterproofing.

2. Final Curing: After completion of finishing and as soon as any bleed water has dissipated and the concrete reaches sufficient strength to avoid marring, the Final curing period shall begin and the entire concrete surface shall be covered with water-retaining materials such as cotton mats, multiple layers of burlap, or other materials approved by the Engineer. Materials used shall be kept saturated by means of an acceptable sprinkler or wetting system.

The Contractor may cover the wet water-retaining material with a suitable polyethylene film to minimize evaporation during the curing period. The use of the polyethylene film does not relieve the Contractor from maintaining saturation of the curing materials.

3. Temperature Monitoring: The internal temperature of the concrete shall be monitored with a calibrated continuous recording thermometer for a minimum of 7 days. The air temperature at the concrete surface or the air temperature between the concrete surface and its protective covering shall be monitored with a minimum of 1 recording thermometer.

The number and placement of the thermometers will be determined by the Engineer. A minimum of 2 thermometers per concrete placement shall be provided by the Contractor.

The following types of thermometers shall be used to monitor curing temperatures:

- i) Continuously Recording Thermometer: The thermometer shall be capable of continuously recording temperatures within a range of -4°F to 122°F for a minimum of 24 hours.
- ii) Maximum–Minimum Recording Thermometer: For all placements, the thermometer shall be capable of recording maximum and minimum temperatures in a range of -4°F to 122°F.

10. Finishing Concrete Surfaces: Any minor repairs due to fins, bulges, offsets and irregular projections shall be performed immediately following the removal of forms. For areas of newly placed concrete that are honeycombed or segregated the Contractor shall provide a written corrective procedure for review by the Engineer prior to the work being performed. Construction and expansion joints in the completed work shall be left carefully tooled and free of mortar and concrete. The joint filler shall be left exposed for its full length with clean and true edges.

The cavities produced by form ties and all other holes, broken corners or edges, and other defects shall be cleaned, saturated with water, pointed and trued with a mortar conforming to M.11.04. Cement similar in color to the exposed surface being repaired shall be added to the mortar. Mortar used in pointing shall be used within 1 hour of mixing. The concrete shall be finished as defined below if required and the cure continued as previously specified in 6.01.03-II-9, Curing Concrete.

Finishing work shall not interrupt the curing period unless permitted by the Engineer. The curing period may be extended to provide the minimum total number of days required.

Concrete surface finishes shall be classified as follows:

- (a) **Float Finish:** This finish shall be achieved by placing an excess of material in the form and removing or striking off of such excess forcing the coarse aggregate below the mortar surface. Concave surfaces in which water will be retained will not be allowed. After the concrete has been struck off, the surface shall be thoroughly worked and floated. Before this last finish has set, the surface shall be lightly stripped with a fine brush to remove the surface cement film, leaving a fine-grained, smooth, but sanded texture. Curing, as specified elsewhere, shall follow. Any surfaces that will support appurtenances such as light standards, railing, or fences shall be finished in accordance with 6.01.03-II-8, Bearing Surfaces.
- (b) **Rubbed Finish:** The initial rubbing shall only be allowed within 3 days after placement. The entire surface shall be thoroughly wet with a brush and rubbed with a No. 16 Carborundum Stone or an abrasive of equal quality, bringing the surface to a paste. The rubbing shall be continued sufficiently to remove all form marks and projections, producing a smooth, dense surface without pits or irregularities. The paste formed by the rubbing may be finished by stripping with a clean brush, or it may be spread uniformly over the surface and allowed to re-set. If all or portions of the rubbed surface are unacceptable to the Engineer or a rubbed finish is not provided within 3 days after removal of forms, the Contractor will be directed to provide a grout clean down finish.
- (c) **Grout Clean-Down Finish:** As soon as all cavities have been filled as required elsewhere and the cement mortar has set sufficiently, grout clean-down shall be performed. All burrs, unevenness, laitance, including that in air holes, and any other material which will adversely affect the bond of the grout to the concrete, shall be removed by acceptable methods. This cleaning shall be done from the top or uppermost part of the surface to be finished to the bottom.

A mixture of a fine aggregate and Portland cement shall be thoroughly blended while dry. The proportions shall be such that when mixed with the proper amount of water, the color will match that of the concrete to be finished. Water shall be added to this mixture in an amount which will bring the grout to a workable thick paint-like consistency.

The surface to be treated shall be thoroughly wetted with a sufficient amount of water to prevent the absorption of water from the grout. Grout shall then be applied to the wetted surface before setting of the grout occurs. Grout which has set shall not be re-tempered and shall be disposed of by the Contractor at no cost to the State.

The grout shall be uniformly applied over the entire surface, completely filling all air bubbles and holes. Immediately after applying the grout, the surface shall be floated with a suitable float, scouring the surface vigorously. While the grout is still plastic, all excess grout shall be removed.

After the final rubbing is completed and the surface has dried, it shall be rubbed to remove loose powder and shall be left free from all unsound patches, paste, powder, and objectionable marks. Wetting, application and removal of excess grout shall be completed in 1 work shift.

All finished surfaces shall be cured for a minimum of 24 hours. Horizontal surfaces shall have a float finish and vertical exposed surfaces shall have a rubbed finish. A grout clean down finish may be substituted for a rubbed finish as noted in this section or as directed by the Engineer.

11. Mortar, Grout, Epoxy and Joint Seal:

- (a) **Mortar and Grout:** This work consists of the making and placing of mortar and grout. At least 48 hours prior to the planned use, a copy of the installation instructions and MSDS sheets shall be provided to the Engineer for review and concurrence of their applicability and for verification of proper hole sizes in concrete structures. Such uses include mortar for filling under masonry plates, mortar used to fill voids and repair surface defects, grout used to fill sleeves for anchor bolts, and mortar and grout for other such uses where required or approved.

Concrete areas to be in contact with the mortar or grout shall be cleaned of all loose or foreign material that would in any way prevent bond, and the concrete surfaces shall be flushed with water and allowed to dry until no free-standing water is present.

The mortar or grout shall completely fill and shall be tightly packed into recesses and holes, on surfaces, under structural members, and at other locations specified. After placing, all surfaces of mortar or grout shall be cured as previously specified in 6.01.03-II-9(a)-2, for a period of not less than 3 days.

- (b) **Epoxy:** The epoxy shall be prepared and placed in accordance with the manufacturer's directions and with the equipment prescribed by the manufacturer. Instructions furnished by the supplier for the safe storage, mixing, handling and application of the epoxy shall be followed. Contents of damaged or previously opened containers shall not be used.

- (c) **Joint Seal:** This work consists of sealing joints where shown on the plans or as otherwise directed by the Engineer.

Before placement of the sealing material, the joints shall be thoroughly cleaned of all scale, loose concrete, dirt, dust or other foreign matter. Projections of concrete into the joint space shall be removed. The joint shall be clean and dry before the sealing compound is applied.

The joint sealant shall be prepared and placed in accordance with the manufacturer's directions and with the equipment prescribed by the manufacturer. The sealing compound shall be flush with, or not more than 1/8 inch above the adjacent surface of concrete, cutting off all excess compounds after the application. The joints shall be sealed in a neat and workmanlike manner and when the work is completed, the joints shall effectively seal against infiltration of moisture and water.

The Contractor shall arrange for, and have present at the commencement of the joint-sealing operation, a technically competent manufacturer's representative knowledgeable in the methods of installation of the sealant. The Contractor shall also arrange to have the representative present at such other times as the Engineer may request.

- (d) **Closed Cell Elastomer:** The closed cell elastomer shall be of the thickness specified and installed as shown on the plans and shall be in accordance with M.03.08-6.

12. Application of Loads: Loads shall not be applied to concrete structures until the concrete has attained sufficient strength and, when applicable, sufficient pre-stressing and post tensioning has been completed, so that damage will not occur. The means to determine when the concrete has attained sufficient strength shall be the use of Progression cylinders as defined elsewhere in this specification, or other means approved in advance by the Engineer.

- (a) **Earth Loads:** The placement of backfill shall not begin until the concrete is cured and has reached at least 80% of its specified strength unless otherwise permitted by the Engineer.

The sequence of placing backfill around structures shall minimize overturning or sliding forces and flexural stresses in the concrete.

- (b) Construction Loads:** Light materials and equipment may be hand carried onto bridge decks only after the concrete has been in place at least 24 hours providing curing is not interfered with and the surface texture is not damaged.

Prior to the concrete achieving its specified compressive strength, any other live or dead loads imposed on existing, new, or partially completed portions of structures, shall not exceed the reduced load carrying capacity of the structure, or portion of structure. The Contractor may be required to submit calculations to the Engineer that verify these requirements are being met. The compressive strength of concrete ($f'c$) to be used in computing the load-carrying capacity shall be the smaller of the actual field compressive strength at the time of loading or the specified design strength of the concrete. The means to determine the actual field compressive strength shall be approved by the Engineer.

For post-tensioned structures, no live or dead loads shall be allowed on any span until the steel for that span has been tensioned.

- (c)** Precast concrete or steel girders shall not be placed on substructure elements until the substructure concrete has attained 85% of its specified strength.

No load shall be allowed on mortar or grout that has been in place less than 72 hours.

- (d) Traffic Loads:** The concrete deck will not be opened to traffic until at least 14 days after the last placement of deck concrete and until such concrete has attained its specified strength.

13. Dispute Resolution: The basis of any dispute resolution is side-by-side and quality control testing by the Contractor or the Contractor's representative. The Contractor and Engineer should perform independent testing on the material to reasonably establish the true characteristics of the material at the time of delivery. Absent of Contractor QC testing, the Engineer's test results will apply to the quantity of concrete represented by the sample, not to exceed 75 c.y.

Air Content: Contractor QC Testing must be performed by personnel qualified by The American Concrete Institute as an ACI Concrete Field Testing Technician Grade 1 or higher and performed in accordance with AASHTO T-23. If the Contractor's test results vary from those of the Engineer, the Contractor shall immediately notify the Engineer of the difference and work cooperatively to determine the reasonable cause and recognize the valid test. Should there be agreement, the result of the valid test will be used for acceptance and adjustment purposes for that lot of material. Should there not be an agreement as to the valid test, an additional set of tests should be performed. Results of all valid tests on the same lot may be averaged and used for acceptance and adjustment purposes. Should the Contractor wish to perform additional QC testing on subsequent material, the lot sizes may be adjusted to the amount of material included in that specific delivery. Any such QC testing must be witnessed and agreed to by the Engineer.

Compressive Strength: Contractor QC testing for compressive strength must be performed in accordance with AASHTO T-22 by personnel approved by the Engineer. Samples used to dispute the Engineer's test results must be made simultaneously and from the same batch of concrete. Should the Contractor wish to pursue a dispute resolution with regard to compressive strength, the Contractor shall submit in writing to the Engineer all test results, control charts, or other documentation that may be useful in determining if the specific lot(s) of material met the Contract specifications. The Engineer will consider the submittal and may average specific test results on the disputed lot(s) for acceptance and adjustment purposes. Destructive testing of any

kind on the placed concrete structure will not be allowed.

III. Additional Requirements for Surface Repairs and Structural Repairs

1. Work Area Access and Shielding: Prior to removal of existing concrete, the Contractor shall provide access to the anticipated work areas so that the inspector and the Contractor may together determine and delineate the exact limits and locations of the work.

The Contractor shall design, furnish, install and remove a shield(s) to prevent debris from entering areas adjacent or beneath the work. The Contractor shall submit working drawings to the Engineer in accordance with 1.05.02. The shield(s) shall be maintained by the Contractor and remain in place during all phases of the repair work.

2. Concrete Removal: The perimeter of each area to be repaired shall be saw cut as shown on the plans. All concrete within that area shall be removed to at least 1 inch beneath any visible reinforcing steel and to sound concrete. The reinforcing steel shall not be damaged or its bond in the surrounding concrete. The Contractor must use fifteen (15) pound hammers or other methods accepted by the Engineer.

In addition to removal of concrete to a depth of 1 inch below reinforcing steel, localized areas of removal may be required if embedded galvanic anodes are specified in the Contract, to allow a minimum of 2 inches of concrete cover over the anodes.

Any steel reinforcing scheduled to be left in place that is damaged during the concrete removal process shall be replaced in accordance with 6.02 to the satisfaction of the Engineer and at the expense of the Contractor.

Corroded, missing, or broken reinforcing steel shall be replaced in accordance with 6.02 and as shown on the plans or as directed by the Engineer.

The Contractor shall perform the work in a manner that prevents debris from entering roadway lanes or areas below the structure. All debris shall be removed from the Site and disposed of by the Contractor.

3. Surface Preparation: All newly exposed surfaces of concrete shall be sandblasted and be visibly free from oil, solvent, grease, loose particles, or any other foreign matter. Exposed reinforcing steel shall be sandblasted in accordance with SSPC-SP-6, Commercial Blast Cleaning, to remove all contaminants, rust and rust scale.

4. Installation of Embedded Galvanic Anodes: After sandblasting reinforcing steel, galvanic anodes shall be embedded where shown on the plans and in accordance with the Contract.

5. Welded Wire Fabric in Vertical and Overhead Surface Repairs: Prior to installing formwork, steel welded wire fabric meeting the requirements of M.06.01-3 shall be installed at the proper depth in those areas as shown on the plans or directed by the Engineer. The fabric shall be tied to exposed reinforcing steel or anchored to sound concrete using means approved by the Engineer.

6. Formwork: Forms and support systems shall be designed in accordance with 6.01.03-II-1. Forms shall be so designed so that access is from the top of the formwork. If access is not possible from the top of the formwork, the Contractor shall submit a method of concrete placement for review by the Engineer.

7. Concrete Placement and Curing: Bonding compounds shall not be used before or during the placement of the concrete. Exposed surfaces shall be wetted with water immediately prior to placement. There shall be no excessive water on the surface or in the formwork. Light rust on sandblasted reinforcing steel can be anticipated and is acceptable.

The temperature of the air and surface to be repaired at the time of placement and curing shall be a minimum of 45°F. Concrete shall be placed and consolidated immediately with appropriate vibratory equipment.

Forms shall be kept moist and shall be left in place for a minimum of 7 days or as shown on the plans.

8. Form Removal and Sequence of Repair: Form removal shall be in accordance with 6.01.03-II-1(m) unless otherwise noted on the plans. The Contractor shall follow the sequence of repairs shown on the plans.

9. Finishing: Immediately following curing and form stripping, the exposed faces shall be finished in accordance with Subarticle 6.01.03-II-10(c) Grout Clean-Down Finish.

10. Sounding of Completed Repairs: Cured and finished areas may be sounded by the Engineer to detect the presence of subsurface voids or delamination. Such areas shall be removed and replaced by the Contractor at its expense until an acceptable repair is in place as determined by the Engineer.

11. Sealing Concrete Surfaces: After all repairs have been accepted, penetrating sealer shall be applied in accordance with the Contract to the repaired areas as well as all contiguous areas to the repair or as directed by the Engineer.

6.01.04—Method of Measurement: This work will be measured for payment as follows:

1. Concrete used for new construction: The quantity of concrete used for new construction will be the actual volume in cubic yards of the specified class, with the exception of underwater concrete, completed and accepted within the neat lines as shown on the plans or as ordered by the Engineer. Parapets will be measured for payment by the number of linear feet of parapet, completed and accepted. The length of parapet will be measured along the centerline of the top of the parapet.

When concrete is placed against bedrock, a maximum of 6 additional inches beyond the neat lines can be measured for payment.

No deduction will be made for panels, form liners, reinforcing bars, structural steel shapes or for pile heads. There will be no deduction made for the volume occupied by culvert and drainage pipes, scuppers, weep holes, public utility structures or any other opening, unless the surface area of any such single opening is 9 s.f. or more.

In the case of culverts or drainage pipes, the computation of the surface area will be based on the nominal diameter of the pipe, disregarding the thickness of the shell.

Miscellaneous materials necessary for completion of the work such as felt, mortar, grout, epoxy and joint seal will not be measured for payment.

Incidental work such as forming for anchor bolts, utilities, keyways, and sampling and testing will not be measured for payment.

The work to produce and administer the Concrete Quality Control Plan (CQCP) will not be measured for payment.

2. Underwater Concrete: When underwater concrete is used, it will be measured by the volume in cubic yards within the actual horizontal limits of the cofferdam and between the elevations established by the Engineer.

3. Concrete used for Surface or Structural Repairs: The quantity of concrete used for surface repairs or structural repairs will be the actual volume completed and accepted. Welded wire fabric used in repair areas will not be measured for payment.

4. Joint Filler: This material will be measured by the area in square feet of the joint filler, of the type and thickness specified, installed and accepted.

5. Closed Cell Elastomer: This material will be measured by the volume in cubic inches of elastomer, of the thickness specified, installed and accepted.

6.01.05—Basis of Payment: Payment for this work will be made as follows:

1. Concrete: Progress payments may be allowed for completed major labor elements of work such as forming, placing and curing. Prior to placement, the Contractor shall submit a proposed schedule of values for review and approval by the Engineer.

Payment for any lot of concrete allowed to remain in place will be adjusted when the field and laboratory testing of the material is completed. The quantity of concrete in each lot for new construction will be a maximum of 75 c.y. Payment for each lot of concrete will be adjusted based on the results of the acceptance testing performed by the Engineer.

The pay factors listed in Table 6.01.05-1 apply for Standard and Modified Standard Mix classes with regard to entrained air content.

Table 6.01.05-1 Entrained Air Content Pay Factors

Specified Entrained air (%)*				Pay factor (%)
6.0 +/- 1.5%		7.5 +/- 1.5%		1.00 (100)
4.3 and 4.4	7.6 and 7.7	5.8 and 5.9	9.1 and 9.2	0.98 (98)
4.1 and 4.2	7.8 and 7.9	5.6 and 5.7	9.3 and 9.4	0.96 (96)
3.9 and 4.0	8.0 and 8.1	5.4 and 5.5	9.5 and 9.6	0.94 (94)
3.7 and 3.8	8.2 and 8.3	5.2 and 5.3	9.7 and 9.8	0.92 (92)
3.5 and 3.6	8.4 and 8.5	5.0 and 5.1	9.9 and 10.0	0.90 (90)
Concrete lots with less than 3.5% or greater than 8.5% entrained air will be rejected.		Concrete lots with less than 5.0% or greater than 10% entrained air will be rejected.		
*Air content measured at time and point of placement				

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

Table 6.01.05-2a Compressive Strength Pay Factors

Compressive Strength (%)	Pay factor (%)
95 or greater	1.00 (100)
90 to 94.9	0.95 (95)
85 to 89.9	0.90 (90)
*Measured at 28 days	
Concrete lots with less than 85% specified strength will be rejected.	

The pay factors listed in Table 6.01.05-2b apply for Standard and Modified Standard Mix classes with regard to surface resistivity when specified in accordance with AASHTO T 358 using 4 inch × 8-inch cylinders.

Table 6.01.05-2b Permeability Pay Factors

Surface Resistivity (kΩ-cm)*	Pay factor (%)
29 or greater	1 (100)
25 to 28.9	0.85 (85)
21 to 24.9	0.75 (75)
*Measured at 56 days	
Concrete lots with resistivity values less than 21 will be rejected.	

The payment adjustment value for entrained air, 28-day strength, and permeability if applicable, for any lot of concrete for new construction that is allowed to remain in-place is determined using the formulas listed in Table 6.01.05-3a. An Index Price of \$400.00 per c.y. will be used to calculate each adjustment, except for Parapet Concrete, for which an Index Price of \$100 per l.f. will be used. The sum of the individual adjustment values will be deducted from the cubic yard or linear foot payment for the appropriate item.

Table 6.01.05-3a Payment Adjustment Formulas for New Construction

Adj (air) = (1 - air pay factor) × Index Price × lot size (c.y. or l.f.)
Adj (strength) = (1 - strength pay factor) × Index Price × lot size (c.y. or l.f.)
Adj (permeability) = (1 - permeability pay factor) × Index Price × lot size (c.y. or l.f.)
Total Adjustment = Adj (air) + Adj (strength) + Adj (permeability)

The payment adjustment value for entrained air and 28-day strength for any lot of repair concrete that is allowed to remain in-place is determined using the formulas listed in Table 6.01.05-3b. An index price of \$200.00 per c.f. shall be used to calculate each adjustment. The total adjustment value will be the sum of each individual adjustment value and will be deducted from the cubic foot payment for the appropriate item.

Table 6.01.05-3b Payment Adjustment Formulas for Repair Concrete

Adj (air) = (1 - air pay factor) × \$200/c.f. × lot size (c.f.)
Adj (strength) = (1 - strength pay factor) × \$200/c.f. × lot size (c.f.)
Total Adj = Adj (air) + Adj (strength)

The Contractor shall request permission from the Engineer to remove and replace a lot(s) of concrete to avoid a negative payment adjustment. Any replacement material will be sampled, tested and evaluated in accordance with this specification.

No direct payment will be made for any labor, equipment or materials used during the sampling and testing of the concrete for Progression or Acceptance. The cost shall be considered as included in the general cost of the work or as stated elsewhere in the Contract. The work of transporting the concrete test specimens, after initial curing, for Acceptance testing will be performed by the Department without expense to the Contractor.

This material used for new construction will be paid for at the Contract unit price per cubic yard or linear foot less any adjustments, for the specified class, complete in place, which price shall include all materials, equipment, tools, labor and work incidental thereto, including Concrete Quality Control Plan, heating, all admixtures, joint sealer, roofing felt, and any miscellaneous materials such as metal flashing and metal used in expansion joints and bearings.

2. Underwater Concrete: When this class of concrete is used, it will be paid for at the Contract unit price per cubic yard for "Underwater Concrete," complete in place, which price shall include all materials, equipment, tools, labor and work incidental thereto.

3. Concrete Used For Structural Repairs or Surface Repairs: The material used for structural repairs or surface repairs will be paid for at the Contract unit price per cubic foot less any adjustments, complete in place, which price shall include saw cutting, removing concrete, sandblasting, cleaning, forming, placing, curing, stripping, and finishing new surfaces, and all materials, equipment, tools, labor and clean-up incidental thereto.

4. Joint Filler: Expansion joint filler will be paid for at the Contract unit price per square foot for "Joint Filler for Bridges" of the type and thickness specified, complete in place, which price shall include all materials, equipment, tools, labor and work incidental thereto.

5. Closed Cell Elastomer: Closed cell elastomer will be paid for at the Contract unit price per cubic inch for "Closed Cell Elastomer" of the thickness specified, complete in place, which price shall include all materials, equipment, tools, labor and work incidental thereto.

Embedded galvanic anodes, deformed steel bars, and penetrating sealer, will be paid for separately.

Pay Item	Pay Unit
Footing Concrete	c.y.
Footing Concrete (Mass)	c.y.
Abutment and Wall Concrete	c.y.
Abutment and Wall Concrete (Mass)	c.y.
Column and Cap Concrete	c.y.
Column and Cap Concrete (Mass)	c.y.
Bridge Deck Concrete	c.y.
Bridge Deck Concrete (SIP Forms)	c.y.
Parapet Concrete	l.f.
Bridge Sidewalk Concrete	c.y.
Approach Slab Concrete	c.y.
Barrier Wall Concrete	c.y.
Underwater Concrete	c.y.
Surface Repair Concrete	c.f.
Structural Repair Concrete	c.f.
Class PCCXXYZ Concrete	c.y.
(Thickness and Type) Joint Filler for Bridges	s.f.
(Thickness) Closed Cell Elastomer	c.i.

SECTION 6.03 - STRUCTURAL STEEL

Section 6.03 is amended as follows:

6.03.03—Construction Methods: Revise Subarticle 4(f) “High Strength Bolted Connections” as follows:

Replace the first paragraph and Table A: "Minimum Bolt Tension in kips" with the following:

" The assembly of structural connections using high-strength bolts shall be installed so as to develop the minimum required bolt tension specified in Table A. The Manufacturer’s certified test report; including the rotational capacity test results must accompany the fastener assemblies. Fastener Assemblies delivered without the certified reports will be rejected.

Table A: Minimum Bolt Tension in kips*

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

*Equal to 70% of specified minimum tensile strength of bolts (as specified in ASTM Specifications for tests of full-size F3125 Grade A 325 and F3125 Grade A 490 bolts with UNC threads, loaded in axial tension) rounded to the nearest kip.

Revise the last sentence of the sixteenth paragraph, "Rotational-Capacity Tests" as follows:

" When performed in the field, the procedure shall meet the requirements of ASTM F3125 Annex A2."

In Table C, insert the word "Grade" in the third row before every occurrence of "A325" and "A490."

SECTION 6.86 - DRAINAGE PIPES, DRAINAGE PIPE ENDS

6.86.01—Description

6.86.02—Materials

6.86.03—Construction Methods

6.86.04—Method of Measurement

6.86.05—Basis of Payment

6.86.01—Description: This work shall consist of furnishing, preparing and installing drainage pipes of the size and type specified, bedding material, joint sealant, rubber gaskets, clamps, collars, grout, grout collars, drainage trench excavation, backfilling or satisfactory disposal of all materials, the removal of which is necessary for the proper completion of the work, connecting proposed drainage systems to existing systems, plugging or abandoning existing pipes and removal of existing pipe within trench limits, as shown on the plans or as directed by the Engineer.

This Section shall also include removal of drainage pipes outside of drainage trench excavation limits, as defined in 2.86.03-1.

6.86.02—Materials: The materials for this work shall meet the following requirements: Drainage Pipe, Drainage Pipe Ends, Sealers, Gaskets and connection hardware shall meet the requirements of M.08.01.

Bedding Material shall meet the requirements of M.08.03-1.

Granular Fill, if necessary, shall meet the requirements of M.02.01.

Brick Masonry shall meet the requirements of M.11.03 and Mortar shall meet the requirements of M.11.04.

Concrete used for Concrete Pipe Connections shall be Class “F” Concrete meeting the requirements of M.03.

Where backfill occurs within an existing wetland, no reclaimed material shall be utilized.

6.86.03—Construction Methods:

(1) Drainage Trench Excavation: Drainage trench excavation and backfilling shall be performed in accordance with 2.86.03 and the requirements of the plans.

Where drainage pipe is to be laid below the surface, a drainage trench shall be excavated to the required depth, the bottom of which shall be graded to the elevation of the bottom of the bedding material.

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

(2) Rock in Drainage Trench Excavation: When rock, as defined in 2.86.01-2, is encountered, work shall be performed in accordance with 2.86.03 and the requirements of the plans.

(3) Drainage Pipe Installation: New or re-laid drainage pipes shall be installed on 4 inches of bedding material (12 inches if over rock in ledge formation), the details as shown on the

plans, or as directed by the Engineer. Prior to placement of the drainage pipe, in accordance with the plans, bedding material shall be pre-shaped to 10% of the total height of the pipe in order to keep the pipe in the center of the trench. Following placement of the drainage pipe, bedding material backfill shall be placed in accordance with the following table:

Internal Pipe Diameter	Required Bedding Material Backfill
< 48 inches *	25% of total height of the pipe
≥ 48 inches *	12 inches above the top of the pipe
*Includes pipe arch of equivalent internal horizontal span See Standard Drawing	

The placement of the drainage pipe shall start at the downstream end and progress upstream or as shown on the plans, or as directed by the Engineer. All drainage pipes shall be carefully laid in the center of the drainage trench, true to the lines and grades given. Bell ends shall face upgrade and all joints shall be tight.

Joints in concrete pipe shall be sealed with cold-applied bituminous sealer, preformed plastic gaskets or flexible, watertight, rubber-type gaskets. Portland cement mortar shall not be used for sealing pipe joints except with permission of the Engineer.

When cold-applied bituminous sealer is used, the bell and spigot ends shall be wiped clean and dry before applying the bituminous sealer to the pipe ends. Before the drainage pipes are placed in contact with each other, the spigot or tongue end shall be completely covered with bituminous sealer; then the pipe shall be laid to line and grade so the inside surface of all abutting pipes are flush. Additional bituminous sealer shall be applied to the joint after the connection has been made to ensure a water tight connection.

Where the end of an existing drainage pipe is not compatible with the end of a proposed concrete pipe, the Contractor shall align the inner diameters of the pipes being connected, butt the pipe ends together, and construct a cast-in-place concrete pipe connection, as shown in the plans. Incompatible bell/spigot or tongue/groove ends shall be cut off as required to ensure the interior drainage pipe walls are aligned to provide a smooth transition between the pipes.

Metal pipe and pipe arches shall be carefully joined and firmly clamped together by approved connecting bands, which shall be properly bolted in place before any backfill is placed.

Newly installed drainage pipe which is not in true alignment, or which shows any settlement or distortion, shall be reinstalled in accordance with 1.05.03.

When drainage pipe outside of proposed drainage trench limits is to be removed, it shall be removed to the limits shown on the plans and all remaining pipes shall be plugged with cement masonry.

Where shown on the plans or directed by the Engineer, the Contractor shall plug abandoned existing pipes with cement masonry.

- (4) Drainage Pipe End Installation:** Reinforced concrete drainage pipe ends shall be placed on a prepared bed of the existing ground and accurately aligned as shown on the plans. The joints shall be sealed as specified in 6.86.03-3 and backfill shall be placed around both sides of the unit simultaneously to the elevation shown on the plans.

Metal drainage pipe ends shall be placed on a prepared bed of the existing ground and accurately aligned as shown on the plans. After the attachment of the drainage pipe end, backfill shall be placed around both sides of the unit up to the elevation shown on the plans, exercising caution to avoid displacement or deformation of the unit.

6.86.04—Method of Measurement: This work will be measured as follows:

Drainage Trench Excavation, in accordance with 2.86.04, will not be measured for payment.

Rock in Drainage Trench Excavation will be measured in accordance with 2.86.04.

Bedding Material will not be measured for payment.

New and Re-laid Pipes and Pipe Arches will be measured for payment by the actual number of linear feet of pipe or pipe arch of the various sizes and types, completed and accepted and measured in place along the invert. Coupling bands and fittings for pipes and pipe arches will not be measured for payment.

Reinforced Concrete Drainage Pipe Ends and Metal Drainage Pipe Ends will be measured for payment as separate units.

Corrugated Metal Pipe Elbows (of the Size and Type specified) will be measured for payment by the actual number of linear feet of pipe elbows completed and accepted, based on 6 linear feet per elbow, as shown on the plans. Coupling bands for elbows will not be measured for payment.

Concrete Pipe Connection will be measured for payment by the number of each concrete pipe connection constructed at locations where proposed concrete pipes tie into an existing pipe with an incompatible end, completed and accepted by the Engineer.

Removal of drainage pipe outside of drainage trench excavation limits, as defined in 2.86.03, will be measured for payment by the actual number of linear feet of drainage pipe removed.

There will be no measurement for plugging existing pipes with cement masonry.

6.86.05—Basis of Payment:

Drainage Trench Excavation for the installation of drainage pipes will not be paid separately but shall be included in the Contract unit price for the respective drainage pipe or pipe end item(s), in accordance with the provisions of 2.86.05.

Rock in Drainage Trench Excavation will be paid for in accordance with the provisions of 2.86.05.

Bedding Material necessary for the installation of drainage items described herein will be included in the Contract unit price for the respective drainage pipe or pipe end item(s). Bedding material required to fill voids when rock in drainage trench is encountered will not be measured for payment but shall be included in the Contract unit price for "Rock in Drainage Trench Excavation," in accordance with 2.86.05.

New Pipes and Pipe Arches will be paid for at the Contract unit price per linear foot for "(Size and Type) Pipe (Thickness) – 0' to 10' Deep," "(Size and Type) Pipe (Thickness) – 0' to 20' Deep," "(Size) Pipe Arch (Thickness) – 0' to 10' Deep" or "(Size) Pipe Arch (Thickness) – 0' to

20' Deep" complete in place, including materials, drainage trench excavation, bedding material, equipment, tools, and labor incidental thereto.

Relaid Pipes and Pipe Arches will be paid for at the Contract unit price per linear foot for "Relaid Pipe (Size and Type) – 0' to 10' Deep," "Re-laid Pipe (Size and Type) – 0' to 20' Deep," "Relaid Pipe Arch (Size and Type) – 0' to 10' Deep," or "Relaid Pipe Arch (Size and Type) – 0' to 20' Deep," complete in place, including all materials, drainage trench excavation, bedding material, equipment, tools, and labor incidental thereto.

Reinforced Concrete Drainage Pipe Ends and Metal Drainage Pipe Ends will be paid for at the Contract unit price for each drainage pipe end of the Size and Type specified, complete in place, including all excavation, materials, attachment systems, equipment, tools and labor incidental thereto.

Corrugated Metal Pipe Elbows will be paid for at the Contract unit price per linear foot for "(Size and Type) Corrugated Metal Pipe Elbow" including all materials, drainage trench excavation, bedding material, equipment, tools, and labor incidental thereto.

Concrete Pipe Connection will be paid for at the Contract unit price each for "Concrete Pipe Connection" complete in place, including all materials, equipment, tools and labor incidental thereto.

Removal of drainage pipes of all types and sizes, outside of drainage trench excavation limits, as defined in 2.86.03-1, will be paid for at the Contract unit price per linear foot for "Remove Existing Pipe – 0' to 10' Deep," or "Remove Existing Pipe – 0' to 20' Deep," which price shall include excavation, temporary trench protection, backfill, and all equipment, tools and labor incidental thereto.

There will be no direct payment for the plugging of existing drainage pipes, but the cost thereof shall be included in the respective drainage Contract item(s).

Pay Item	Pay Unit
(Size and Type) Pipe (Thickness) – 0' to 10' Deep	l.f.
(Size and Type) Pipe (Thickness) – 0' to 20' Deep	l.f.
(Size and Type) Pipe Arch (Thickness) – 0' to 10' Deep	l.f.
(Size and Type) Pipe Arch (Thickness) – 0' to 20' Deep	l.f.
Relaid (Size and Type) Pipe– 0' to 10' Deep	l.f.
Relaid (Size and Type) Pipe– 0' to 20' Deep	l.f.
(Size and Type) Relaid Pipe Arch – 0' to 10' Deep	l.f.
(Size and Type) Relaid Pipe Arch – 0' to 20' Deep	l.f.
(Size) Reinforced Concrete Drainage Pipe End	ea.
(Size) Metal Drainage Pipe End	ea.
(Size and Type) Corrugated Metal Pipe Elbow	l.f.
Concrete Pipe Connection	ea.
Remove Existing Pipe – 0' to 10' Deep	l.f.
Remove Existing Pipe – 0' to 20' Deep	l.f.

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

Amend this section as follows:

Article 9.49.01 – Description: *Delete the entire sub article, and replace with the following:*

The work under these items shall consist of furnishing trees, shrubs, vines and ground cover plants, preparation of planting areas, plant layout, planting, staking and guying, fertilizing, watering and mulching as specified in the Contract. It shall also include the continuous maintenance and watering of these items performed as necessary and as specified to ensure their successful long-term establishment throughout the 1-Year establishment period. The Contractor shall maintain all plants in a healthy, vigorous growing condition and shall furnish the replacement of all dead, dying or otherwise unsatisfactory plant materials following the 1-Year inspection as directed by the Engineer before final acceptance of the Contract.

Article 9.49.03 – Construction Methods: *Delete the first paragraph, add replace with the following:*

Construction methods shall be performed in accordance with the details on the landscape plans. A pre-planting meeting shall be held to discuss the material submittals, location of plantings, preparation of soil, time frame of delivery, temporary storage location, Contract specifics and any other incidental procedures relating to these items.

Herbicides and pesticides shall only be applied by those individuals who possess a current Connecticut Commercial Operator Certificate, and any company applying herbicides or pesticides on State property shall be registered with the Connecticut Department of Environmental Protection.

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

1. Planting Season: *Delete the entire sub article, and replace with the following:*

The planting seasons shall be those indicated below, as specified in the Contract or directed by the Engineer. Planting shall not be done if the ground is frozen, covered in snow, or if the soil is in an unsatisfactory condition as determined by the Engineer. Dates below are inclusive.

Deciduous Material

Spring: March 1st to June 15th

Fall: From September 1st until the ground freezes.

Evergreen Material

Spring: March 1st to May 31st

Fall: August 15th to November 15th

9 - Watering: *Before the first sentence, add the following:*

All plants shall be thoroughly watered at the time of planting, one week following the completion of planting, and once every two weeks throughout the growing season, the period from June 1 through October 31.

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

Acceptance of all work under Section 9.49 for full payment in accordance with Article 9.49.05 shall be conditional on the successful completion of a 1-Year Establishment Period, as determined by the Engineer. The 1-Year Establishment Period shall consist of a period of one full calendar year that will begin only after all plant materials specified in the contract have been planted and all initial planting operations have been accepted.

For the duration of this plant Establishment Period, the Contractor shall use all currently accepted horticultural practices necessary to keep all plant material installed in a healthy, vigorous growing condition and ensure their successful long-term establishment. During this entire period, the Contractor shall water and perform any other currently accepted horticultural practices required to maintain the plantings in a healthy, vigorous growing condition. He shall also repair, replace or re-adjust guy wires, stakes, posts and flagging, reshape plant saucers, repair washouts and gullies, replace lost wood chip mulch, and keep all planting sites free from weeds as may be required as determined or directed by the Engineer. Weeding of beds shall occur a minimum of 3 times throughout the contract, with the last occurrence being performed at the time of final replacements or other directed corrective work. At this time, all plant material shall be re-fertilized.

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

After the Contractor has completed all required corrective measures identified at the 1-Year Inspection, the Engineer will inspect the plant establishment for final acceptance.

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.

<u>Field Number</u>	<u>Type</u>	<u>size</u>	<u>Description</u>
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.

SECTION M.03 - PORTLAND CEMENT CONCRETE

Replace Section M.03 in its entirety with the following:

M.03.01—Component Materials

M.03.02—Mix Design Requirements

M.03.03—Producer Equipment and Production Requirements

M.03.04—Curing Materials

M.03.05—Non Shrink, Non Staining Grout

M.03.06—Expansive Cement for Anchoring

M.03.07—Chemical Anchors

M.03.08—Joint Materials

M.03.09—Protective Compound/Sealers

M.03.10—Formwork

M.03.01—Component Materials

1. Coarse Aggregate: Coarse aggregate shall meet the requirements of M.01.

2. Fine Aggregate: Fine aggregate shall meet the requirements of M.01.

3. Cement:

(a) Portland: Types I, II, and III Portland cement shall meet the requirements of AASHTO M 85. Type I and Type III Portland cement shall be used only when required or expressly permitted by the Project specification or the Engineer. The use of Type I or III will require that these mixtures be submitted as Non-standard Mix Designs. All cement shall be provided by a mill participating in the Departments' Cement Certification program. The requirements of the Certification Program are detailed in the Departments' Quality Assurance Program for Materials.

(b) Pre-Blended Cements: Binary or Ternary cements consisting of Portland Cement and supplemental cementitious materials may be used provided that all the requirements of M.03.01- 3(a) and -3(c) are met.

(c) Replacement Materials: Unless already approved as a Standard Mix Design, any Contractor proposed Mix Designs with partial replacement of Portland Cement (PC) with fly ash or ground granulated blast furnace slag (GGBFS), shall be submitted in writing to the Engineer for approval prior to the start of work, on a project-by-project basis. The type of material, source, and the percentage of the PC replaced shall be clearly indicated. Upon request, a Certified Test Report for the cement replacement material shall be provided to the Engineer for use during the Mix Design review.

1. Fly Ash: Fly ash to be used as a partial replacement for Portland cement shall meet the requirements of AASHTO M 295, either Class C or Class F, including the uniformity requirements of Table 2A. Loss on Ignition for either class of fly ash shall not exceed 4.0%. Fly ash may be used to replace up to a maximum of 20% of the required Portland cement for mixes without permeability requirements. For mixes with permeability requirements, the maximum of 20% may be exceeded. The fly ash shall be substituted on a weight basis, with a minimum of 1 lb. of fly ash for 1 lb. of Portland cement. Different classes of fly ash or the same class from different sources shall not be permitted on any single project without the written approval of the Engineer.

2. **Ground Granulated Blast Furnace Slag (GGBFS):** GGBFS used as a partial replacement for Portland cement shall meet the requirements of AASHTO M 302/ASTM C989, Grade 100 or 120. As determined by the Engineer, GGBFS may be used to replace a maximum of 30% of the required Portland cement for mixes without permeability requirements. For mixes with permeability requirements, the maximum of 30% may be exceeded. The Engineer may restrict or prohibit the use of GGBFS if ambient temperatures anticipated during the placement and initial curing of the concrete are low. The GGBFS shall be substituted on a weight basis, with a minimum of 1 lb. of slag for 1 lb. of Portland cement. Different sources of GGBFS shall not be permitted on any single project without the written approval of the Engineer.

4. Water: All water used in the mixing of concrete shall be odorless and clear in appearance. Surface water may be used if not taken from shallow or muddy sources; classified as Class C or Class D on the Department of Energy and Environmental Protection (DEEP) Water Quality Classification mapping; and accommodations have been made to prevent contaminants from entering the supply to the satisfaction of the Engineer. The Engineer may request that water from any surface or ground source be tested in accordance with AASHTO T26 and AASHTO D512 if the appearance or scent of the water is suspect. To be acceptable, the pH of the water must not be less than 6.0 or greater than 8.0 and Chloride Ion Concentration of the water must not exceed 250ppm. Potable water taken directly from a municipal or regional water supply may be used for mixing concrete without testing. Heating or cooling of water may be required to meet mix temperature requirements at time of placement.

5. Admixtures: All admixtures shall perform their function without injurious effects upon the concrete. If requested by the TDC, the Contractor shall present a certified statement from a recognized laboratory attesting to this requirement. A "recognized" laboratory is any cement and concrete laboratory approved and inspected regularly by the Cement and Concrete Reference Laboratory (CCRL). The statement shall contain results of compression tests of cylinder specimens made with concrete utilizing the admixture(s) in proportions equal to those proposed by the Contractor. The results of at least 5 standard 6 inch x 12 inch cylinders of each mix design shall be listed with the results of at least 5 like-sized cylinders not utilizing the admixture(s). Specimens must be made and cured in the laboratory in accordance with AASHTO T 126 and will be tested in accordance with AASHTO T 22.

(a) Air-Entraining Admixtures: In the event that air entrained concrete is required, an admixture meeting the requirements of AASHTO M 154 may be used. Tests for 7 and 28-day compressive and flexural strengths and resistance to freezing and thawing are required whereas tests for bleeding, bond strength and volume change will not be required.

(b) Other Chemical Admixtures: In the event that concrete properties are specified that require the use of additional admixtures, or the Contractor proposes the use of additional admixtures to facilitate placement, the admixtures shall meet the requirements of AASHTO M194M/M, including the 1 year performance data.

M.03.02—Mix Design Requirements

1. Standard ConnDOT Mix Designs: Standard Mix Designs shall be designed in accordance with applicable sections of ACI 211 and ACI 318. The mixtures shall consist of Portland cement, fine aggregate, coarse aggregate, admixtures, and water proportioned in accordance with Table M.03.02-1. The mixtures shall also be designed to obtain the plastic properties of Portland cement concrete as specified in Table 6.01.03-2.

Table M.03.02-1 Standard Portland Cement Concrete Mixes

Class ¹	Max. Water/Cement ² ratio	Min. Cement ² Content - lb./c.y.	Air Content %	Electrical Resistivity (Permeability)
				kΩ-cm AASHTO T 358
PCC0223Z	0.69	455	6 +/- 1.5	NA
PCC0334Z	0.48	615		NA
PCC0336Z	0.50	564		NA
PCC0354Z	0.49	615		NA
PCC0446Z	0.44	658		NA
PCC04462	0.42			29 minimum
PCC0556Z	0.40			NA
PCC05562	0.40			29 minimum
PCCXXX81 ³	0.46		7.5 +/- 1.5	15 maximum
PCCXXX82	0.40			29 minimum

¹ PCCXYZ where:

PCC = Portland Cement Concrete

XXX = 28-day minimum compressive strength (psi/100)

Y = Nominal Maximum Aggregate Size (U.S. Sieve No. Designation)

Z = Exposure Factor (See Table M.03.02-1a)

² Portland Cement may be partially replaced within a Standard Mix Design by other approved cementitious material meeting the requirements of M.03.01-3(c) if permitted by the Engineer.

³ When this class is paid for in a surface or structural repair concrete item, the plastic properties necessary for confined placement to ensure appropriate workability for consolidation within the forms shall be noted on the delivery ticket by the concrete supplier.

Table M.03.02-1a Exposure Factor per Application

Exposure		Application
0	Benign	Elements not exposed to weather (buried, enclosed)
1	Moderate	Elements not in contact with salt water or deicing chemicals
2	Severe	Elements in contact with salt water, deicing chemicals, flowing/standing water

Mix designs shall indicate the dosage of admixtures anticipated to provide plastic properties required in the Project specification. Plastic properties of standard mix classes of concrete in the plastic state are listed in Table 6.01.03-2.

Standard Mix Designs are required to be designed and submitted by the concrete producers, and are approved by the Department on a standing basis. Submittal or re-approval of these Standard Mix Designs on an annual basis is not required. Previously approved producer-designed Standard Mixes that have a record of satisfactory performance may be utilized on Department projects unless there is a change in the gravimetric properties or the sources of any materials. Revisions to the Standard Mix Designs, which include changes in component sources, can be submitted at any time to the TDC, but must be approved prior to use on Department projects.

2. Non-Standard CTDOT Mix Designs: Any proposed Mix Designs that do not comply with Table M.03.02-1 are required to be submitted 15 days prior to use on a project-by-project basis and be approved by the TDC prior to use. The use of an approved admixture with an otherwise approved Standard Mix Design is not considered non-standard.

All Non-standard Mix Designs used for load-bearing structures shall contain a minimum of 658 lb./c.y. of cementitious materials.

Concrete used in applications such as flowable fill or controlled low-strength material may be designed with less than 658 lb./c.y. of cementitious materials.

M.03.03—Producer Equipment and Production Requirements

1. General Requirements: The source of the concrete must be approved by the Engineer prior to use on Department projects. Specifically the location and capacity of the central mix or dry batch plant, and complement of truck mixers/haulers, shall be adequate for continuous placement of concrete on a typical Department project. Approval may be revoked at any time in accordance with 1.06.01.

- (a) Inspection:** The production facility supplying hydraulic cement concrete shall have a current Certification of Ready Mixed Concrete Production Facilities from the National Ready Mixed Concrete Association (NRMCA), or equivalent certification approved by the Engineer.
- (b)** In addition to the requirements of approved third party certification, the facility shall produce batch tickets that meet the requirements of 6.01.03-3(a).
- (c) Quality Control:** The Contractor is responsible for all aspects of Quality Control (QC). As determined by the Engineer, should material delivered to a project not meet specification, the Contractor may be required to submit to the Engineer a corrective procedure for approval within 3 calendar days. The procedure shall address any minor adjustments or corrections made to the equipment or procedures at the facility.
- (d) Suspension:** As determined by the Engineer, repeated or frequent delivery of deficient material to a Department project may be grounds for suspension of that source of material. A detailed QC plan that describes all QC policies and procedures for that facility may be

required to formally address quality issues. This plan must be approved by the Engineer and fully implemented, prior to reinstatement of that facility.

2. Hand Mixed Concrete: Hand mixing shall be permitted only with the permission of the Engineer. Hand mixed batches shall not exceed 1/2 c.y. in volume. Hand mixing will not be permitted for concrete to be placed under water.

M.03.04—Curing Materials

1. Water: Any water source deemed acceptable by the Engineer for mixing concrete may be used to provide water for curing purposes. Surface water may be used if classified as Class C or Class D on the Department of Energy and Environmental Protection (DEEP) Water Quality Classification mapping and accommodations have been made to prevent contaminants from entering the supply to the satisfaction of the Engineer. In general, water shall not be taken from shallow or muddy sources. In cases where sources of supply are relatively shallow, the intake pipe shall be enclosed to exclude silt, mud, grass, etc.; and the water in the enclosure shall be maintained at a depth of not less than 2 feet under the intake pipe.

2. Mats: Mats for curing concrete shall be capable of maintaining moisture uniformly on the surface of the concrete. The mats shall not contain any materials such as dyes, sugar, etc., that may be injurious to the concrete.

The length or width of the mats shall be sufficient to cover all concrete surfaces being cured. Should more than one mat be required, sufficient overlap shall be provided by the Contractor as determined by the Engineer.

3. Liquid Membrane-Forming Compound: Liquid membrane-forming compound shall meet the requirements of AASHTO M 148 Type 2, Class B, or shall be a water-soluble linseed oil-based compound meeting the requirements of AASHTO M 148, Type 2.

4. White Polyethylene Sheeting (Film): White polyethylene sheeting (film) shall meet the requirements of AASHTO M 171.

M.03.05—Non Shrink, Non Staining Grout

1. Bagged (pre-mixed): Bagged (pre-mixed) formulations of non-shrink grout shall meet the requirements of ASTM C1107. The grout shall be mixed with potable water for use. The grout shall be mixed to a flowable consistency as determined by ASTM C230. All bagged material shall be clearly marked with the manufacturer's name, date of production, batch number, and written instructions for proper mixing, placement and curing of the product.

2. Bulk: The Contractor may formulate and design a grout mix for use on the Project in lieu of using a pre-bagged product. The Contractor shall obtain prior written approval of the Engineer for any such proposed Mix Design. Any such Mix Design shall include the proportions of hydraulic cement, potable water, fine aggregates, expansive agent, and any other necessary additive or admixture. This material shall meet all of the same chemical and physical requirements as shall the pre-bagged grout, in accordance with ASTM C1107.

M.03.06—Expansive Cement for Anchoring

The premixed anchoring cement shall be non-metallic, concrete gray in color and prepackaged. The mix shall consist of hydraulic cement, fine aggregate, expansive admixtures and water meeting the following requirements:

1. The anchoring cement shall have a minimum 24 hour compressive strength of 2,600 psi when tested in accordance with ASTM C109.

2. The water content of the anchoring cement shall be as recommended by the manufacturer. Water shall meet the requirements of M.03.01-4.

The Contractor shall provide a Certified Test Report and Materials Certificate for the premixed anchoring cement in accordance with 1.06.07. The Contractor shall also provide, when requested by the Engineer, samples of the premixed anchoring cement for testing and approval.

M.03.07—Chemical Anchors

Chemical anchor material must be listed on the Departments' Qualified Products List and approved by the Engineer for the specified use.

The chemical anchor material shall be epoxy or polyester polymer resin. It shall not contain any metals or other products that promote corrosion of steel. The Contractor shall supply the Engineer with a Certified Test Report and Materials Certificate for the chemical anchor material in accordance with 1.06.07. When requested by the Engineer, the Contractor shall also provide samples of the chemical anchor material.

M.03.08—Joint Materials

1. Transverse Joints for Concrete Pavement: Transverse joints shall consist of corrosion resistant load transfer devices, poured joint seal and in addition, in the case of expansion joints, expansion joint filler all meeting the following requirements:

- (a) The corrosion resistant load transfer device shall be coated steel or sleeved steel or be made of corrosion resistant material. The dimensions of any devices used shall be as shown on the plans, exclusive of any coating or sleeving. Core material of coated or sleeved metallic devices shall be steel meeting the requirements of AASHTO M 255M/M 255 Grade 520, or steel having equal or better properties and approved by the Engineer. Nonmetallic devices shall meet the various strength requirements applicable to metallic devices as well as all other requirements stated herein.
- (b) All coated load transfer devices shall meet the requirements of AASHTO M 254. Uncoated or sleeved load transfer devices shall meet the applicable physical requirements of AASHTO M 254. The use of field applied bond breakers will not be permitted.
- (c) The basis of acceptance for corrosion resistant load transfer devices shall be the submission by the Contractor of a minimum of 2 samples accompanied by Certified Test Reports meeting the requirements of 1.06.07 demonstrating that the load transfer device meets the requirements of AASHTO M 254 for the type of device supplied. The Engineer reserves the right to reject any load transfer device deemed unsatisfactory for use.

2. Joint Filler for Concrete Curbing: Expansion joint filler shall be either preformed expansion joint filler or wood joint filler as indicated on the plans and shall meet the following requirements:

- (a) Preformed expansion joint filler shall be the bituminous cellular type and shall meet the requirements of AASHTO M 213.
- (b) Boards for wood joint filler shall have 2 planed sides and shall be redwood, cypress or white pine. Redwood and cypress boards shall be of sound heartwood. White pine boards shall be of sound sapwood. Occasional small, sound knots and medium surface checks will be permitted provided the board is free of any defects that will impair its usefulness for the purpose intended. The joint filler may be composed of more than one length of board in the length of the joint, but no board of a length less than 6 feet shall be used; and the

separate boards shall be held securely to form a straight joint. Boards composed of pieces that are jointed and glued shall be considered as one board.

- (c) Dimensions shall be as specified or shown on the plans; and tolerances of plus 1/16 inch thickness, plus 1/8 inch depth and plus 1/4 inch length will be permitted.
- (d) All wood joint filler boards shall be given a preservative treatment by brushing with creosote oil meeting the requirements of AASHTO M 133. After treatment, the boards shall be stacked in piles, each layer separated from the next by spacers at least 1/4 inch thick; and the boards shall not be used until 24 hours after treatment. Prior to concreting, all exposed surfaces of the wood filler shall be given a light brush coating of form oil.
- (e) Testing of board expansion joint filler shall be in accordance with pertinent sections of AASHTO T 42.

3. Longitudinal Joint Devices: The metal used in the fabrication of longitudinal joint devices shall meet ASTM requirements for each type of metal used. The dimensions shall be as shown on the plans.

4. Expansion Joint Fillers for Bridges and Bridge Bearings:

- (a) Preformed expansion joint filler for bridges shall meet the requirements of AASHTO M 153, Type I or Type II.
- (b) Pre-molded expansion joint filler for bridge bearings shall meet the requirements of AASHTO M 33.

5. Joint Sealants:

(a) **Joint Sealer for Pavement:** The joint sealer for pavement shall be a rubber compound of the hot-poured type and shall meet the requirements of AASHTO M 324 Type II unless otherwise noted on the plans or in the special provisions.

(b) **Joint Sealer for Structures:** Structure joint sealers shall be one of the following type sealants:

1. Where "Joint Seal" is specified on the plans, it shall meet the requirements of the Federal Specifications SS-S-200-E (Self-leveling type), TT-S-0227E (COM-NBS) Type II-Class A (Non-sag type), or 1 component polyurethane-base elastomeric sealants conforming to FS TT-S-00230C Type II-Class A or an approved equal.

A Certified Test Report will be required in accordance with 1.06.07, certifying that the sealant meets the requirements set forth in the Federal Specification. Should the consignee noted on a Certified Test Report be other than the Prime Contractor, a Materials Certificate shall be required to identify the shipment.

2. Where "Silicone Joint Sealant" is specified on the plans, it shall be one of the following or an approved equal:
 - i. Sealant, manufactured by the Dow Corning Corporation, Midland, Michigan 48686-0994
 - ii. Dow Corning 888 Silicone Joint Sealant or
 - iii. Dow Corning 888-SL Self-Leveling Silicone Joint 48686-0994

6. Closed Cell Elastomer: The closed cell elastomer shall meet the requirements of ASTM D1056, Grade RE-41 B2. The elastomer shall have a pressure-sensitive adhesive backing on one side.

The Contractor shall deliver the closed cell elastomer to the job site a minimum of 30 days prior to installation. Prior to the delivery of the closed cell elastomer, the Contractor shall notify the Engineer of the date of shipment and the expected date of delivery. Upon delivery of the closed cell elastomer to the job site, the Contractor shall immediately notify the Engineer.

Each separate length, roll or container shall be clearly tagged or marked with the manufacturer's name, trademark and lot number. A lot is defined as that amount of closed cell elastomer manufactured at 1 time from 1 batch of elastomer. A batch is defined as that amount of elastomer prepared and compounded at 1 time. The Contractor shall furnish a Certified Test Report in accordance with 1.06.07, confirming that the closed cell elastomer meets the requirements set forth in these specifications. Should the co-signee noted on a Certified Test Report be other than the Prime Contractor, a Materials Certificate shall be required to identify shipment.

The Contractor shall furnish a 1 foot length of closed cell elastomer in each lot for purposes of inspection and testing by the Engineer. The Engineer will cut a 1 foot sample from each lot and inspect the sample for conformance to size, and perform physical tests on the sample as deemed necessary.

The Engineer shall reject any lot or portion of a lot that does not meet the requirements stated herein. A rejected lot or portion of a lot may be resubmitted provided the Contractor has removed or corrected, in a manner acceptable to the Engineer, all non-conforming material.

M.03.09—Protective Compound/Sealers

The brand and type of material must be listed on the Department's Qualified Products List and approved by the Engineer for the specified use.

M.03.10—Formwork

1. Stay-in-place Forms: Material for stay-in-place metal forms shall be made of zinc-coated (galvanized) steel sheet meeting ASTM Specification A653 (Structural Steel (SS) Grade 33 through 80). The minimum thickness shall be 20 gauge. Coating weight shall meet the requirements of ASTM A924, Class G235, and shall otherwise meet all requirements relevant to steel stay-in-place metal forms and the placing of concrete as specified herein and as noted in the Contract.

Form supports shall either be fabricated and meet the same material requirements as the forms, or be fabricated from structural steel meeting the requirements of ASTM A36 and shall be hot-dip galvanized in accordance with ASTM A123.

Lightweight filler material for forms shall be as recommended by the form manufacturer.

2. Temporary Forms and Falsework: Forms and Falsework shall be of wood, steel or other material approved by the Engineer. This approval does not relieve the Contractor from employing adequately sized materials of sufficient rigidity to prevent objectionable distortion of the formed concrete surfaces caused by pressure of the plastic concrete and other loads incidental to the construction operations.

SECTION M.04 - BITUMINOUS CONCRETE MATERIALS

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

M.04.01—Bituminous Concrete Materials and Facilities

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

M.04.03—Production Requirements

M.04.01—Bituminous Concrete Materials and Facilities: Each source of material, Plant, and laboratory used to produce and test bituminous concrete must be qualified on an annual basis by the Engineer. AASHTO or ASTM Standards noted with an (M) have been modified and are detailed in Table M.04.03-5.

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

1. Coarse Aggregate: All coarse aggregate shall meet the requirements listed in M.01.

2. Fine Aggregate: All fine aggregate shall meet the requirements listed in M.01.

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

4. Performance Graded (PG) Asphalt Binder:

(a) General:

- i. PG asphalt binder shall be uniformly mixed and blended and be free of contaminants such as fuel oils and other solvents. Binder shall be properly heated and stored to prevent damage or separation.
- ii. The binder shall meet the requirements of AASHTO M 332 and shall be graded or verified in accordance with AASHTO R 29. The Contractor shall submit a Certified Test Report and bill of lading representing each delivery in accordance with AASHTO R 26(M). The Certified Test Report must also indicate the binder specific gravity at 77°F; rotational viscosity at 275°F and 329°F; and the mixing and compaction viscosity-temperature chart for each shipment.
- iii. The Contractor shall submit the name(s) of personnel responsible for receipt, inspection, and record keeping of PG binder. Contractor Plant personnel shall document specific storage tank(s) where binder will be transferred and stored until used and provide binder samples to the Engineer upon request. The person(s) shall assure that each shipment is accompanied by a statement certifying that the transport vehicle was inspected before loading was found acceptable for the material shipped and that the binder is free of contamination from any residual material, along with 2 copies of the bill of lading.
- iv. The blending or combining of PG binders in 1 storage tank at the Plant from different suppliers, grades, or additive percentages is prohibited.

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

(c) Standard Performance Grade (PG) Binder:

- i. Standard PG binder shall be defined as “Neat.” Neat PG binders shall be free from modification with: fillers, extenders, reinforcing agents, adhesion promoters,

thermoplastic polymers, acid modification and other additives such as re-refined motor oil, and shall indicate such information on each bill of lading and Certified Test Report.

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

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

(e) Warm Mix Additive or Technology:

- i. The warm mix additive or technology must be listed on the North East Asphalt User Producer Group (NEAUPG) Qualified Warm Mix Asphalt (WMA) Technologies List at the time of bid, which may be accessed online at <http://www.neaupg.uconn.edu>.
- ii. The warm mix additive shall be blended with the asphalt binder in accordance with the manufacturer's recommendations.
- iii. The blended binder shall meet the requirements of AASHTO M 332 and shall be graded or verified in accordance with AASHTO R 29 for the specified binder grade. The Contractor shall submit a Certified Test Report showing the results of the testing demonstrating the binder grade. In addition, it must include the grade of the virgin binder, the brand name of the warm mix additive, the manufacturer's suggested rate for the WMA additive, the water injection rate (when applicable), and the WMA Technology manufacturer's recommended mixing and compaction temperature ranges.

5. Emulsified Asphalts:

(a) General:

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

(b) Basis of Approval:

- i. The request for approval of the source of supply shall list the location where the material is manufactured, the handling and storage methods, and certifications in accordance with AASHTO R 77. Only suppliers that have an approved "Quality Control Plan for Emulsified Asphalt" formatted in accordance with AASHTO R 77 and that submit monthly split samples per grade to the Engineer may supply emulsified asphalt to Department projects.
- ii. Each shipment of emulsified asphalt delivered to the Project site shall be accompanied with the corresponding Certified Test Report listing Saybolt viscosity, residue by evaporation, penetration of residue, and weight per gallon at 77°F and Material Certificate.
- iii. Anionic emulsified asphalts shall meet the requirements of AASHTO M-140. Materials

used for tack coat shall not be diluted and meet grade RS-1 or RS-1h. When ambient temperatures are 80°F and rising, grade SS-1 or SS-1h may be substituted if permitted by the Engineer.

- iv. Cationic emulsified asphalt shall meet the requirements of AASHTO M-208. Materials used for tack coat shall not be diluted and meet grade CRS-1. The settlement and demulsibility test will not be performed unless deemed necessary by the Engineer. When ambient temperatures are 80°F and rising, grade CSS-1 or CSS-1h may be substituted if permitted by the Engineer.

6. Reclaimed Asphalt Pavement (RAP):

(a) General: RAP is a material obtained from the cold milling or removal and processing of bituminous concrete pavement. RAP material shall be crushed to 100% passing the 1/2 inch sieve and free from contaminants such as joint compound, wood, plastic, and metals.

(b) Basis of Approval: The RAP material will be accepted on the basis of one of the following criteria:

- i. When the source of all RAP material is from pavements previously constructed on Department projects, the Contractor shall provide a Materials Certificate listing the detailed locations and lengths of those pavements and that the RAP is only from those locations listed.
- ii. When the RAP material source or quality is not known, the Contractor shall request approval from the Engineer at least 30 calendar days prior to the start of the paving operation. The request shall include a Material Certificate and applicable test results stating that the RAP consists of aggregates that meet the specification requirements of M.04.01-1 through M.04.01-3 and that the binder in the RAP is substantially free of solvents, tars and other contaminants. The Contractor is prohibited from using unapproved material on Department projects and shall take necessary action to prevent contamination of approved RAP stockpiles. Stockpiles of unapproved material shall remain separate from all other RAP materials at all times. The request for approval shall include the following:
 - 1. A 50-lb. sample of the RAP to be incorporated into the recycled mixture.
 - 2. A 25-lb. sample of the extracted aggregate from the RAP.

7. Crushed Recycled Container Glass (CRCG):

(a) Requirements: The Contractor may propose to use clean and environmentally-acceptable CRCG in an amount not greater than 5% by weight of total aggregate.

(b) Basis of Approval: The Contractor shall submit to the Engineer a request to use CRCG. The request shall state that the CRCG contains no more than 1% by weight of contaminants such as paper, plastic, and metal and conforms to the following gradation:

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

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

8. Joint Seal Material: Joint seal material must meet the requirements of ASTM D6690 - Type 2. The Contractor shall submit a Material Certificate in accordance with 1.06.07 certifying that the joint seal material meets the requirements of this Section.

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

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

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

10. Plant Requirements:

(a) General: The Plant producing bituminous concrete shall comply with AASHTO M 156.

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

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

*Not to exceed HMA limits

(c) Documentation System: The mixing Plant documentation system shall include equipment for accurately proportioning the components of the mixture by weight and in the proper order, controlling the cycle sequence, and timing the mixing operations. Recording equipment shall monitor the batching sequence of each component of the mixture and produce a printed record of these operations on each Plant ticket, as specified herein.

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

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

For drum Plants, the Plant ticket shall be produced at 5 minute intervals and maintained by the vendor for a period of 3 years after the completion of the Project.

For batch Plants, the Plant ticket shall be produced for each bath and maintained by the vendor for a period of 3 years after the completion of the Project. In addition, an asterisk (*)

shall be automatically printed next to any individual batch weight(s) exceeding the following tolerances:

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

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

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

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

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

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

(f) RAP: RAP moisture content shall be determined a minimum of twice daily (prior to production and halfway through production).

(g) Asphalt Binder: A binder log shall be submitted to the Department’s Central Lab on a monthly basis.

(h) Warm mix additive: For mechanically foamed WMA, the water injection rate shall be monitored during production and not exceed 2.0% by total weight of binder. For additive added at the Plant, the dosage rate shall be monitored during production.

(i) Testing Laboratory: The Contractor shall maintain a laboratory to test bituminous concrete mixtures during production. The laboratory shall have a minimum of 300 s.f., have a potable water source and drainage in accordance with the CT Department of Public Health Drinking Water Division, and be equipped with all necessary testing equipment as well as with a PC, printer, and telephone with a dedicated hard-wired phone line. In addition, the PC shall have a high speed internet connection and a functioning web browser with unrestricted access to <https://ctmail.ct.gov> . This equipment shall be maintained in working order at all times and be made available for use by the Engineer.

The laboratory shall be equipped with a heating system capable of maintaining a minimum temperature of 65°F. It shall be clean and free of all materials and equipment not associated with the laboratory. Sufficient light and ventilation must be provided. During summer months

adequate cooling or ventilation must be provided so the indoor air temperature shall not exceed the ambient outdoor temperature.

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

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

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

1. Curb Mix:

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

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

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

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

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

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

Mix	Curb Mix	Production Tolerances from JMF Target
Grade of PG Binder content %	PG 64S-22 6.5 - 9.0	0.4
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		
Binder	325°F maximum	
Aggregate	280-350°F	
Mixtures	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 bituminous asphalt binder.		

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

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

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

All bituminous concrete mixes shall be tested for stripping susceptibility by performing the TSR test procedure in accordance with AASHTO T 283(M) at a minimum every 36 months. The compacted specimens may be fabricated at the Plant and then tested at an AMRL accredited facility. A minimum of 45000 grams of laboratory or plant blended mixture and the

corresponding complete Form MAT-412s shall be submitted to the Division of Material Testing (DMT) for design TSR testing verification. The mixture submitted shall be representative of the corresponding mix design as determined by the Engineer.

- i. Superpave Mixtures with RAP: RAP may be used with the following conditions:
 - RAP amounts up to 15% may be used with no binder grade modification.
 - RAP amounts up to 20% may be used provided a new JMF is approved by the Engineer. The JMF submittal shall include the grade of virgin binder added. The JMF shall be accompanied by a blending chart and supporting test results in accordance with AASHTO M 323 Appendix X1, or by testing that shows the combined binder (recovered binder from the RAP, virgin binder at the mix design proportions, warm mix asphalt additive and any other modifier if used) meets the requirements of the specified binder grade.
 - Two (2) representative samples of RAP shall be obtained. Each sample shall be split, and 1 split sample shall be tested for binder content in accordance with AASHTO T 164 and the other in accordance with AASHTO T 308.
 - RAP material shall not be used with any other recycling option.
- ii. Superpave Mixtures with RAS: RAS may be used solely in HMA S1 mixtures with the following conditions:
 - RAS amounts up to 3% may be used.
 - RAS total binder replacement up to 15% may be used with no binder grade modification.
 - RAS total binder replacement up to 20% may be used provided a new JMF is approved by the Engineer. The JMF submittal shall include the grade of virgin binder added. The JMF shall be accompanied by a blending chart and supporting test results in accordance with AASHTO M 323 Appendix X1, or by testing that shows the combined binder (recovered binder from the RAP, virgin binder at the mix design proportions, warm mix asphalt additive and any other modifier if used) meets the requirements of the specified binder grade.
 - Superpave Mixtures with RAS shall meet AASHTO PP 78 design considerations.
- iii. Superpave Mixtures with CRCG: CRCG may be used solely in HMA S1 mixtures. One percent (1%) of hydrated lime, or other accepted non-stripping agent, shall be added to all mixtures containing CRCG. CRCG material shall not be used with any other recycling option.
- (b) Basis of Approval: The following information must be included in the JMF submittal:
 - i. Gradation, consensus properties and specific gravities of the aggregate, RAP or RAS.
 - ii. Average asphalt content of the RAP or RAS by AASHTO T 164.
 - iii. Source of RAP or RAS and percentage to be used.
 - iv. Warm mix Technology, manufacturer's recommended additive rate and tolerances, and manufacturer recommended mixing and compaction temperatures.
 - v. TSR test report and anti-strip manufacturer and recommended dosage rate if applicable.
 - vi. Mixing and compaction temperature ranges for the mix with and without the warm-mix technology incorporated.
 - vii. JMF ignition oven correction factor by AASHTO T 308.

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

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

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

Any material based on a JMF, once approved, shall only be acceptable for use when it is produced by the designated Plant, it utilizes the same components, and the production of material continues to meet all criteria as specified in Tables M.04.02-2, M.04.02-3 and M.04.02-4. A new JMF must be submitted to the Engineer for approval whenever a new component source is proposed.

Only 1 mix with 1 JMF will be approved for production at a time. Switching between approved JMF mixes with different component percentages or sources of supply is prohibited.

TABLE M.04.02-2: Superpave Master Range for Bituminous Concrete Mixture Design Criteria

Sieve	S0.25		S0.375		S0.5		S1	
	Control Points		Control Points		Control Points		Control Points	
inches	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)
2.0	-	-	-	-	-	-	-	-
1.5	-	-	-	-	-	-	100	-
1.0	-	-	-	-	-	-	90	100
3/4	-	-	-	-	100	-	-	90
1/2	100	-	100	-	90	100	-	-
3/8	97	100	90	100	-	90	-	-
No. 4	72	90	-	72	-	-	-	-
No. 8	32	67	32	67	28	58	19	45
No. 16	-	-	-	-	-	-	-	-
No. 30	-	-	-	-	-	-	-	-
No. 50	-	-	-	-	-	-	-	-
No. 100	-	-	-	-	-	-	-	-
No. 200	2.0	10.0	2.0	10.0	2.0	10.0	1.0	7.0
VMA (%)	16.5 ± 1		16.0 ± 1		15.0 ± 1		13.0 ± 1	
VA (%)	4.0 ± 1		4.0 ± 1		4.0 ± 1		4.0 ± 1	
Gse	JMF value		JMF value		JMF value		JMF value	
Gmm	JMF ± 0.030		JMF ± 0.030		JMF ± 0.030		JMF ± 0.030	
Dust / effective binder	0.6 - 1.2		0.6 - 1.2		0.6 - 1.2		0.6 - 1.2	
TSR	≥ 80%		≥ 80%		≥ 80%		≥ 80%	
T-283 Stripping	Minimal as determined by the Engineer							

(c) Mix Status: Each facility will have each type of bituminous concrete mixture rated based on the results of the previous year of production. Mix status will be provided to each bituminous concrete Producer prior to the beginning of the paving season.

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

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

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

The final rating assigned will be the lower of the rating obtained with Criteria A or Criteria B. Mix status is defined as:

“A” – Approved: Assigned to each mixture type from a production facility with a current rating of 70% or greater, or to each mixture type completing a successful PPT.

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

1. there are no compliant acceptance production test results submitted to the Department from the previous year;
2. there is a source change in one or more aggregate components;
3. there is a component percentage change of more than 5% by weight;
4. there is a change in RAP percentage;
5. the mixture has a rating of less than 70% from the previous season;
6. it is a new JMF not previously submitted; or
7. the average of 10 consecutive acceptance results for VFA, Density to N_{ini} or dust to effective binder ratio does not meet the criteria in tables M.04.02-2 and M.04.02-4.

Bituminous concrete mixtures rated with a “PPT” status cannot be used on Department projects. Testing shall be performed by the Producer with NETTCP certified personnel on material under this status. Test results must confirm that specification requirements in Tables M.04.02-2 through M.04.02-4 are met and the binder content (Pb) meets the requirements in Table M.04.03-2 before material can be used. One of the following methods must be used to verify the test results:

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

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

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

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

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

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

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

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

Notes:
⁽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 (million)	Number of Gyration by Superpave Gyratory Compactor			Percent Density of Gmm from HMA/WMA Specimen			Voids Filled with Asphalt (VFA) Based on Nominal Mix Size - Inch			
		N _{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	70-80	70-80	70-80	67-80
2	0.3 to <3.0	7	75	115	≤90.5	96.0	≤98.0	65-78	65-78	65-78	65-78
3	≥3.0	7	75	115	≤90.0	96.0	≤98.0	65-77	65-76	65-75	65-75

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

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 bituminous concrete production process. The control chart(s) shall be submitted to the Engineer the first day of each month.

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

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

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

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

2. Acceptance Requirements:

(a) General:

For those mixes with a total estimated project tonnage over 500 tons, a NETTCP HMA Paving Inspector certified Contractor representative shall obtain a field sample of the material placed at the project site in accordance with AASHTO T 168 using the procedure indicated in Section 5.2.3 or an alternate procedure approved by the Engineer. Sampling from the truck at the Plant in accordance with AASHTO T 168 using the procedure indicated in Section 5.2.2 will be allowed for those mixes with a total estimated project tonnage equal to or less than 500 tons. Regardless of sampling location, the sample shall be quartered by the Contractor in accordance with AASHTO R 47 and placed in an approved container. The container shall be sealed with a security tape provided by the Department and labelled to include the project number, date of paving, mix type, lot and subplot numbers and daily tonnage. The minimum weight of each quartered sample shall be 14000 grams. The Contractor shall transport one of the containers to the Departments Central Laboratory in Rocky Hill, retain one of the sealed containers for potential use in dispute resolution and test the remaining samples for acceptance in accordance with past practice.

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

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

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

Should the Department be unable to validate the Contractor's acceptance test result(s) for a lot of material, the Engineer will use results from verification testing and re-calculate the pay adjustment for that lot. The Contractor may request to initiate the dispute resolution process in writing within 24 hours of receiving the adjustment and must include supporting documentation or test results to justify the request.

(b) Curb Mix Acceptance Sampling and Testing Procedures: Curb Mixes shall be tested by the Contractor at a frequency of 1 test per every 250 tons of cumulative production, regardless of the day of production.

When these mix designs are specified, the following acceptance procedures and AASHTO test methods shall be used:

TABLE M.04.03-1: Curb Mix Acceptance Test Procedures

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

Notes: ⁽¹⁾ One (1) set equals 2 each of 6-inch molds. Molds to be compacted to 50 gyrations.
⁽²⁾ Once per year or when requested by the Engineer.

- i. Determination of Off-Test Status:
 1. Curb Mix is considered “off test” when the test results indicate that any single value for bitumen content or gradation are not within the tolerances shown in Table M.04.02-1 for that mixture. If the mix is “off test,” the Contractor must take immediate actions to correct the deficiency and a new acceptance sample shall be tested on the same day or the following day of production.
 2. When multiple silos are located at 1 site, mixture supplied to 1 project is considered as coming from 1 source for the purpose of applying the “off test” status.
 3. The Engineer may cease supply from the Plant when test results from 3 consecutive samples are not within the JMF tolerances or the test results from 2 consecutive samples not within the control points indicated in Table M.04.02-1 regardless of production date.
 - ii. JMF Revisions
 1. If a test indicates that the bitumen content or gradation are outside the tolerances, the Contractor may make a single JMF revision as allowed by the Engineer prior to any additional testing. Consecutive test results outside the requirements of Table M.04.02-1 JMF tolerances may result in rejection of the mixture.
 2. Any modification to the JMF shall not exceed 50% of the JMF tolerances indicated in Table M.04.02-1 for any given component of the mixture without approval of the Engineer. When such an adjustment is made to the bitumen, the corresponding production percentage of bitumen shall be revised accordingly.
- (c) Superpave Mix Acceptance:
- i. Sampling and Testing Procedures

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

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

Production Sub Lot:

 - For Non-PWL: As defined in Table M.04.03-2
 - For PWL: 500 tons (The last sub lot may be less than 500 tons.)

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

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

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

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

One (1) acceptance sample shall be obtained and tested per sub lot with quantities over 125 tons. The Engineer may direct that additional acceptance samples be obtained. For non-PWL lots, one (1) acceptance test shall always be performed in the last sub lot based on actual tons of material produced.

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

The payment adjustment will be calculated as described in 4.06.

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

Daily Quantity Produced in Tons (Lot)	Number of Sub Lots/Tests
0 to 125	0, Unless requested by the Engineer
126 to 500	1
501 to 1,000	2
1,001 to 1,500	3
1,500 or greater	1 per 500 tons or portions thereof

The following test procedures shall be used for acceptance:

TABLE M.04.03-3: Superpave Acceptance Testing Procedures

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

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

⁽²⁾ Average value of 1 set of 6-inch molds.

If the average ignition oven corrected binder content differs by 0.3% or more from the average of the Plant ticket binder content in 5 consecutive tests regardless of the production date (moving average), the Contractor shall immediately investigate, determine an assignable cause, and correct the issue. When 2 consecutive moving average differences are 0.3% or more and no assignable cause has been established, the Engineer may require a new ignition oven aggregate correction factor to be performed or to adjust the current factor by the average of the differences between the corrected binder content and production Plant ticket for the last 5 acceptance results.

The Contractor shall perform TSR testing within 30 days after the start of production for all design levels of HMA- and PMA- S0.5 Plant-produced mixtures, in accordance with AASHTO T 283(M). The TSR test shall be performed at an AMRL certified laboratory by NETTCP certified technicians. The compacted specimens may be fabricated at the Plant and then tested at an AMRL accredited facility. A minimum of 45000 grams of plant blended mixture and the corresponding complete Form MAT-412s shall be submitted to the DMT for production TSR testing verification. The mixture submitted shall be representative of the corresponding mix design as determined by the Engineer. Additionally, the TSR test report and tested specimens shall be submitted to the Engineer for review. Superpave mixtures that require anti-strip additives (either liquid or mineral) shall continue to meet all requirements specified herein for binder and bituminous concrete. The Contractor shall submit the name, manufacturer, percent used, technical datasheet and SDS for the anti-strip additive (if applicable) to the Engineer.

i. Determination of Off-Test Status:

1. Superpave mixes shall be considered “*off test*” when any control point sieve, binder content, VA, VMA, and Gmm value is outside of the limits specified in Table M.04.03-4 or the target binder content at the Plant is below the minimum binder

content stated in Table M.04.02-5. Note that further testing of samples or portions of samples not initially tested for this purpose cannot be used to change the status.

2. Any time the bituminous concrete mixture is considered off-test:
 - A. The Contractor shall notify the Engineer when the Plant is “*off test*” for any mix design that is delivered to the Project in any production day. When multiple silos are located at 1 site, mixture supplied to 1 project is considered as coming from 1 source for the purpose of applying the “*off test*” determination.
 - B. The Contractor must take immediate actions to correct the deficiency, minimize “*off test*” production to the Project, and obtain an additional Process Control (PC) test after any corrective action to verify production is in conformance with the specifications. A PC test will not be used for acceptance and is solely for the use of the Contractor in its quality control process.

ii. Cessation of Supply for Superpave Mixtures in Non-PWL Lots:

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

1. four (4) consecutive tests in any combination of VA, VMA or Gmm, regardless of date of production, or
2. two (2) consecutive tests in the control point sieves in 1 production shift.

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

iii. JMF revisions:

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

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

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

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

TABLE M.04.03-4: Superpave Mixture Production Requirements

	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		0.3 ⁽³⁾
VMA (%)	16.5		16.0		15.0		13.0		1.0 ⁽⁴⁾
VA (%)	4.0		4.0		4.0		4.0		1.0 ⁽⁵⁾
Gmm	JMF value		JMF value		JMF value		JMF value		0.030
Mix Temp. – HMA ⁽⁶⁾	265-325°F ⁽¹⁾		265-325°F ⁽¹⁾		265-325°F ⁽¹⁾		265-325°F ⁽¹⁾		
Mix Temp. – PMA ⁽⁶⁾	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		Minimal TBD by the Engineer		N/A		

Notes: ⁽¹⁾ 300°F minimum after October 15.

⁽²⁾ JMF tolerances shall be defined as the limits for production compliance.

⁽³⁾ 0.4 for PWL lots

⁽⁴⁾ 1.3 for all PWL lots except S/P 0.25 mixes. 1.1 for S/P 0.25 Non-PWL lots. 1.4 for S/P 0.25 PWL lots

⁽⁵⁾ 1.2 for PWL lots

⁽⁶⁾ Also applies to placement

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

AASHTO Standard Method of Test	
Reference	Modification
T 30	Section 7.2 through 7.4 Samples are not routinely washed for production testing
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	<p>All laboratory technician(s) responsible for testing PG binders shall be certified or Interim Qualified by NETTCP as a PG Asphalt Binder Lab Technician.</p> <p>All laboratories testing binders for the Department are required to be accredited by the AMRL.</p> <p>Sources interested in being approved to supply PG binders to the Department by use of an "in-line blending system" must record properties of blended material and additives used.</p> <p>Each source of supply of PG binder must indicate that the binders contain no additives used to modify or enhance their performance properties. Binders that are manufactured using additives, modifiers, extenders, etc., shall disclose the type of additive, percentage and any handling specifications or limitations required.</p> <p>All AASHTO M 320 references shall be replaced with AASHTO M 332.</p> <p>Once a month, 1 split sample and test results for each asphalt binder grade and each lot shall be submitted by the PG binder supplier to the Department's Central Lab. Material remaining in a certified lot shall be re-certified no later than 30 days after initial certification. Each April and September, the PG binder supplier shall submit test results for 2 BBR tests at 2 different temperatures in accordance with AASHTO R 29.</p>

SECTION M.06 - METALS

Section M.06 is amended as follows:

M.06.01—Reinforcing Steel:

Delete the entire last paragraph in Subarticle 1 "Bar Reinforcement" that reads: "Prior to the incorporation... ..and type of bar reinforcement."

M.06.02—Structural Steel:

Revise Subarticle 2 "Anchor Bolts" as follows:

"(a) Anchor bolt assemblies shall meet the requirements of ASTM F1554, and the grade shall be as specified on the plans. All components of the bolt assembly shall be galvanized in accordance with ASTM F2329."

Replace Subarticle 3 "High Strength Bolts" with the following:

" **3. High-Strength Bolts:** High-strength bolts, including suitable nuts and hardened washers, shall meet the following requirements:

- (a) High-strength bolts shall meet the requirements of ASTM F3125 Grade A325 or ASTM F3125 Grade A490 as shown on the plans. High-strength bolts used with coated steel shall be mechanically galvanized, unless otherwise specified. High-strength bolts used with uncoated weathering grades of steel shall be Type 3.

Nuts for ASTM F3125 Grade A325 bolts shall meet the requirements of ASTM A563, Grades DH, DH3, C, C3 and D. Where galvanized high-strength bolts are used, the nuts shall be galvanized, heat-treated Grade DH. Where Type 3 high-strength bolts are used, the nuts shall be Grade C3 or DH3.

Nuts for ASTM F3125 Grade A490 bolts shall meet the requirements of ASTM A563, Grade DH. Where Type 3 high-strength bolts are used, the nuts shall be Grade DH3.

All galvanized nuts shall be lubricated with a lubricant containing a visible dye of any color that contrasts with the color of the galvanizing. Black bolts must be oily to the touch when delivered and installed.

Circular flat and square or rectangular beveled, hardened steel washers shall meet the requirements of ASTM F436. Unless otherwise specified, galvanized washers shall be furnished when galvanized high-strength bolts are specified, and washers with atmospheric corrosion resistance and weathering characteristics shall be furnished when Type 3 high-strength bolts are specified.

Compressible-washer-type direct tension indicator washers, used in conjunction with high-strength bolts, shall meet the requirements of ASTM F959. Where galvanized high-strength bolts are used, the washers shall be galvanized in accordance with ASTM B695,

Class 55. Where Type 3 high-strength bolts are used, the washers shall be galvanized in accordance with ASTM B695, Class 55 and coated with epoxy.

- (b) Identifying Marks:** ASTM F3125 Grade A325 for bolts and the specifications referenced therein for nuts require that bolts and nuts manufactured to the specification be identified by specific markings on the top of the bolt head and on one face of the nut. Markings may be raised or depressed at the manufacturer's option and shall be visible after coating if coating is required. Head markings must identify the grade by the symbol "A325," the manufacturer and the type, if Type 3. Nut markings must identify the grade, the manufacturer and if Type 3, the type. Markings on direct tension indicators must identify the manufacturer and Type "A325." Other washer markings must identify the manufacturer and if Type 3, the type.

ASTM F3125 Grade A490 for bolts and the specifications referenced therein for nuts require that bolts and nuts manufactured to the specifications be identified by specific markings on the top of the bolt head and on one face of the nut. Markings may be raised or depressed at the manufacturer's option and shall be visible after coating if coating is required. Head markings must identify the grade by the symbol "A490," the manufacturer and the type, if Type 3. Nut markings must identify the grade, the manufacturer and if Type 3, the type. Markings on direct tension indicators must identify the manufacturer and Type "A490." Other washer markings must identify the manufacturer and if Type 3, the type.

ASTM F3125 Grade A325 and ASTM F3125 Grade A490 bolt lengths up to 4 times the diameter which are fully threaded but which are not required to be fully threaded by the relevant ASME standard shall be marked with a "T" immediately after the grade designation, for example "A325T." Bolts with any other non-standard dimensions, including thread length, shall be marked with an "S" immediately after the grade designation, for example "A325S." All other markings, if used, such as a private label distributor's mark shall also be separate and distinct.

- (c) Dimensions:** Bolt and nut dimensions shall meet the requirements for Heavy Hexagon Structural Bolts and for Heavy Semi-Finished Hexagon Nuts given in ASME Standard B18.2.6.
- (d) Galvanized Bolts:** Galvanized bolts shall meet the requirements of ASTM F3125 Grade A325, Type 1. The bolts shall be hot-dip galvanized in accordance with ASTM F2329, to a thickness of 50 μm or mechanically galvanized in accordance with ASTM B695, Class 55. Bolts, nuts, and washers of any assembly shall be galvanized by the same process. The nuts shall be overtapped to the minimum amount required for the fastener assembly, and shall be lubricated with a lubricant containing a visible dye so a visual check can be made for the lubricant at the time of field installation. Galvanized bolts shall be tension tested after galvanizing. ASTM F3125 Grade A490 bolts shall be uncoated or shall be coated in accordance with either ASTM F1136 Grade 3 or ASTM F2833 Grade 1.
- (e) Test Requirements:** The maximum hardness of ASTM F3125 Grade A325 bolts shall be 34 HRC. The maximum hardness of ASTM F3125 Grade A490 bolts shall be 38 HRC. Plain, ungalvanized nuts shall have a minimum hardness of 89 HRB.

Proof load tests, in accordance with the requirements of ASTM F606 Method 1, shall be required for the bolts. Wedge tests of full-size bolts are required in accordance with Section 10.1 of ASTM F3125. Galvanized bolts shall be wedge tested after galvanizing.

Proof load tests of ASTM A563 are required for nuts. Proof load tests for nuts used with galvanized bolts shall be performed after galvanizing, overtapping and lubricating.

Rotational-capacity tests are required and shall be performed on all plain or galvanized (after galvanizing) bolt, nut and washer assemblies by the manufacturer or distributor prior to shipping and by the Contractor at the Site.

The thickness of galvanizing on bolts, nuts and washers shall be measured. On bolts, it shall be measured on the wrench flats or on top of the bolt head, and on nuts it shall be measured on the wrench flats.

- (f) Certified Test Reports and Materials Certificates:** The Contractor shall submit notarized copies of Certified Test Reports and Materials Certificates in accordance with Article 1.06.07 for fastener assemblies. In addition the Certified Test Reports and Materials Certificates shall include the following:
1. Mill test reports shall indicate the place where the material was melted and manufactured.
 2. Test reports for proof load tests, wedge tests, and rotational-capacity tests shall indicate where the tests were performed, date of tests, location of where the components were manufactured and lot numbers.
 3. The test report for galvanized components shall indicate the thickness of the galvanizing.
- (g) Material Samples:** Prior to incorporation into the work, the Contractor shall submit samples of the bolt assemblies to the Engineer for testing in accordance with the latest edition of the "[Materials Testing Manual](#) (Chapter 8, Minimum Schedule for Acceptance Testing)." Samples shall be submitted for each diameter, length, material designation, grade, coating and manufacturer of bolt assembly."

M.06.03—Galvanizing:

Replace the entire subarticle with the following:

" **M.06.03—Galvanizing:** Unless otherwise specified on the plans or in the special provisions, the zinc coating on all iron and steel materials, other than wire, shall meet the requirements of ASTM A123, A153 or F2329, whichever shall apply.

When mechanical galvanizing is used it shall meet the requirements of ASTM B695 Class 55."

ON-THE-JOB TRAINING (OJT) WORKFORCE DEVELOPMENT PILOT

Description

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

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

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

Funding

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

Minorities and Women

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

Assigning Training Goals

The Department, through the OJT Program Coordinator, will assign training goals for a calendar year based on the contractor's past two year's activities and the contractor's anticipated upcoming year's activity with the Department. At the beginning of each year, all contractors eligible will be contacted by the Department to determine the number of trainees that will be assigned for the upcoming calendar year. At that time, the Contractor shall enter into an agreement with the Department to provide a self-imposed on-the-job training program for the calendar year. This agreement will include a specific number of annual training goals agreed to by both parties. The number of training assignments may range from one (1) to six (6) per

contractor per calendar year. Each January, a summary of the trainees required and the OJT Workforce Development Pilot package will be sent to participating contractors. The number of trainees assigned to each contractor in the summary will increase proportionately not to exceed 6, as shown in the following table. This package will also be provided to contractors as they become newly eligible for the OJT Workforce Development Pilot throughout the remainder of the year. Projects awarded after September 30 will be included in the following year's Program.

The dollar thresholds for training assignments are as follows:

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

Training Classifications

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

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

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

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

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

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

Records and Reports

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

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

Trainee Interviews

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

Trainee Wages

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

60 percent	of the journeyman wage for the first half of the training period
75 percent	of the journeyman wage for the third quarter of the training period
90 percent	of the journeyman wage for the last quarter of the training period

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

Achieving or Failing to Meet Training Goals

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

Where a contractor does not or cannot achieve its annual training goal with female or minority trainees, they must produce adequate Good Faith Efforts documentation. Good Faith Efforts are those designed to achieve equal opportunity through positive, aggressive, and continuous result-oriented measures. 23 CFR § 230.409(g) (4). Contractors should request minorities and females from unions when minorities and females are under-represented in the contractor's workforce.

Whenever a contractor requests ConnDOT approval of someone other than a minority or female, the contractor must submit documented evidence of its Good Faith Efforts to fill that position with a minority or female. When a non-minority male is accepted, a contractor must continue to attempt to meet its remaining annual training goals with females and minorities.

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

Measurement and Payment

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

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

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

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

www.ct.gov/dot

The completed form must be submitted to the Office of Contract Compliance for approval. The form is due on the 15th day of January for each trainee currently enrolled and for hours worked on ConnDOT Federal-Aid funded projects only.

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

January 2013

I. ABBREVIATIONS AND DEFINITIONS AS USED IN THIS SPECIAL PROVISION

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

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

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

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

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

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

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

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

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

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

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

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

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

II. ADMINISTRATIVE REQUIREMENTS

A. General Requirements

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

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

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

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

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

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

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

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

In addition, the report shall include:

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

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

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

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

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

B. Subcontract Requirements

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

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

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

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

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

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

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

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

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

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

C. Modification to Pre-Award Commitment

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

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

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

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

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

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

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

If the Contractor is unable to find a DBE replacement:

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

III. GOOD FAITH EFFORTS

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

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

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

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

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

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

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

IV. PROJECT COMPLETION

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

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

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

V. SHORTFALLS

A. Failure to meet DBE goals

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

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

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

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

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

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

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

B. Administrative Remedies for Non-Compliance:

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

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

VI. CLASSIFICATIONS OTHER THAN SUBCONTRACTORS

A. Material Manufacturers

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

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

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

B. Material Suppliers (Dealers)

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

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

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

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

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

C. Brokering

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

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

D. Non-Manufacturing or Non-Supplier DBE Credit

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

- Reasonable fees or commissions charged for providing a bona fide service such as professional, technical, consultant or managerial services and assistance in the procurement of essential personnel, facilities, equipment materials or supplies necessary for the performance of the Contract, provided that the fee or commission is determined by the OOC to be reasonable and consistent with fees customarily allowed for similar services.
- The fees charged only for delivery of materials and supplies required on a job site when the hauler, trucker, or delivery service is a DBE, and not the manufacturer, or regular dealer of the materials and supplies, and provided that the fees are determined by the OOC to be reasonable and not excessive as compared with fees customarily allowed for similar services.
- The fees or commissions charged for providing bonds or insurance specifically required for the performance of the Contract, provided that the fees or commissions are determined by CTDOT to be reasonable and not excessive as compared with fees customarily allowed for similar services.

E. Trucking

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

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

VII. Suspected DBE Fraud

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

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

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

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

State Contract No.

Federal Aid Project No.

Description of Project

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

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

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

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

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

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

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

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

(Name of Corporation or Firm)

(Signature & Title of Official making the Affidavit)

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

Notary Public (Commissioner of the Superior Court)

My Commission Expires _____

CERTIFICATE OF CORPORATION

I, _____, certify that I am the _____
(Official) (President)

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

(Signature of Person Certifying)

(Date)

ITEM #0020762A - SEDIMENT HANDLING

Description:

Work under this Item is intended to provide specific procedural requirements to be followed by the Contractor during the excavation of sediments from within the Sediment Low-Level Area of Environmental Concern (SED-LLAOEC), and as shown on the Project Plans. This supplements Specifications Section 2.02, 2.03, 2.05, and 2.06 and Contract Special Provisions for excavation wherever contaminated materials are encountered. Work under this Item shall include; removal of free-draining liquids, transporting and stockpiling materials at the temporary Waste Stockpile Area (WSA); and covering, securing, and maintaining the stockpiled materials throughout the duration of the Project. All vehicles shall also have secure, watertight containers free of defects for material transportation from the project site to the WSA under this item.

Sediments consisting of non-hazardous levels of regulated substances have been documented to exist within the Housatonic River, and as shown on the Project Plans. Such contamination is documented in the reports listed in the “Notice to Contractor – Environmental Investigations”. Where contaminated sediment within the SED-LLAOEC is excavated, special handling, disposal, and documentation procedures will be required.

All sediment within the project limits has been designated as a SED-LLAOEC that cannot be reused within the project limits. Materials excavated from within the SED-LLAOEC must be directly transported to and stockpiled in the WSA, sampled by the Engineer, and transported off-site for disposal. Free-draining liquids shall be removed prior to placement within vehicles that have that have secure, watertight containers.

Materials:

The required materials are detailed on the Project plans. All materials shall conform to the requirements of the Contract.

Plastic Sheet: Polyethylene plastic sheeting for covering excavated material shall be a thickness of at least ten (10) mil and at least ten (10) feet wide.

Covers for roll-off/storage containers shall be made of polyethylene plastic, or similar water-tight material, that is of sufficient size to completely cover top opening and can be securely fastened to the container.

Sand bags used to secure polyethylene sheeting soil covers shall have a minimum weight of thirty (30) pounds.

Hay bales shall conform to the requirements of Section 2.18.02 of the Specifications.

Sorbent Boom: Shall be eight (8) inches in diameter and ten (10) feet long and possess petrophilic and hydrophilic properties. Sorbent booms shall also have devices (i.e. clips, clasps, etc.) for connection to additional lengths of boom.

Construction Methods:

A. General

Health and safety provisions shall conform to the appropriate sections of the Contract when managing material generated within the SED-LLAOEC. Provisions may include implementation of engineering controls, air and personal monitoring, the use of chemical protective clothing (CPC), personal protective equipment (PPE), and decontamination procedures.

Sediments generated from the SED-LLAOEC cannot be reused within the Project limits and shall be removed of free-draining liquids, directly transported from their point of origin to the Project WSA, using only vehicles that have that have secure, watertight containers and placed within a designated storage bin for disposal characterization sampling by the Engineer.

The stockpiles of excavated sediment shall be maintained as shown on the Project plans. The Contractor shall plan excavation activities within the SED-LLAOEC in consideration of the capacity of WSA and the material testing and disposal requirements of the applicable Contract item. **No claims for delay shall be considered based on the Contractor's failure to coordinate excavation activities as specified herein.**

The Engineer will sample the sediments stockpiled within a WSA bin at a frequency and for the constituents to meet the acceptance criteria of the treatment/recycling/disposal facilities submitted by the Contractor. The Contractor is hereby notified that laboratory turnaround time is expected to be fifteen (15) working days. Turnaround time is the period of time beginning when the Contractor notifies the Engineer which facility it intends to use and that the stockpile is ready for sampling and ending with the Contractor's receipt of the laboratory analytical results. Any change of intended treatment/recycling/disposal facility may prompt the need to resample and will therefore restart the time required for laboratory turnaround. The laboratory will furnish such results to the Engineer. Upon receipt, the Engineer will make available to the Contractor the results of the final waste characterization determinations. **No delay claim will be considered based upon the Contractor's failure to accommodate the laboratory turnaround time as identified above.**

B. Transportation and Stockpiling

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

- Sediment shall be removed of free-draining liquids prior to placement in transportation

vehicles. Sediments shall be covered prior to leaving the site, and are to remain covered until the arrival at the WSA;

- All vehicles departing the site are properly logged to show the vehicle identification, driver's name, time of departure, destination, and approximate volume and content of materials carried;
- All vehicles shall have secure, watertight containers free of defects for material transportation;
- No sediment shall leave the site until there is adequate space prepared in the WSA; and,
- Documentation must be maintained indicating that all applicable laws have been satisfied and that the materials have been successfully transported and received at the WSA.

Sediments must be sufficiently stabilized prior and transport vehicles be sufficiently watertight such that the load is USDOT-shippable in accordance with Federal regulations and no liquids escape the transport vehicle.

Construction of the WSA shall be completed prior to initiation of construction activities generating sediments from within the SED-LLAOEC. Plastic polyethylene sheeting and bedding sand or existing/new pavement shall underlay all excavated sediments as shown on Contract Plans. Measures shall be implemented to divert rainfall away from the WSA.

Placement of sorbent boom along the perimeter of the WSA shall be conducted when sediment is saturated with petroleum product.

Excavated sediments shall be staged as shown on the Project plans or as directed by the Engineer.

C. WSA Maintenance

The Contractor shall provide all necessary materials, equipment, tools, and labor for anticipated activities within the WSA. Such activities include, but are not limited to, handling and management of stockpiles and drummed CPC/PPE; uncovering and recovering stockpiles; maintenance of the WSA; replacement of damaged components (i.e. sand bags, plastic polyethylene sheeting, etc.); and waste inventory record management. The Contractor shall manage all materials in the WSA in such a way as to minimize tracking of potential contaminated materials across the site and off-site and minimize dust generation.

Each stockpile shall be securely covered when not in active use with a cover of sufficient size to prevent generation of dust, infiltration of precipitation and wind erosion.

The staged stockpiles shall be inspected at least daily by the Contractor to ensure that the cover and containment have not been damaged and that there is no apparent leakage from the piles. If the cover has been damaged, or there is evidence of leakage from the piles, the Contractor shall

immediately replace the cover or containment as needed to prevent the release of materials to the environment from the piles.

An inventory of stockpiled materials and drummed CPC/PPE shall be conducted on a daily basis. Inventory records shall indicate the approximate volume of material/drums stockpiled per day; the approximate volume of material/drums stockpiled to date; material/drums loaded and transported off-site for disposal; any materials loaded and transported for on-site reuse; and identification of stockpiles relative to their points of generation.

Following the removal of all sediment, residuals shall be removed from all surfaces of the WSA as directed by the Engineer. This operation shall be accomplished using dry methods such as shovels, brooms, mechanical sweepers, or a combination thereof. Residuals shall be disposed of as sediments.

D. Decontamination

All equipment shall be provided to the work site free of contamination. The Engineer may prohibit from the site any equipment that in his opinion has not been thoroughly decontaminated prior to arrival. Any decontamination of the Contractor's equipment prior to arrival at the site shall be at the expense of the Contractor. The Contractor is prohibited from decontaminating equipment on the Project that has not been thoroughly decontaminated prior to arrival.

The Contractor shall furnish labor, materials, tools, and equipment for decontamination of all equipment and supplies that are used to handle sediment. Decontamination shall be conducted at an area designated by the Engineer and may be required prior to equipment and supplies leaving the Project or between stages of the work in the SED- LLAOEC.

Dry decontamination procedures shall be used unless the Engineer determines that such methods are not sufficient. Dry decontamination consists of mechanical methods to remove residual soil to prevent it from being carried to other areas. This includes the use of hand tools, brushes, brooms and similar equipment. Residuals from dry decontamination activities shall be collected and managed as sediment. If dry methods are unsatisfactory as determined by the Engineer, the Contractor shall modify decontamination procedures as required subject to the Engineer's approval.

E. Dust Control

The Contractor shall implement a fugitive dust suppression program in accordance with the Contract to prevent the off-site migration of particulate matter and/or dust resulting from excavation, loading, and operations associated with sediments. It shall be the Contractor's responsibility to supervise fugitive dust control measures and to monitor airborne particulate matter. The Contractor shall:

1. Employ reasonable fugitive dust suppression techniques.
2. Visually observe the amounts of particulate and/or fugitive dust generated during

the handling of sediment. If the apparent amount of fugitive dust and/or particulate matter is not acceptable to the Engineer, the Engineer may direct the Contractor to implement corrective measures at his discretion, including, but not limited to, the following:

- (a) apply water to pavement surfaces
- (b) apply water to equipment and excavation faces; and
- (c) apply water during excavation, loading, and dumping.

G. Permit Compliance

The Contractor shall comply with the terms and conditions of the Connecticut Department of Energy and Environmental Protection (CTDEEP) “General Permit for Contaminated Soil and/or Sediment Management (Staging and Transfer)”, including the General Operating Conditions and the Specific Operating Conditions, except that the Engineer will conduct all soil/sediment characterization and perform all record keeping. In particular, the Contractor shall:

1. Operate, maintain, and repair the WSA in conformance with the requirements of the General Permit.
2. Maintain a communications system capable of summoning fire, police, and/or other emergency service personnel.
3. Maintain fences, gates, or other barriers (natural or artificial) to prevent unauthorized entry onto the stockpiles.
4. Separate incidental excavation waste to the satisfaction of the receiving facility or to an extent that renders the contaminated soil and/or sediment suitable for its intended reuse.
5. Isolate and temporarily store incidental waste in a safe manner prior to off-site transport to a facility lawfully authorized to accept such waste.
6. Do not store more than 100 cubic yards of incidental waste at any one time.
7. Sort, separate, and isolate all hazardous waste from contaminated soil and/or sediment.
8. Prevent or minimize the transfer or infiltration of contaminants from the stockpiles to the ground as detailed in “B. Transportation and Stockpiling” above.
9. Securely cover each stockpile of soil and/or sediment as detailed in “C. WSA Maintenance” above.
10. Minimize wind erosion and dust transport as detailed in “E. Dust Control” above.
11. Maintain anti-tracking measures at the WSA to minimize the vehicle tracking of sediment from the WSA onto the public roadway.
12. Instruct the transporters of contaminated sediment of best management practices for the transportation of such sediment (properly covered loads, removing loose material from dump body, etc.).
13. Control all traffic related to the operation of the facility in such a way as to mitigate the queuing of vehicles off-site and excessive or unsafe traffic impact in the area where the facility is located.
14. Ensure that, except as allowed in section 22a-174-18(b)(3)(C) of the Regulations of Connecticut State Agencies, trucks are not left idling for more than three (3) consecutive minutes.

Method of Measurement:

The work of Sediment Handling will be measured for payment by the number of cubic yards of sediment excavated within the SED-LLAOEC, transported to the WSA, and stockpiled within the storage bins for sampling by the Engineer. This measurement shall be in accordance with and in addition to the quantity measured for payment of the applicable excavation item in Specification Sections 2.02, 2.03, 2.05, 2.06, or the Contract Special Provisions, as applicable. Excess excavations made by the Contractor beyond the payment limits specified in the Contract will not be measured for payment and the Contractor assumes all costs associated with the appropriate handling, management, and disposal of this material.

Equipment decontamination, the collection of residuals, and the collection and disposal of liquids generated during equipment decontamination activities will not be measured separately for payment.

Basis of Payment:

This work shall be paid for at the Contract unit price, which shall include removal of free-draining liquids, all transportation from the excavation site to the WSA for placement in a storage bin; covering, securing, and maintaining the individual stockpiles within the WSA throughout the duration of the Project; and all tools, equipment, material, and labor incidental to this work.

This price shall also include equipment decontamination, the collection of residuals generated during decontamination and placement of such material in the WSA, and the collection and disposal of liquids generated during equipment decontamination activities.

All materials, labor, and equipment associated with compliance with the General Permit for Contaminated Soil and/or Sediment Management (Staging and Transfer) will not be measured separately but will be considered incidental to the item "Sediment Handling".

Payment for dust control activities shall be made under the appropriate Contract items.

<u>Pay Item</u>	<u>Pay Unit</u>
Sediment Handling	C.Y.

ITEM #0020762A - SEDIMENT HANDLING

Description:

Work under this Item is intended to provide specific procedural requirements to be followed by the Contractor during the excavation of sediments from within the Sediment Low-Level Area of Environmental Concern (SED-LLAOEC), and as shown on the Project Plans. This supplements Specifications Section 2.02, 2.03, 2.05, and 2.06 and Contract Special Provisions for excavation wherever contaminated materials are encountered. Work under this Item shall include; removal of free-draining liquids, transporting and stockpiling materials at the temporary Waste Stockpile Area (WSA); and covering, securing, and maintaining the stockpiled materials throughout the duration of the Project. All vehicles shall also have secure, watertight containers free of defects for material transportation from the project site to the WSA under this item.

Sediments consisting of non-hazardous levels of regulated substances have been documented to exist within the Housatonic River, and as shown on the Project Plans. Such contamination is documented in the reports listed in the “Notice to Contractor – Environmental Investigations”. Where contaminated sediment within the SED-LLAOEC is excavated, special handling, disposal, and documentation procedures will be required.

All sediment within the project limits has been designated as a SED-LLAOEC that cannot be reused within the project limits. Materials excavated from within the SED-LLAOEC must be directly transported to and stockpiled in the WSA, sampled by the Engineer, and transported off-site for disposal. Free-draining liquids shall be removed prior to placement within vehicles that have that have secure, watertight containers.

Materials:

The required materials are detailed on the Project plans. All materials shall conform to the requirements of the Contract.

Plastic Sheet: Polyethylene plastic sheeting for covering excavated material shall be a thickness of at least ten (10) mil and at least ten (10) feet wide.

Covers for roll-off/storage containers shall be made of polyethylene plastic, or similar water-tight material, that is of sufficient size to completely cover top opening and can be securely fastened to the container.

Sand bags used to secure polyethylene sheeting soil covers shall have a minimum weight of thirty (30) pounds.

Hay bales shall conform to the requirements of Section 2.18.02 of the Specifications.

Sorbent Boom: Shall be eight (8) inches in diameter and ten (10) feet long and possess petrophilic and hydrophilic properties. Sorbent booms shall also have devices (i.e. clips, clasps, etc.) for connection to additional lengths of boom.

Construction Methods:

A. General

Health and safety provisions shall conform to the appropriate sections of the Contract when managing material generated within the SED-LLAOEC. Provisions may include implementation of engineering controls, air and personal monitoring, the use of chemical protective clothing (CPC), personal protective equipment (PPE), and decontamination procedures.

Sediments generated from the SED-LLAOEC cannot be reused within the Project limits and shall be removed of free-draining liquids, directly transported from their point of origin to the Project WSA, using only vehicles that have that have secure, watertight containers and placed within a designated storage bin for disposal characterization sampling by the Engineer.

The stockpiles of excavated sediment shall be maintained as shown on the Project plans. The Contractor shall plan excavation activities within the SED-LLAOEC in consideration of the capacity of WSA and the material testing and disposal requirements of the applicable Contract item. **No claims for delay shall be considered based on the Contractor's failure to coordinate excavation activities as specified herein.**

The Engineer will sample the sediments stockpiled within a WSA bin at a frequency and for the constituents to meet the acceptance criteria of the treatment/recycling/disposal facilities submitted by the Contractor. The Contractor is hereby notified that laboratory turnaround time is expected to be fifteen (15) working days. Turnaround time is the period of time beginning when the Contractor notifies the Engineer which facility it intends to use and that the stockpile is ready for sampling and ending with the Contractor's receipt of the laboratory analytical results. Any change of intended treatment/recycling/disposal facility may prompt the need to resample and will therefore restart the time required for laboratory turnaround. The laboratory will furnish such results to the Engineer. Upon receipt, the Engineer will make available to the Contractor the results of the final waste characterization determinations. **No delay claim will be considered based upon the Contractor's failure to accommodate the laboratory turnaround time as identified above.**

B. Transportation and Stockpiling

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

- Sediment shall be removed of free-draining liquids prior to placement in transportation

vehicles. Sediments shall be covered prior to leaving the site, and are to remain covered until the arrival at the WSA;

- All vehicles departing the site are properly logged to show the vehicle identification, driver's name, time of departure, destination, and approximate volume and content of materials carried;
- All vehicles shall have secure, watertight containers free of defects for material transportation;
- No sediment shall leave the site until there is adequate space prepared in the WSA; and,
- Documentation must be maintained indicating that all applicable laws have been satisfied and that the materials have been successfully transported and received at the WSA.

Sediments must be sufficiently stabilized prior and transport vehicles be sufficiently watertight such that the load is USDOT-shippable in accordance with Federal regulations and no liquids escape the transport vehicle.

Construction of the WSA shall be completed prior to initiation of construction activities generating sediments from within the SED-LLAOEC. Plastic polyethylene sheeting and bedding sand or existing/new pavement shall underlay all excavated sediments as shown on Contract Plans. Measures shall be implemented to divert rainfall away from the WSA.

Placement of sorbent boom along the perimeter of the WSA shall be conducted when sediment is saturated with petroleum product.

Excavated sediments shall be staged as shown on the Project plans or as directed by the Engineer.

C. WSA Maintenance

The Contractor shall provide all necessary materials, equipment, tools, and labor for anticipated activities within the WSA. Such activities include, but are not limited to, handling and management of stockpiles and drummed CPC/PPE; uncovering and recovering stockpiles; maintenance of the WSA; replacement of damaged components (i.e. sand bags, plastic polyethylene sheeting, etc.); and waste inventory record management. The Contractor shall manage all materials in the WSA in such a way as to minimize tracking of potential contaminated materials across the site and off-site and minimize dust generation.

Each stockpile shall be securely covered when not in active use with a cover of sufficient size to prevent generation of dust, infiltration of precipitation and wind erosion.

The staged stockpiles shall be inspected at least daily by the Contractor to ensure that the cover and containment have not been damaged and that there is no apparent leakage from the piles. If the cover has been damaged, or there is evidence of leakage from the piles, the Contractor shall

immediately replace the cover or containment as needed to prevent the release of materials to the environment from the piles.

An inventory of stockpiled materials and drummed CPC/PPE shall be conducted on a daily basis. Inventory records shall indicate the approximate volume of material/drums stockpiled per day; the approximate volume of material/drums stockpiled to date; material/drums loaded and transported off-site for disposal; any materials loaded and transported for on-site reuse; and identification of stockpiles relative to their points of generation.

Following the removal of all sediment, residuals shall be removed from all surfaces of the WSA as directed by the Engineer. This operation shall be accomplished using dry methods such as shovels, brooms, mechanical sweepers, or a combination thereof. Residuals shall be disposed of as sediments.

D. Decontamination

All equipment shall be provided to the work site free of contamination. The Engineer may prohibit from the site any equipment that in his opinion has not been thoroughly decontaminated prior to arrival. Any decontamination of the Contractor's equipment prior to arrival at the site shall be at the expense of the Contractor. The Contractor is prohibited from decontaminating equipment on the Project that has not been thoroughly decontaminated prior to arrival.

The Contractor shall furnish labor, materials, tools, and equipment for decontamination of all equipment and supplies that are used to handle sediment. Decontamination shall be conducted at an area designated by the Engineer and may be required prior to equipment and supplies leaving the Project or between stages of the work in the SED- LLAOEC.

Dry decontamination procedures shall be used unless the Engineer determines that such methods are not sufficient. Dry decontamination consists of mechanical methods to remove residual soil to prevent it from being carried to other areas. This includes the use of hand tools, brushes, brooms and similar equipment. Residuals from dry decontamination activities shall be collected and managed as sediment. If dry methods are unsatisfactory as determined by the Engineer, the Contractor shall modify decontamination procedures as required subject to the Engineer's approval.

E. Dust Control

The Contractor shall implement a fugitive dust suppression program in accordance with the Contract to prevent the off-site migration of particulate matter and/or dust resulting from excavation, loading, and operations associated with sediments. It shall be the Contractor's responsibility to supervise fugitive dust control measures and to monitor airborne particulate matter. The Contractor shall:

1. Employ reasonable fugitive dust suppression techniques.
1. Visually observe the amounts of particulate and/or fugitive dust generated during

the handling of sediment. If the apparent amount of fugitive dust and/or particulate matter is not acceptable to the Engineer, the Engineer may direct the Contractor to implement corrective measures at his discretion, including, but not limited to, the following:

- (a) apply water to pavement surfaces
- (b) apply water to equipment and excavation faces; and
- (c) apply water during excavation, loading, and dumping.

G. Permit Compliance

The Contractor shall comply with the terms and conditions of the Connecticut Department of Energy and Environmental Protection (CTDEEP) “General Permit for Contaminated Soil and/or Sediment Management (Staging and Transfer)”, including the General Operating Conditions and the Specific Operating Conditions, except that the Engineer will conduct all soil/sediment characterization and perform all record keeping. In particular, the Contractor shall:

1. Operate, maintain, and repair the WSA in conformance with the requirements of the General Permit.
2. Maintain a communications system capable of summoning fire, police, and/or other emergency service personnel.
3. Maintain fences, gates, or other barriers (natural or artificial) to prevent unauthorized entry onto the stockpiles.
4. Separate incidental excavation waste to the satisfaction of the receiving facility or to an extent that renders the contaminated soil and/or sediment suitable for its intended reuse.
5. Isolate and temporarily store incidental waste in a safe manner prior to off-site transport to a facility lawfully authorized to accept such waste.
6. Do not store more than 100 cubic yards of incidental waste at any one time.
7. Sort, separate, and isolate all hazardous waste from contaminated soil and/or sediment.
8. Prevent or minimize the transfer or infiltration of contaminants from the stockpiles to the ground as detailed in “B. Transportation and Stockpiling” above.
9. Securely cover each stockpile of soil and/or sediment as detailed in “C. WSA Maintenance” above.
10. Minimize wind erosion and dust transport as detailed in “E. Dust Control” above.
11. Maintain anti-tracking measures at the WSA to minimize the vehicle tracking of sediment from the WSA onto the public roadway.
12. Instruct the transporters of contaminated sediment of best management practices for the transportation of such sediment (properly covered loads, removing loose material from dump body, etc.).
13. Control all traffic related to the operation of the facility in such a way as to mitigate the queuing of vehicles off-site and excessive or unsafe traffic impact in the area where the facility is located.
14. Ensure that, except as allowed in section 22a-174-18(b)(3)(C) of the Regulations of Connecticut State Agencies, trucks are not left idling for more than three (3) consecutive minutes.

Method of Measurement:

The work of Sediment Handling will be measured for payment by the number of cubic yards of sediment excavated within the SED-LLAOEC, transported to the WSA, and stockpiled within the storage bins for sampling by the Engineer. This measurement shall be in accordance with and in addition to the quantity measured for payment of the applicable excavation item in Specification Sections 2.02, 2.03, 2.05, 2.06, or the Contract Special Provisions, as applicable. Excess excavations made by the Contractor beyond the payment limits specified in the Contract will not be measured for payment and the Contractor assumes all costs associated with the appropriate handling, management, and disposal of this material.

Equipment decontamination, the collection of residuals, and the collection and disposal of liquids generated during equipment decontamination activities will not be measured separately for payment.

Basis of Payment:

This work shall be paid for at the Contract unit price, which shall include removal of free-draining liquids, all transportation from the excavation site to the WSA for placement in a storage bin; covering, securing, and maintaining the individual stockpiles within the WSA throughout the duration of the Project; and all tools, equipment, material, and labor incidental to this work.

This price shall also include equipment decontamination, the collection of residuals generated during decontamination and placement of such material in the WSA, and the collection and disposal of liquids generated during equipment decontamination activities.

All materials, labor, and equipment associated with compliance with the General Permit for Contaminated Soil and/or Sediment Management (Staging and Transfer) will not be measured separately but will be considered incidental to the item "Sediment Handling".

Payment for dust control activities shall be made under the appropriate Contract items.

<u>Pay Item</u>	<u>Pay Unit</u>
Sediment Handling	C.Y.

ITEM #0020763A - DISPOSAL OF SEDIMENTS**Description:**

Work under this item shall consist of the loading, transportation and final off-site disposal of sediments from within the project SED-LLAOEC. These sediments are contaminated at non-hazardous levels as documented in the reports listed in the “Notice to Contractor – Environmental Investigations”. The results contained in the environmental investigation reports listed in the “Notice to Contractor – Environmental Investigations” show levels of various contaminants that the Contractor may encounter during construction. Actual levels found during construction may vary and such variations will not be considered a change in condition provided the material can still be disposed as non-hazardous at one or more of the disposal facilities listed herein. The sediments are designated for off-site disposal at an upland facility and, after characterization by the Engineer, shall be taken from the WSA, transported, and disposed of at a DOT-approved upland disposal facility listed herein.

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

Allied Waste Niagara Falls Landfill, LLC 5600 Niagara Falls Blvd. Niagara, NY 14304 716-285-3344; David Hanson	Clean Earth of Carteret 24 Middlesex Avenue Carteret, NJ 07008 732-541-8909; Cheryl Coffee
Clean Earth of Philadelphia, Inc. 3201 S 61 Street Philadelphia, PA 215-724-5520; Mike Kelly	Clean Earth of North Jersey, Inc. 115 Jacobus Avenue, South Kearny, NJ 07105 973-344-4004
Clean Earth of Southeast Pennsylvania, Inc. 7 Steel Road Morrisville, PA 19067 215-428-1700; Joe Siravo	Cranston Sanitary Landfill 1690 Pontiac Avenue Cranston, RI 02920 413-552-3688; Paul Mahoney
Cumberland County Landfill 135 Vaughn Road Shippensburg, PA 17257 713-423-9953	ESMI of New York, LLC 304 Towpath Road Fort Edward, NY 12828 518-747-5500; Peter Hansen
ESMI of New Hampshire 67 International Drive Loudon, NH 03307 603-783-0228; Stephen Raper	Manchester Landfill 311 Olcott Street Manchester, CT 06040 860-647-3248; Brooks Parker

Clean Earth of Connecticut (formerly Phoenix Soil, LLC) 58 North Washington Street Plainville, CT 06062 860-747-8888; Sue Brenner	Ontario County Landfill (Managed by Casella Waste) 3555 Post Farm Road Stanley, NY 14561 603-235-3597; Scott Sampson
The Southbridge Recycling and Disposal Park 165 Barefoot Road Southbridge, MA 01550 603-235-3597	Hazelton Creek Properties, LLC* 280 South Church Street Hazelton, PA 18201 570-574-1010; Allen Swantek
Upton Landfill Maple Avenue Upton, MA 413-522-3688	Waste Management of NH 90 Rochester Neck Road Rochester, NH 03839 603-330-2197
Waste Management – RCI Fitchburg Landfill Fitchburg Princeton Road Westminster, MA 01473 978-355-6821; Frank Sepiol	Clinton Landfill 242 Church Street Clinton, MA 01510 978-365-4110; Chris McGown
Dudley Reclamation Project 123 Oxford Avenue Dudley, MA 978-663-2623	Red Technologies Soil 232 Airline Avenue Portland, CT 06980 860-342-1022; Christopher Windangle

* - Please note that if this facility is to be used, each bin letter will require an additional 10 day (or more) waiting period in addition to the 15 day lab period designated in the Specifications to allow for Pennsylvania Department of Environmental Protection (PADEP) review.

The above list contains treatment/recycle/disposal facilities which can accept the waste stream generated by the project in quantities that may be limited by their permits and their operations restrictions. It is the responsibility of the contractor to verify that a facility will be available and capable of handling the volume as well as the chemical and physical characteristics of material generated by the project.

Construction Methods:

A. Material Disposal

After the sediment has been adequately dewatered and any necessary solidification material has been added, the Engineer will sample materials stored in the bins at the Waste Stockpile Area at a frequency established by the selected treatment/recycling/disposal facilities. The Contractor shall designate to the Engineer which facility he intends to use prior to samples being taken. The Contractor is hereby notified that laboratory turnaround time is expected to be fifteen (15) working days. Turnaround time is the period of time beginning when the Contractor notifies the Engineer that the bins are full and ready for sampling and ending with the Contractor's receipt of the laboratory analytical results. Any change of intended treatment/recycling/disposal facility

may prompt the need to resample and will therefore restart the time required for laboratory turnaround. The laboratory will furnish such results to the Engineer. Upon receipt, the Engineer will make available to the Contractor the results of the final waste characterization determinations. **No delay claim will be considered based upon the Contractor's failure to accommodate the laboratory turnaround time as identified above.**

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

Any material processing (including but not limited to the removal of woody debris, scrap metal, pressure-treated and untreated wood timber, large stone, concrete, polyethylene sheeting or similar material) required by the Contractor's selected facility will be completed by the Contractor prior to the material leaving the site. It is solely the Contractor's responsibility to meet any such requirements of its facility. Any materials removed shall be disposed of or recycled in a manner acceptable to the Engineer at no additional cost.

All manifests or bills of lading utilized to accompany the transportation of the material shall be prepared by the Contractor and signed by an authorized Department representative, as Generator, for each truck load of material that leaves the site. The Contractor shall forward the appropriate original copies of all manifests or bills of lading to the Engineer the same day the material leaves the Project.

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

B. Material Transportation

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

- Transported sediments are to be covered sufficiently to preclude the loss of material during transport prior to leaving the site and are to remain covered until the arrival at the selected treatment/recycling/disposal facility.
- All vehicles departing the site are to be properly logged to show the vehicle identification, driver's name, time of departure, destination, and approximate volume, and contents of materials carried.

- No sediments shall leave the site unless a treatment/recycling/disposal facility willing to accept all of the material being transported has agreed to accept the type and quantity of waste.
- Discharge openings on trucks used for the transportation of sediments must be securely closed during transportation. Trucks deemed unacceptable for use by the Engineer will not be used for the transportation of sediments.

C. Equipment Decontamination

All equipment shall be provided to the work site free of gross contamination. The Engineer may prohibit from the site any equipment that in his opinion has not been thoroughly decontaminated prior to arrival. Any decontamination of the Contractor's equipment prior to arrival at the site shall be at the expense of the Contractor. The Contractor is prohibited from decontaminating equipment on the Project site that has not been thoroughly decontaminated prior to arrival.

The Contractor shall furnish labor, materials, tools and equipment for decontamination of all equipment and supplies that are used to handle the sediments. Decontamination shall be conducted at an area designated by the Engineer and shall be required prior to equipment and supplies leaving the Project, and between stages of the work.

The Contractor shall use dry decontamination procedures. Residuals from dry decontamination activities shall be collected and managed as sediments. If the results from dry methods are unsatisfactory to the Engineer, the Contractor shall modify decontamination procedures as required.

The Contractor shall be responsible for the collection and treatment/recycling/disposal of any liquid wastes that may be generated by its decontamination activities in accordance with applicable regulations.

Method of Measurement:

The work of "DISPOSAL OF SEDIMENTS" will be measured for payment as the actual net weight in tons of material delivered to the treatment/recycling/disposal facility. Such determinations shall be made by measuring each hauling vehicle on the certified permanent scales at the treatment/recycling/disposal facility. Total weight will be the summation of weight bills issued by the facility specific to this Project. Excess excavations made by the Contractor beyond the payment limits specified in Specifications Sections 2.02, 2.03, 2.05, and 2.06 or the Contract Special Provisions (as appropriate) will not be measured for payment and the Contractor assumes responsibility for all costs associated with the appropriate handling, management and disposal of this material.

The disposal of excavated materials, originally anticipated to be controlled materials, but determined by characterization sampling not to contain concentrations of regulated chemicals (non-polluted or “clean” materials) will not be measured for payment under this item but will be considered as surplus excavated materials and will be paid in accordance with Article 1.04.05.

Equipment decontamination, the collection of residuals, and the collection and disposal of liquids generated during equipment decontamination activities will not be measured separately for payment.

Basis of Payment:

This work will be paid for at the Contract unit price, which shall include the loading and transportation of sediments from the WSA to the treatment/recycling/disposal facility; the preparation of manifests and fees paid; and all equipment, materials, tools, and labor incidental to loading, transporting, and treating/recycling/disposal of materials. **This unit price will be applicable to all of the listed disposal facilities and will not change for the duration of the Project. Nothing herein shall prevent changes as outlined in Article 1.04.02.**

This price shall also include equipment decontamination; the collection of residuals generated during decontamination and placement of such material in the WSA; and the collection and disposal of liquids generated during equipment decontamination activities.

Solidification of sediments will be paid under Item No. 0101130A – Environmental Work - Solidification.

<u>Pay Item</u>	<u>Pay Unit</u>
Disposal of Sediments	Ton

ITEM #0020801A – ASBESTOS ABATEMENT

Description:

Work under this item shall include the abatement of asbestos containing materials (ACM) and associated work by persons who are knowledgeable, qualified, trained and licensed in the removal, treatment, handling, and disposal of ACM and the subsequent cleaning of the affected environment. ACM shall include material composed of any type of asbestos in amounts greater than one percent (1%) by weight. The Contractor performing this work shall possess a valid Asbestos Abatement Contractor license issued by the Connecticut Department of Public Health (CTDPH).

These Specifications govern all work activities that disturb asbestos containing materials. All activities shall be performed in accordance with, but not limited to, the current revision of the OSHA General Industry Standard for Asbestos (29 CFR 1926.1001), the OSHA Asbestos in Construction Regulations (29 CFR 1926.1101), the USEPA Asbestos National Emission Standards for Hazardous Air Pollutants (NESHAP) Regulations (40 CFR Part 61 Subpart M), the CTDPH Standards for Asbestos Abatement, Licensure and Training (19a-332a-1 through 16, 20-440-1 through 9 & 20-441), and the CTDEEP Special Waste Disposal Regulations (22a-209-8(i)).

The asbestos abatement work shall include the removal and disposal of all ACM as identified on the Contract Plans and Specifications prior to the planned renovation/demolition project. This Item 0020801A – Asbestos Abatement was designed by Mr. Stephen Arienti, a State of Connecticut licensed Asbestos Project Designer (#000284).

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

Materials:

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

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

Fire retardant polyethylene sheet shall be in roll size to minimize the frequency of joints, with factory label indicating four (4) or six (6) mil thickness.

Six (6) mil polyethylene disposable bags shall have pre-printed OSHA/EPA/DOT labels and shall be transparent.

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

Surfactant is a chemical wetting agent added to water to improve penetration and shall consist of fifty (50) percent polyoxyethylene ether and fifty (50) percent polyoxyethylene ester, or equivalent. The surfactant shall be mixed with water to provide a concentration one (1) ounce surfactant to five (5) gallons of water, or as directed by the manufacturer.

Spray equipment must be capable of mixing necessary chemical agents with water, generating sufficient pressure and volume; and equipped with adequate hose length to access all necessary work areas.

Drills, saws, sanders, grinders, wire brushes and needle-gun type removal equipment shall be equipped with a High Efficiency Particulate Air (HEPA) filtered vacuum dust collection system.

Containers for storage, transportation and disposal of asbestos containing waste material shall be impermeable and both air and watertight.

Labels and warning signs shall conform to OSHA 29 CFR 1926.1101, USEPA 40 CFR Part 61.152, and USDOT 49 CFR Part 172 as appropriate.

Encapsulant, a material used to chemically entrap asbestos fibers to prevent these fibers from becoming airborne, shall be of the type which has been approved by the Engineer. Use shall be in accordance with manufacturer's printed technical data. The encapsulant shall be clear and must be compatible with new materials being installed, if any.

Any planking, bracing, shoring, barricades and/or temporary sheet piling, necessary to appropriately perform work activities shall conform to all applicable federal, state and local regulations.

Air filtration devices and vacuum units shall be equipped with HEPA filters.

Construction Methods:

(1) Pre-Abatement Submittals and Notices

- (a) The scope of work for this project includes the removal of exterior non-friable ACM, which is not defined as "Asbestos Abatement" under the CTDPH Asbestos Abatement Standards (19a-332a-1) nor as Regulated asbestos containing materials (RACM) under the EPA Asbestos NESHAP. Therefore, the Contractor is **not required to submit an Asbestos Abatement Notification to CTDPH or EPA, prior to the commencement of work, so long as work practices will not render more than 25 square feet (SF) (CTDPH) or 160 SF (EPA) of the exterior non-friable ACM into a friable state.**

- (b) Fifteen (15) working days prior to the commencement of asbestos abatement work, the Contractor shall submit to the Engineer for review and acceptance and/or acknowledgment of the following:
1. Permits and licenses for the removal of asbestos-containing or contaminated materials, including a CTDPH valid asbestos removal contractor's license.
 2. Documentation dated within the previous twelve (12) months, certifying that all employees have received USEPA Model Accreditation Plan approved asbestos worker/supervisor training in the proper handling of materials that contain asbestos; understand the health implications and risks involved, including the illnesses possible from exposure to airborne asbestos fibers; understands the use and limits of respiratory equipment to be used; and understands the results of monitoring of airborne quantities of asbestos as related to health and respiratory equipment as indicated in 29 CFR 1926.1101 on an initial and annual basis, and copies of all employees CTDPH asbestos worker and/or supervisor licenses.
 3. Documentation from the Contractor, typed on company letterhead and signed by the Contractor, certifying that all employees listed therein have received the following:
 - a. medical monitoring within the previous twelve (12) months, as required in 29 CFR 1926.1101;
 - b. respirator fit testing within the previous twelve (12) months as detailed in 29 CFR 1910.134 (for all employees who must also don a tight-fitting face piece respirator).
 4. Copies of the EPA/State-approved certificates for the proposed asbestos landfill.
- (c) No abatement shall commence until a copy of all required submittals have been received and found acceptable to the Engineer. Those employees added to the Contractor's original list will be allowed to perform work only upon submittal to, and receipt of, all required paperwork by the Engineer.

(2) Asbestos Abatement Provisions:

(a) General Requirements

The Abatement Contractor/Subcontractor shall possess a valid State of Connecticut Asbestos Contractor License. Should any portion of the work be subcontracted, the subcontractor must also possess a valid State of Connecticut Asbestos Contractor License. The Asbestos Abatement Site Supervisor employed by the Contractor shall be in control on the job site at all times during asbestos abatement work. All employees of the Contractor who shall perform work (i.e. Asbestos Abatement Site Supervisor, Asbestos Abatement Worker) shall be properly certified/licensed by the State of Connecticut to perform such duties.

All labor, materials, tools, equipment, services, testing, insurance (with specific coverage for work on asbestos), and incidentals which are necessary or required to perform the work in accordance with applicable governmental regulations, industry standards and codes, and these Specifications shall be provided by the Contractor. The Contractor shall be prepared to work all shifts and weekends throughout the course of this project.

Prior to beginning work, the Engineer and Contractor shall perform a visual survey of each work area and review conditions at the site for safety reasons. In addition, the Contractor shall instruct all workers in all aspects of personnel protection, work procedures, emergency evacuation procedures and use of equipment including procedures unique to this project.

The Contractor shall, when necessary, provide temporary power and adequate lighting and ensure safe installation of electrical equipment, including ground fault protection and power cables, in compliance with applicable electrical codes and OSHA requirements. The Contractor is responsible for proper connection and installation of electrical wiring.

If sufficient electrical service is unavailable, the Contractor may need to supply electrical power to the site by fuel operated generator(s). Electrical power supply shall be sufficient for all equipment required for this project in operation throughout the duration of the project.

Water service may not be available at the site. Contractor shall supply sufficient water for each shift to operate the decontamination shower units as well as to maintain the work areas adequately wet.

Ladders and/or scaffolds shall be in compliance with OSHA requirements, and of adequate length, strength and sufficient quantity to support the scope of work. Use of ladders/scaffolds shall be in conformance with OSHA 29 CFR 1926 Subpart L and X requirements.

Work performed at heights exceeding six feet (6') shall be performed in accordance with the OSHA Fall Protection Standard 29 CFR 1926 Subpart M including the use of fall arrest systems as applicable.

Data provided regarding asbestos sampling conducted throughout the structure(s) is for informational purposes only. Under no circumstances shall this information be the sole means used by the Contractor for determining the presence, location and/or quantity of all asbestos containing materials. The Contractor shall verify all field conditions affecting performance of the work as described in these Specifications in accordance with OSHA, USEPA, USDOT, DEEP standards. Compliance with the applicable requirements is solely the responsibility of the Contractor.

The Engineer will provide a Project Monitor to oversee the activities of the Contractor. No asbestos work shall be performed until the Project Monitor is on-site. Pre-abatement, during abatement and post-abatement air sampling will be conducted as deemed necessary by the Project Monitor. Waste stream testing will be performed, as necessary, by the Project Monitor prior to waste disposal.

(b) Set-Up

Pre-clean the work areas using HEPA filtered equipment (vacuum) and/or wet methods as appropriate, collecting and properly containing all loose debris as asbestos-containing/asbestos contaminated waste. Vacuum units, of suitable size and capabilities for the project, shall have HEPA filters capable of trapping and retaining at least 99.97 percent of all monodispersed particles of three micrometers in diameter or larger. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters.

The Contractor shall establish a remote Worker Decontamination Enclosure System consisting of Equipment Room, Shower Room and Clean Room in series, as detailed below. Access to the Regulated Area shall only be through this enclosure.

Access between rooms in the Worker Decontamination Enclosure System shall be through airlocks. Other effective designs are permissible. The Clean Room, Shower Room and Equipment Room located within the Worker Decontamination Enclosure, shall be contiguously connected with taped airtight edges.

The Clean Room shall be adequately sized to accommodate workers and shall be equipped with a suitable number of hooks, lockers, shelves, etc., for workers to store personal articles and clothing. Changing areas of the Clean Room shall be suitably screened from areas occupied by the public.

The Shower Room shall be of sufficient capacity to accommodate the number of workers. One shower stall shall be provided for each eight (8) workers. Showers shall be equipped with hot and cold or warm running water through the use of electric hot water heaters supplied by the Contractor. No worker or other person shall leave a Regulated Area without showering. Shower water shall be collected and filtered using best available technology and disposed of in an approved sanitary drain. Shower stalls and plumbing shall include sufficient hose length and drain system or an acceptable alternate.

The Contractor shall ensure that no personnel or equipment be permitted to leave the Regulated Area until proper decontamination procedures (including HEPA vacuuming, wet wiping and showering) to remove all asbestos debris have occurred.

Post warning signs meeting the specifications of OSHA 29 CFR 1910.1001 and 29 CFR 1926.1101 at each Regulated Area. In addition, signs shall be posted at all approaches to Regulated Areas so that an employee may read the sign and take the necessary protective steps before entering the area. Additional signs may require posting following construction of workplace enclosure barriers.

Alternate set up requirements for exterior non-friable asbestos abatement procedures

In lieu of the establishment of a negative pressure enclosure (NPE) system as described by CTDPH Sections 19a-332a-5(c), 5(d), 5(e), and 5(h), non-friable ACM will be removed from exterior work areas within an outdoor Regulated Area(s). The regulated work area will be established by the use of appropriately labeled barrier tape and postings in compliance with CTDPH 19a-332a-5(a) as well as OSHA 29 CFR 1926.1101. A remote personnel

decontamination unit as specified in Section 19a-332a-6 will be required. This method shall only be utilized provided exposure assessment air sampling data collected during the removal of the exterior non-friable materials indicates that the exposure levels during removal of such materials do not exceed 0.1 asbestos f/cc. Should exposure assessment air sampling data exceed this level, and engineering efforts to reduce the airborne fiber levels not be successful in reducing the levels to less than 0.1 f/cc, removal shall occur within these areas under full containment conditions.

(c) Personnel Protection

The Contractor shall utilize all appropriate engineering controls and safety and protective equipment while performing the work in accordance with OSHA, USEPA, USDOT, CTDEEP and CTDPH regulations.

The Contractor shall provide and require all workers to wear protective clothing in the Regulated Areas where asbestos fiber concentrations may reasonably be expected to exceed the OSHA established Permissible Exposure Limits (PEL) or where asbestos contamination exists. Protective clothing shall include impervious coveralls with elastic wrists and ankles, head covering, gloves and foot coverings.

Respiratory protection shall be provided and shall meet the requirements of OSHA as required in 29 CFR 1910.134, and 29 CFR 1926.1101 as well as the requirements of the CTDPH regulations. A formal respiratory protection program must be implemented in accordance with 29 CFR 1926.1101 and 29 CFR 1910.134. The Contractor shall provide respirators from among those approved as being acceptable for protection by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11.

All other necessary personnel protective equipment (i.e. hardhat, work boots, safety glasses, hearing protection, etc.) required to perform the asbestos abatement work activities shall conform to all applicable federal, state and local regulations.

All other qualified and authorized persons entering into a Regulated Area (i.e. Project Monitor, Regulatory Agency Representative) shall adhere to the requirements of personnel protection as stated in this section.

(d) Asbestos Abatement Procedures

The Asbestos Abatement Site Supervisor, as the OSHA Competent Person shall be at the site at all times.

The Contractor shall not begin abatement work until authorized by the Project Monitor, following a pre-abatement visual inspection.

All workers and authorized persons shall enter and leave the Regulated Area through the Worker Decontamination Enclosure System, leaving contaminated protective clothing in the Equipment Room for reuse or disposal of as asbestos contaminated waste. No one shall eat, drink, smoke, chew gum or tobacco, or apply cosmetics while in a Regulated Area.

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

Bridge 01218, I-84 EB over Housatonic River, Newtown/Southbury

Includes the removal of:

- **Grey caulking (C1) beneath metal supports of walkway safety fencing**

A regulated area(s) shall be established at the perimeter of the work area(s), and access shall be controlled by the Contractor. A remote personnel decontamination unit shall be utilized. Removal shall be undertaken in accordance with OSHA Class II and USEPA Asbestos NESHAP requirements.

During removal, the Contractor shall spray asbestos materials with amended water using airless spray equipment capable of providing a "mist" application to reduce the release of airborne fibers. Spray equipment shall be capable of mixing wetting agent with water and capable of generating sufficient pressure and volume. Hose length shall be sufficient to reach all of the Regulated Area. Do not "flood" the area with hose type water supply equipment with the potential to create water releases and/or run-off from the regulated area.

The Contractor shall continue to spray the asbestos materials with amended water, as necessary, throughout removal activities to ensure the asbestos materials remain adequately wet. The asbestos materials shall not be allowed to dry out.

In order to minimize airborne asbestos concentrations inside the Regulated Area, the Contractor shall remove the adequately wetted asbestos in manageable sections. In addition, asbestos materials removed from any elevated level shall be carefully lowered to the floor.

The Contractor shall promptly place the adequately wet asbestos material in disposal containers (six (6) mil polyethylene bags/fiber drum/poly-lined dumpsters, etc.) as it is removed. Large components removed intact may be wrapped in two (2) layers of six (6) mil polyethylene sheeting secured with tape. As the disposal containers are filled, the Contractor shall promptly seal the containers, apply caution labels and clean the containers before transportation from the regulated area. Bags shall be securely sealed to prevent accidental opening and leakage by taping in gooseneck fashion. Small components and asbestos-containing waste with sharp-edged components (e.g. nails, screws, metal lath, tin sheeting) which could tear polyethylene bags and sheeting shall be placed in clean drums and sealed with locking ring tops. All waste containers shall be leak-tight, (typically consisting of two layers of 6 mil poly (or bags)), and shall be properly labeled and placarded with OSHA Danger labels, DOT shipping labels, markings and placards and USEPA NESHAP generators labels. Containers shall be decontaminated by wet cleaning and HEPA vacuuming prior to exiting the regulated area.

If at any time during asbestos removal, the Project Monitor should suspect contamination of areas outside the Regulated Area, the Contractor shall immediately stop all abatement work and

take steps to decontaminate these areas and eliminate causes of such contamination. Unprotected individuals shall be prohibited from entering contaminated areas until air sampling and/or visual inspections determine decontamination.

After completion of abatement work, all surfaces from which asbestos has been removed shall be wet brushed, using a nylon brush, wet wiped and sponged or cleaned by an equivalent method to remove all visible material (wire brushes are not permitted). During this work the surfaces being cleaned shall be kept wet. Cleaning shall also include the use of HEPA filtered vacuum equipment.

The Contractor shall also remove and containerize all visible accumulations of asbestos-containing and/or asbestos-contaminated debris which may have splattered or collected on the polyethylene engineering controls/barriers.

The Contractor shall remove contamination from the exteriors of the scaffolding, ladders, extension cords, hoses and other equipment inside the Regulated Area. Cleaning may be accomplished by brushing, HEPA vacuuming and/or wet cleaning. The Contractor shall wet wipe the Regulated Area using cotton rags or lint free paper towels. Rags and towels shall be disposed of after each use. Workers should avoid the use of dirty rags to insure proper cleaning of surfaces. Waste water shall be filtered using best available technology into leak-proof containers prior to being transported to a sanitary sewer for discharge.

Once the Regulated Area surfaces have dried, the Project Monitor shall perform a thorough post abatement visual inspection utilizing protocols from the ASTM Standard E1368-90 *Standard Practice for Visual Inspection of Asbestos Abatement Projects*. All surfaces within the Regulated Area, including but not limited to ledges, beams, and hidden locations shall be inspected for visible residue. Evidence of asbestos contamination identified during this inspection will necessitate further cleaning as heretofore specified. The area shall be re-cleaned at the Contractor's expense, until the standard of cleaning is achieved.

Once the area has received a satisfactory post-abatement visual inspection, any equipment, tools or materials not required for completion of the work, shall be removed by the Contractor from the Regulated Area.

(e) Air Monitoring Requirements

1. The Contractor shall:
 - a. Provide air monitoring equipment including sample filter cassettes of the type and quantity required to properly monitor operations and personnel exposure surveillance throughout the duration of the project.
 - b. Conduct personnel exposure assessment air sampling, as necessary, to assure that workers are using appropriate respiratory protection in accordance with OSHA Standard 1926.1101. Documentation of air

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

2. The Project Monitor, acting as the representative of the Engineer during abatement activities, will:
 - a. Collect air samples in accordance with the current revision of the NIOSH 7400 Method of Air Sampling for Airborne Asbestos Fibers while overseeing the activities of the Abatement Contractor. Frequency and duration of the air sampling during abatement will be representative of the actual conditions at the abatement site. The size and configuration of the asbestos project will be a factor in the number of samples required to monitor the abatement activities and shall be determined by the Project Monitor. The following schedule of samples may be collected by the Project Monitor:
 1. Pre-Abatement (Optional)
 - a. Background areas
 - b. Area(s) adjacent to Work Area(s)
 - c. Work Area(s)
 2. During Abatement (Optional)
 - a. Within Regulated Area(s)
 - b. Area(s) adjacent to Regulated Areas(s) (exterior to critical barriers)
 - c. At the Decontamination Enclosure System

Abatement Activity	Pre-Abatement	During Abatement	Post-Abatement
Exterior Friable/Non-Friable	---	PCM	---

If air samples collected outside of the Regulated Area during abatement activities indicate airborne fiber concentrations greater than original background levels, or greater than 0.1 f/cc, as determined by Phase Contrast Microscopy, whichever is larger, an examination of the Regulated Area perimeter shall be conducted and the integrity of barriers shall be restored. Cleanup of surfaces outside the Regulated Area using HEPA vacuum equipment or wet cleaning techniques shall be done prior to resuming abatement activities.

(f) Post Abatement Work Area Deregulation

The Contractor shall remove all remaining polyethylene, including critical barriers, drop-cloths, and Decontamination Enclosure Systems. HEPA vacuum and/or wet wipe any visible residue which is uncovered during this process. All waste generated during this disassembly process shall be discarded as ACM waste.

A final visual inspection of the work area shall be conducted by the Competent Person and the Project Monitor to ensure that all visible accumulations of suspect materials have been removed and that no equipment or materials associated with the abatement project remain.

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

(g) Waste Disposal

Unless otherwise specified, all removed materials and debris resulting from execution of this project shall become the responsibility of the Contractor and removed from the premises. Materials not scheduled for reuse shall be removed from the site and disposed of in accordance with all applicable Federal, State and Local requirements.

Waste removal dumpsters and cargo areas of transport vehicles shall be lined with a layer of six (6) mil polyethylene sheeting to prevent contamination from leaking or spilled containers. Floor sheeting shall be installed first, and shall be extended up sidewalls 12-inches. Wall sheeting shall overlap floor sheeting 24-inches and shall be taped into place.

OSHA "Danger" signs must be attached to vehicles used to transport asbestos-containing waste prior to loading ACM waste. The signs must be posted so that they are plainly visible.

Ensure all waste containers (bags, drums, etc.) are properly packed, sealed and labeled with USEPA NESHAP generator labels, OSHA danger labels and DOT shipping labels. For each shipment of ACM waste, the Contractor shall complete an EPA-approved asbestos waste shipment record.

Authorized representatives signing waste shipment records on behalf of the generator must have USDOT Shipper Certification training in accordance with HMR 49 CFR Parts 171-180.

Transport vehicles hauling ACM waste shall have appropriate USDOT placards visible on all four (4) sides of the vehicle.

The Contractor shall dispose of asbestos-containing and/or asbestos contaminated material at an EPA authorized site and must be in compliance with the requirements of the Special Waste Provisions of the Office of Solid Waste Management, Department of Energy & Environmental Protection, State of Connecticut, or other designated agency having jurisdiction over solid waste disposal.

Any asbestos-containing and/or asbestos-contaminated waste materials which also contain other hazardous contaminants shall be disposed of in accordance with the EPA's Resource Conservation and Recovery Act (RCRA), CTDEEP and ConnDOT requirements. Materials may be required to be stored on-site and tested by the Project Monitor to determine proper waste disposal requirements.

(h) Project Closeout Data:

1. Provide the Engineer, within 30 days of completion of asbestos abatement, a compliance package; which shall include, but not be limited to, the following:
 - a. Asbestos Abatement Site Supervisor job log;
 - b. OSHA personnel air sampling data;
 - c. Completed waste shipment records.

The Contractor shall submit the original completed waste shipment records to the Engineer.

Method of Measurement:

No measurement will be made for the work in this Section. The completed work shall be paid as a lump sum.

Basis of Payment:

The lump sum bid price for this item shall include the specialty services of the Asbestos Removal Contractor including: labor, materials, equipment, insurance, permits, notifications, submittals, personal air sampling, personal protection equipment, temporary enclosures, utility costs, incidentals, fees and labor incidental to the removal, transport and disposal of ACM, including close out documentation.

Final payment for asbestos abatement will not be made until all the project closeout data submittals have been completed (including waste shipment record(s) signed by an authorized disposal facility representative) and provided to the Engineer. Once the completed package has been received in its entirety, the Engineer will make the final payment to the Contractor.

<u>Pay Item</u>	<u>Pay Unit</u>
Asbestos Abatement	Lump Sum

ITEM #0020903A – LEAD COMPLIANCE FOR MISCELLANEOUS EXTERIOR TASKS

Description:

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

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

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

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

Materials:

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

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

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

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

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

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

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

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

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

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

Construction Methods:

(1) Pre-Abatement Submittals and Notices

A. Prior to the start of **any** work on a contiguous per site basis that will generate hazardous lead waste above conditionally exempt small quantities (greater than 100 kg/month or greater than 1000 kg at any time), the Contractor shall obtain from the Engineer on a contiguous per site basis a temporary EPA Hazardous Waste Generators ID number, unless otherwise directed by the Engineer.

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

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

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

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

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

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

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

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

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

(2) Lead Abatement Provisions

A. General Requirements:

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

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

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

As necessary, the Contractor shall:

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

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

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

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

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

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

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

B. Regulated Area

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

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

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

C. Wash Facilities:

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

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

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

D. Personal Protection:

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

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

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

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

E. Air Monitoring Requirements

The Contractor shall:

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

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

F. Lead Abatement Procedures

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

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

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

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

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

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

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

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

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

Bridge 01218, I-84 EB over Housatonic River, Newtown/Southbury

- Detectable amounts of lead were identified on the painted metal structural steel/metal bridge component surfaces of Bridge No. 01218.

Girders, Cross Beams, Beam Ends, Bearings, Rockers, Diaphragms, Connection plates, etc.	Metal	Grey/Blue	3.0-8.0 mg/cm ²
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- TCLP waste stream sampling/analysis of the paint associated with the metal structural steel/metal bridge component surfaces characterized the paint waste as non-hazardous, non-RCRA waste.

Paint debris (structural steel/metal bridge components)	0.39 mg/l
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Bridge 04180, I-84 WB over Housatonic River, Newtown/Southbury

- Detectable amounts of lead were identified on the painted metal structural steel/metal bridge component surfaces of Bridge No. 04180.

Girders, Cross Beams, Beam Ends, Bearings, Rockers, Diaphragms, Connection plates, etc.	Metal	Tan/Beige	2.5-5.9 mg/cm ²
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- TCLP waste stream sampling/analysis of the paint associated with the metal structural steel/metal bridge component surfaces characterized the paint waste as RCRA/CTDEEP hazardous waste.

Paint debris (structural steel/metal bridge components)	24 mg/l
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While conducting work to the bridges, where it is necessary to impact the lead painted surfaces, the Contractor shall either:

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

- b. Impact the substrate using mechanical means with the paint in place in accordance with OSHA Lead in Construction Standard 29CFR 1926.62.**

The Contractor shall submit a Work Plan to ConnDOT outlining the exact procedures that will be used to perform the work, contain the spread of lead debris and protect the employees performing the required renovation work impacting the lead paint. No work shall be started by the Contractor until the Work Plan is approved by the Engineer.

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

The Engineer has characterized the paint waste stream associated with the structural steel and metal bridge components at Bridge No. 01218 as non-hazardous. If the paint is removed from the structural steel and/or metal bridge component surfaces, the paint shall be handled and disposed of as non-hazardous, non-RCRA waste under this Item 0020903A.

The Engineer has characterized the paint waste stream associated with the structural steel and metal bridge components at Bridge No. 04180 as CTDEEP/RCRA hazardous waste. If the paint is removed from the structural steel and/or metal bridge component surfaces, the paint shall be handled and disposed of in accordance with USEPA/CTDEEP Hazardous Waste Regulations as described under this Item 0020903A.

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

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

Special Requirements:

1. Demolition/Renovation:
 - a. Demolish/renovate in a manner which minimizes the spread of lead contamination and generation of lead dust.

- b. Implement dust suppression controls, such as misters, local exhaust ventilation, etc. to minimize the generation of airborne lead dust.
 - c. Segregate work areas from non-work areas through the use of barrier tape, drop cloths, etc.
 - d. Clean up immediately after renovation/demolition has been completed
2. Chemical Removal:
- a. Apply chemical stripper in quantities and for durations specified by manufacturer.
 - b. Where necessary, scrape lead paint from surface down to required level of removal (i.e. stabilized surface, bare substrate with no trace of residual pigment, etc.). Use sanding, hand scraping, and dental picks to supplement chemical methods as necessary.
 - c. Apply neutralizer compatible with substrate and chemical agent to substrate following removal in accordance with manufacturer's instructions.
 - d. Protect adjacent surfaces from damage from chemical removal.
 - e. Maintain a portable eyewash station in the work area.
 - f. Wear respirators that will protect workers from chemical vapors.
 - g. Do not apply caustic agents to aluminum surfaces.
3. Mechanical Paint Removal:
- a. Provide sanders, grinders, rotary wire brushes, or needle gun removers equipped with a HEPA filtered vacuum dust collection system. Cowling on the dust collection system for orbital-type tools must be capable of maintaining a continuous tight seal with the surface being abated. Cowling on the dust collection system for reciprocating-type tools shall promote an effective vacuum flow of loosened dust and debris. Inflexible cowlings may be used on flat surfaces only. Flexible contoured cowlings are required for curved or irregular surfaces.
 - b. Provide HEPA vacuums that are high performance designed to provide maximum static lift and maximum vacuum system flow at the actual operating vacuum condition with the shroud in use. The HEPA vacuum shall be equipped with a pivoting vacuum head.

- c. Remove lead paint from surface down to required level of removal (i.e. stabilized surface, bare substrate with no trace of residual pigment, etc.). Use chemical methods, hand scraping, and dental picks to supplement abrasive removal methods as necessary.
 - d. Protect adjacent surfaces from damage from abrasive removal techniques.
 - e. “Sandblasting” type removal techniques shall not be allowed.
4. Component Removal/Replacement:
- a. Wet down components which are to be removed to reduce the amount of dust generated during the removal process.
 - b. Remove components utilizing hand tools, and follow appropriate safety procedures during removal. Remove the components by approved methods which will provide the least disturbance to the substrate material. Do not damage adjacent surfaces.
 - c. Clean up immediately after component removals have been completed. Remove any dust located behind the component removed.

G. Prohibited Removal Methods:

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

The use of sand, steel grit, air, CO₂, baking soda, or any other blasting media to remove lead or lead paint without the use of a HEPA ventilated contained negative pressure enclosure is prohibited.

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

Compressed air shall not be utilized to remove lead paint.

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

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

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

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

H. Clean-up and Visual Inspection:

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

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

The Engineer will conduct a visual inspection of the work areas in order to document that all surfaces have been maintained as free as practicable of accumulations of lead in accordance with 29 CFR 1926.62(h). If visible accumulations of waste, debris, lead paint chips or dust are found in the work area, the Contractor shall repeat the cleaning, at the Contractor's expense, until the area is in compliance. The visual inspection will detect incomplete work, damage caused by the abatement activity, and inadequate clean up of the work site.

I. Post-Work Regulated Area Deregulation:

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

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

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

J. Waste Disposal/Recycling:

Non-metallic building debris waste materials tested and found to be non-hazardous shall be disposed of properly at a CTDEEP approved Solid Waste landfill as described under this Item 0020903A.

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

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

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

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

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

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

Clean Earth of North Jersey, Inc., (CENJ) 115 Jacobus Avenue, South Kearny, NJ 07105 Phone: (973) 344-4004; Fax: (973) 344-8652	Clean Harbors Environmental Services, Inc. 2247 South Highway 71, Kimball, NE 69145 Phone: (308) 235-8212; Fax: (308) 235-4307
Clean Harbors of Braintree, Inc. 1 Hill Avenue, Braintree, MA 02184 Phone: (781) 380-7134; Fax: (781) 380-7193	ACV Enviro(CycleChem)(General Chem Co) 217 South First Street, Elizabeth, NJ 07206 Phone: (908) 355-5800; Fax (908) 355-0562
Triumverate (EnviroSafe Corp Northeast) (Jones Environmental Services (NE), Inc.) 263 Howard Street, Lowell, MA 01852 Phone: (978) 453-7772; Fax: (978) 453-7775	US Ecology Environmental Quality Detroit, Inc. 1923 Frederick Street, Detroit, MI 48211 Phone: (800) 495-6059; Fax: (313) 923-3375
Stericycle (Republic Environmental Systems) 2869 Sandstone Drive, Hatfield, PA 19440 Phone: (215) 822-8995; Fax: (215) 997-1293	Clean Harbors – Spring Grove Facility 4879 Spring Grove Ave, Cincinnati OH 45322 Phone: (513) 681-6242; Fax: (513) 681-0869
Envirite of PA (US Ecology) 730 Vogelsong Road, York, PA 17404 Phone: (717) 846-1900; Fax: (717) 854-6757	Stablex, Canada, Inc. 760 Industrial Bl, Blainville Quebec J7C3V4 Phone: (451) 430-9230; Fax: (451) 430-4642
Environmental Quality Company: Wayne Disposal Facility 49350 North I-94 Service Drive Belleville, MI 48111 Phone: (800) 592-5489; Fax: (800) 592-5329	Stericycle (Northland Environmental, Inc.) (PSC Environmental Systems) 275 Allens Avenue, Providence, RI 02905 Phone: (401) 781-6340; Fax: (401) 781-9710

The Contractor shall submit in writing (1) a letter listing the names of the hazardous waste disposal facilities (from the above list) that the Contractor will use to receive hazardous material from this Project, and (2) a copy of each facility's acceptance criteria and sampling frequency requirements.

Failure to comply with all of the above requirements may result in the rejection of the bid.

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

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

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

All debris shall be contained and collected daily or more frequently as directed by the Engineer, due to debris buildup. Debris shall be removed by HEPA vacuum collection. Such debris and paint chips shall be stored in leak-proof storage containers in the secured storage site, or as directed by the Engineer. The storage containers and storage locations shall be reviewed by the Engineer and shall be located in areas not subject to ponding. Storage containers shall be placed on pallets and closed and covered with tarps at all times except during placement, sampling and disposal of the debris.

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

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

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

Direct paint related debris materials not previously sampled and characterized for disposal, which may be originally presumed to be hazardous waste, shall also be stored separately and

sampled by the Engineer for ultimate waste disposal characterization testing and handled/disposed of based on that testing.

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

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

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

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

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

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

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

- All vehicles departing the site are to be properly logged to show the vehicle

identification, driver's name, time of departure, destination, and approximate volume, and contents of materials carried. Vehicles shall display the proper USDOT placards for the type and quantity of waste;

- No materials shall leave the site unless a disposal facility willing to accept all of the material being transported has agreed to accept the type and quantity of waste;
- Documentation must be maintained indicating that all applicable laws have been satisfied and that the materials have been successfully transported and received at the disposal facility; and,
- The Contractor shall segregate the waste streams (i.e. concrete, wood, etc.) as directed by the receiving disposal facility.

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

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

K. Project Closeout Data:

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

1. Competent persons (supervisor) job log;
2. OSHA-compliant personnel air sampling data;
3. Completed waste shipment papers for non-hazardous lead construction and demolition (C&D) waste disposal or recycling and scrap metal recycling.
4. Copies of completed Hazardous Waste Manifests (signed by authorized disposal facility representative).

Method of Measurement:

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

Basis of Payment:

The lump sum price bid for this item shall include: services, materials, equipment, all permits, notifications, submittals, personal air sampling, personal protection equipment, temporary enclosures, incidentals, fees and labor incidental to activities impacting lead removal, treatment

and handling of lead contaminated materials, and the transport and disposal of any hazardous and/or non-hazardous lead construction and demolition (C&D) bulky waste.

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

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

END OF SECTION

ITEM #0100424A—WATER TRANSPORTATION FOR INSPECTION PERSONNEL

Description: The Contractor shall furnish, maintain and operate a water transportation boat for access to and from work areas that require Department inspection. This boat shall be used solely for inspection access and shall be available upon request of the Engineer, until the in-water work subject to inspection is completed and accepted. The Contractor shall also obtain all necessary permits and licenses for the boat and its operators.

Construction Methods: Work under this item shall be performed in accordance with the following requirements:

1. The water transportation boat shall have the capacity to transport one (1) operator and up to four (4) inspectors.
2. The water transportation boat shall be available for transportation services within thirty (30) minutes of the Engineer’s request.
3. The water transportation boat shall be equipped with oars and a motor whose power is within the minimum and maximum horsepower requirements indicated by the manufacturer of the boat provided.
4. The boat shall be equipped with the required safety equipment: life vests, protective clothing, life line, anchor, emergency first aid kit.
5. A communication system, such as a walkie-talkie, shall be used to inform the water transportation boat operator of a need for transportation and a pickup location. The operator and the Engineer shall be equipped with a communication device.
6. There must be at least one person present and specifically designated to operate the water transportation boat at all times.
7. The designated operator must either man the water transportation boat at all times or remain in the immediate area such that the operator can quickly reach the water transportation boat.
8. When the operator is on break, another operator must be designated to provide the requisite coverage when there is a need for water transportation.
9. In the event of a breakdown, in-water work subject to inspection may be discontinued until the water transportation boat is repaired or a replacement water transportation boat is provided.

Method of Measurement: Water Transportation for Inspection Personnel, being paid for on a lump sum basis, will not be measured for payment. The Contractor shall submit a proposed schedule of values to the Engineer for review and approval.

Basis of Payment: This work will be paid for at the Contract lump sum price for “Water Transportation for Inspection Personnel,” which price shall include all labor, equipment, materials, maintenance, fuel, repairs, storage and services incidental thereto.

Pay Item	Pay Unit
Water Transportation for Inspection Personnel	l.s.

ITEM #0100427A - WATER RESCUE OPERATIONS

Description: The Contractor shall furnish, maintain and operate one or more water rescue operation boat(s) for Contract work over or adjacent to water. The boat shall patrol in the vicinity of each above-water work location and be available for water rescue operations. These water safety measures will be required to protect all Contractor and Department staff. The Contractor shall also obtain all necessary permits and licenses for the boat and its operators. This boat shall be separate from the boat identified and used as part of Item #0100424A Water Transportation for Inspection Personnel.

Construction Methods: Work under this item shall be performed in accordance with OSHA Article 29 CFR 1926.106 and the following requirements:

1. Boat(s) shall be a minimum of twenty (20) feet in length with a stable, flat-bottom and shall be designed specifically for emergency life-rescuing operation.
2. Boat(s) shall be equipped with oars and a motor with power within the minimum and maximum horsepower requirements indicated by the manufacturer of the boat(s) provided.
3. Each boat shall be equipped with required safety equipment: life vests, protective clothing, life line, anchor, emergency first aid kit, oxygen equipment and backboard.
4. A communication system, such as a walkie-talkie, shall be used to inform the boat operator(s) of an emergency and to inform the operator(s) where the boat is needed. The operator(s) and at least one worker at each work location over water shall be equipped with a communication device.
5. The operator(s) must possess the following current certifications issued by the American Red Cross or equivalent certifications approved by the Engineer:
 - Adult First Aid including CPR training
 - Life Guard Training or Water Rescue Operations
6. Boat(s) shall remain in the water when workers are above water and must be capable of being quickly launched to respond to an emergency within three (3) to four (4) minutes.
7. There must be at least two (2) rescue operators available on-board each boat when work is being performed over or adjacent to water.
8. Each boat shall be operable and available at all times when work is being performed over or adjacent to water. In the event of a breakdown, above-water work must be discontinued until a boat is repaired or a replacement boat is on Site and in the water.
9. The number of boats required must be determined based on the following:
 - The number of work locations where there is a danger of falling into water
 - The distance to each of those locations
 - Water temperature, currents, dams, rapids and other hazards
 - Appropriate response times for rescue

Method of Measurement: Water Rescue Operations, being paid for on a lump sum basis, will not be measured for payment. The Contractor shall submit a proposed schedule of values to the Engineer for review and approval.

Basis of Payment: This work will be paid for at the Contract lump sum price for “Water Rescue Operations,” which price shall include all labor, equipment, materials, maintenance, fuel, repairs, storage and services incidental thereto.

Pay Item	Pay Unit
Water Rescue Operations	l.s.

ITEM #0101000A - ENVIRONMENTAL HEALTH AND SAFETY**Description:**

Under this item, the Contractor shall establish protocols and provide procedures to protect the health and safety of its employees and subcontractors as related to the proposed construction activities performed within the Project AOEC and SED-LLAOEC. Work under this Item consists of the development and implementation of a written HASP that addresses the relative risk of exposure to documented hazards present within Project limits. The HASP shall establish health and safety protocols that address the relative risk of exposure to regulated substances in accordance with 29 CFR 1910.120 and 29 CFR 1926.65. Such protocols shall only address those concerns directly related to site conditions.

Note: The Engineer will prepare a site-specific health and safety plan which is compatible with the Contractor's plan and will be responsible for the health and safety of all Project Inspectors, Department employees and consulting engineers.

Materials:

The Contractor must provide chemical protective clothing (CPC) and personal protective equipment (PPE) as stipulated in the Contractor's HASP during the performance of work in areas identified as potentially posing a risk to worker health and safety for workers employed by the Contractor and all subcontractors.

Construction Methods:

1-Existing Information: The Contractor shall utilize all available information and existing records and data pertaining to chemical and physical hazards associated with any of the regulated substances identified in the environmental site investigations to develop the HASP. A list of documents containing this data is found in "Notice to Contractor – Environmental Investigations".

2-General: The requirements set forth herein pertain to the provision of workers' health and safety as it relates to proposed Project activities when performed in the presence of hazardous or regulated materials or otherwise environmentally sensitive conditions. THE PROVISION OF WORKER HEALTH AND SAFETY PROTOCOLS WHICH ADDRESS POTENTIAL AND/OR ACTUAL RISK OF EXPOSURE TO SITE SPECIFIC HAZARDS POSED TO CONTRACTOR EMPLOYEES IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.

The Contractor shall be responsible for the development, implementation and oversight of the HASP throughout the performance of work within the limits of the AOEC and SED-LLAOEC, as identified in the Contract Documents, and in other areas identified by the Engineer or by the HASP where site conditions may pose a risk to worker health and safety and/or the environment.

No physical aspects of the work within the AOEC or SED-LLAOEC shall begin until the HASP is reviewed by the Engineer and is determined to meet the requirements of the specifications. However, the Contract time, in accordance with Article 1.03.08, will begin on the date stipulated in the Notice to Proceed.

3-Regulatory Requirements: All construction related activities performed by the Contractor within the limits of the AOEC/SED-LLAOEC or in other areas where site conditions may pose a risk to worker health and safety and/or the environment shall be performed in conformance with 29 CFR 1926, Safety and Health Regulations for Construction and 29 CFR 1910, Safety and Health Regulations for General Industry. Conformance to 29 CFR 1910.120, Hazardous Waste Site Operations and Emergency Response (HAZWOPER) may also be required, where appropriate.

4-Submittals: Three copies of the HASP shall be submitted to the Engineer within four (4) weeks after the Award of Contract or four (4) weeks prior to the start of any work in the AOEC or SED-LLAOEC, whichever is first, but not before the Award of the Contract.

The HASP shall be developed by a qualified person designated by the Contractor. This qualified person shall be a Certified Industrial Hygienist (CIH), Certified Hazardous Material Manager (CHMM), or a Certified Safety Professional (CSP). He/she shall have review and approval authority over the HASP and be identified as the Health and Safety Manager (HSM). The HASP shall bear the signature of said HSM indicating that the HASP meets the minimum requirements of 29 CFR 1910.120 and 29 CFR 1926.65.

The Engineer will review the HASP(s) within four (4) weeks of submittal and provide written comments as to deficiencies in and/or exceptions to the plan(s), if any, to assure consistency with the specifications, applicable standards, policies and practices and appropriateness given potential or known site conditions. Items identified in the HASP which do not conform to the specifications will be brought to the attention of the Contractor, and the Contractor shall revise the HASP to correct the deficiencies and resubmit it to the Engineer for determination of compliance with this item. The Contractor shall not be allowed to commence work activities in the AOEC or SED-LLAOEC, as shown on the Plan, or where site conditions exist which may pose a risk to worker health and safety and/or the environment, until the HASP has been reviewed and accepted by the Engineer. No claim for delay in the progress of work will be considered for the Contractor's failure to submit a HASP that conforms to the requirements of the Contract.

5-HASP Provisions:

(a) General Requirements: The Contractor shall prepare a HASP covering all Project site work regulated by 29 CFR 1910.120(b)/ 1926.65(b) to be performed by the Contractor and all subcontractors under this Contract. The HASP shall establish in detail, the protocols necessary for the recognition, evaluation, and control of all hazards associated with each task performed under this Contract. The HASP shall address site-specific safety and health hazards of each phase of site operation and include the requirements

and procedures for employee protection. The level of detail provided in the HASP shall be tailored to the type of work, complexity of operations to be performed, and hazards anticipated. Details about some activities may not be available when the initial HASP is prepared and submitted. Therefore, the HASP shall address, in as much detail as possible, all anticipated tasks, their related hazards and anticipated control measures.

The HASP shall interface with the Contractor's Safety and Health Program. Any portions of the Safety and Health Program that are referenced in the HASP shall be included as appendices to the HASP. All topics regulated by the 29 CFR 1910.120(b)(4) and those listed below shall be addressed in the HASP. Where the use of a specific topic is not applicable to the Project, the HASP shall include a statement to justify its omission or reduced level of detail and establish that adequate consideration was given the topic.

(b) Elements:

(i) Site Description and Contamination Characterization: The Contractor shall provide a site description and contaminant characterization in the HASP that meets the requirements of 29 CFR 1910.120/1926.65.

(ii) Safety and Health Risk Analysis/Activity Hazard Analysis: The HASP shall address the safety and health hazards on this site for every operation to be performed. The Contractor shall review existing records and data to identify potential chemical and physical hazards associated with the site and shall evaluate their impact on field operations. Sources, concentrations (if known), potential exposure pathways, and other factors as noted in CFR 1910.120/126.65, paragraph (c)(7) employed to assess risk shall be described. The Contractor shall develop and justify action levels for implementation of engineering controls and personal protective equipment upgrades and downgrades for controlling worker exposure to the identified hazards. If there is no permissible exposure limit (PEL) or published exposure level for an identified hazard, available information from other published studies may be used as guidance. Any modification of an established PEL must be fully documented.

The HASP shall include a comprehensive section that discusses the tasks and objectives of the site operations and logistics and resources required to complete each task. The hazards associated with each task shall be identified. Hazard prevention techniques, procedures and/or equipment shall be identified to mitigate each of the hazards identified.

(iii) Staff Organization, Qualifications and Responsibilities: The HASP shall include a list of personnel expected to be engaged in site activities and certify that said personnel have completed the educational requirements stipulated in 29 CFR 1910.120 and 29 CFR 1926.65, are currently monitored under a medical surveillance program in compliance with those regulations, and that they are fit for work under "level C" conditions.

The Contractor shall assign responsibilities for safety activities and procedures. An outline or flow chart of the safety chain of command shall be provided in the HASP.

Qualifications, including education, experience, certifications, and training in safety and health for all personnel engaged in safety and health functions shall be documented in the HASP. Specific duties of each on-site team member should be identified. Typical team members include but are not limited to Team Leader, Scientific Advisor, Site Safety Officer, Public Information Officer, Security Officer, Record Keeper, Financial Officer, Field Team Leader, and Field Team members.

The HASP shall also include the name and qualifications of the individual proposed to serve as Health and Safety Officer (HSO). The HSO shall have full authority to carry out and ensure compliance with the HASP. The Contractor shall provide a competent HSO on-site who is capable of identifying existing and potential hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to employees and who has authorization to take prompt corrective measures to eliminate or control them. The qualifications of the HSO shall include completion of OSHA 40-hour HAZWOPER training, including current 8-hour refresher training, and 8-hour HAZWOPER supervisory training; a minimum of one year of working experience with the regulated compounds that have been documented to exist within Project limits; a working knowledge of Federal and State safety regulations; specialized training or documented experience (one year minimum) in personal and respiratory protective equipment program implementation; the proper use of air monitoring instruments, air sampling methods and procedures; and certification training in first aid and CPR by a recognized, approved organization such as the American Red Cross.

The primary duties of the HSO shall be those associated with worker health and safety. The Contractor's HSO responsibilities shall be detailed in the written HASP and shall include, but not be limited to the following:

- (A) Directing and implementing the HASP.
- (B) Ensuring that all Project personnel have been adequately trained in the recognition and avoidance of unsafe conditions and the regulations applicable to the work environment to control or eliminate any hazards or other exposure to illness or injury (29 CFR 1926.21). All personnel shall be adequately trained in procedures outlined in the Contractor's written HASP.
- (C) Authorizing Stop Work Orders, which shall be executed upon the determination of an imminent health and safety concern.
- (D) Contacting the Contractor's HSM and the Engineer immediately upon the issuance of a Stop Work order when the HSO has made the determination of an imminent health and safety concern.
- (E) Authorizing work to resume, upon approval from the Contractor's HSM.
- (F) Directing activities, as defined in the Contractor's written HASP, during

emergency situations; and

(G) Providing personal monitoring where applicable, and as identified in the HASP.

(iv) Employee Training Assignments: The Contractor shall develop a training program to inform employees, supplier's representatives, and official visitors of the special hazards and procedures (including PPE, its uses and inspections) to control these hazards during field operations. Official visitors include but are not limited to Federal Agency Representatives, State Agency Representatives, Municipal Agency Representatives, Contractors, subcontractors, etc. This program shall be consistent with the requirements of 29 CFR 1910.120 and 29 CFR 1926.65.

(v) Personal Protective Equipment: The plan shall include the requirements and procedures for employee protection and should include a detailed section on respiratory protection. The Contractor shall describe in detail and provide appropriate personal protective equipment (PPE) to ensure that workers are not exposed to levels greater than the action level for identified hazards for each operation stated for each work zone. The level of protection shall be specific for each operation and shall be in compliance with all requirements of 29 CFR 1910 and 29 CFR 1926. The Contractor shall provide, maintain, and properly dispose of all PPE.

(vi) Medical Surveillance Program: All on-site Contractor personnel engaged in 29 CFR 1910.120/1926.65 operations shall have medical examinations meeting the requirements of 29 CFR 1910.120(f) prior to commencement of work.

The HASP shall include certification of medical evaluation and clearance by the physician for each employee engaged in 29 CFR 1910.120/1926.65 operations at the site.

(vii) Exposure Monitoring/Air Sampling Program: The Contractor shall submit an Air Monitoring Plan as part of the HASP which is consistent with 29 CFR 1910.120, paragraphs (b)(4)(ii)(E), (c)(6), and (h). The Contractor shall identify specific air sampling equipment, locations, and frequencies in the air-monitoring plan. Air and exposure monitoring requirements shall be specified in the Contractor's HASP. The Contractor's CIH shall specify exposure monitoring/air sampling requirements after a careful review of the contaminants of concern and planned site activities.

(viii) Site Layout and Control: The HASP shall include a map, work zone delineation (support, contamination, reduction and exclusion), on/off-site communications, site access controls, and security (physical and procedural).

(ix) Communications: Written procedures for routine and emergency communications procedures shall be included in the Contractor's HASP.

(x) Personal Hygiene, Personal Decontamination and Equipment Decontamination: Decontamination facilities and procedures for personnel protective equipment, sampling equipment, and heavy equipment shall be discussed in detail in the HASP.

(xi) Emergency Equipment and First Aid Requirements: The Contractor shall provide appropriate emergency first aid kits and equipment suitable to treat exposure to the hazards identified, including chemical agents. The Contractor will provide personnel that have certified first aid/CPR training on site at all times during site operations.

(xii) Emergency Response Plan and Spill Containment Program: The Contractor shall establish procedures in order to take emergency action in the event of immediate hazards (i.e., a chemical agent leak or spill, fire or personal injury). Personnel and facilities supplying support in emergency procedures will be identified. The emergency equipment to be present at the site and the Emergency Response Plan procedures, as required 29 CFR 1910.120, paragraph (1)(1)(ii) shall be specified in the Emergency Response Plan. The Emergency Response Plan shall be included as part of the HASP. This Emergency Response Plan shall include written directions to the closest hospital as well as a map showing the route to the hospital.

(xiii) Logs, Reports and Record Keeping: The Contractor shall maintain safety inspections, logs, and reports, accident/incident reports, medical certifications, training logs, monitoring results, etc. All exposure and medical monitoring records are to be maintained according to 29 CFR 1910 and 29 CFR 1926. The format of these logs and reports shall be developed by the Contractor to include training logs, daily logs, weekly reports, safety meetings, medical surveillance records, and a phase-out report. These logs, records, and reports shall be maintained by the Contractor and be made available to the Engineer.

The Contractor shall immediately notify the Engineer of any accident/incident. Within two working days of any reportable accident/incident, the Contractor shall complete and submit to the Engineer an accident report.

(xiv) Confined space entry procedures: Confined space entry procedures, both permit- and non-permit required, shall be discussed in detail.

(xv) Pre-entry briefings: The HASP shall provide for pre-entry briefings to be held prior to initiating any site activity and at such other times as necessary to ensure that employees are apprised of the HASP and that this plan is being followed.

(xvi) Inspections/audits: The HSM or HSO shall conduct inspections or audits to determine the effectiveness of the HASP. The Contractor shall correct any deficiencies in the effectiveness of the HASP.

6-HASP Implementation: The Contractor shall implement and maintain the HASP throughout the performance of work. In areas identified as having a potential risk to worker health and safety, and in any other areas deemed appropriate by the HSO, the Contractor shall be prepared

to immediately implement the appropriate health and safety measures, including but not limited to the use of personal protective equipment (PPE), and engineering and administrative controls.

If the Engineer observes deficiencies in the Contractor's operations with respect to the HASP, they shall be assembled in a written field directive and given to the Contractor. The Contractor shall immediately correct the deficiencies and respond, in writing, as to how each was corrected. Failure to bring the work area(s) and implementation procedures into compliance will result in a Stop Work Order and a written directive to discuss an appropriate resolution(s) to the matter. When the Contractor demonstrates compliance, the Engineer shall remove the Stop Work Order. If a Stop Work Order has been issued for cause, no delay claims on the part of the Contractor will be honored.

Disposable CPC/PPE, i.e. disposable coveralls, gloves, etc., which come in direct contact with hazardous or potentially hazardous material shall be placed into 55-gallon USDOT 17-H drums and disposed of in accordance with Federal, State, and local regulations. The drums shall be temporarily staged and secured within the WSA until the material is appropriately disposed.

7-HASP Revisions: The HASP shall be maintained at the site by the Contractor and shall be kept current with construction activities and site conditions under this Contract. The HASP shall be recognized as a flexible document which shall be subject to revisions and amendments, as required, in response to actual site conditions, changes in work methods and/or alterations in the relative risk present. All changes and modifications shall be signed by the Contractor's HSM and shall require the review and acceptance by the Engineer prior to the implementation of such changes.

Should any unforeseen hazard become evident during the performance of the work, the HSO shall bring such hazard to the attention of the Contractor and the Engineer as soon as possible. In the interim, the Contractor shall take action including; Stop Work Orders and/or upgrading PPE as necessary to re-establish and maintain safe working conditions and to safeguard site personnel, visitors, the public and the environment. The HASP shall then be revised/amended to reflect the changed condition.

Method of Measurement:

1-Within thirty (30) calendar days of the award of the Contract, the Contractor shall submit to the Engineer for acceptance a breakdown of its lump sum bid price for this item detailing:

- (a) The development costs associated with preparing the HASP in accordance with these Specifications.
- (b) The cost per month for the duration of the Project to implement the HASP and provide the services of the HSM and the HSO.

2-If the lump sum bid price breakdown is unacceptable to the Engineer; substantiation showing that the submitted costs are reasonable shall be required.

3-Upon acceptance of the payment schedule by the Engineer, payments for work performed will be made as follows:

- (a) The lump sum development cost will be certified for payment.
- (b) The Contractor shall demonstrate to the Engineer monthly that the HASP has been kept current and is being implemented and the monthly cost will be certified for payment.
- (c) Any month where the HASP is found not to be current or is not being implemented, the monthly payment for the Environmental Health and Safety Item shall be deferred to the next monthly payment estimate. If the HASP is not current or being implemented for more than thirty calendar days, there will be no monthly payment.
- (d) Failure of the Contractor to implement the HASP in accordance with this Specification shall result in the withholding of all Contract payments.

Basis of Payment:

This work will be paid for at the Contract lump sum price for “Environmental Health and Safety” which price shall include all materials, tools, equipment and labor incidental to the completion of this item for the duration of the Project to maintain, revise, monitor and implement the HASP. Such costs include providing the services of the HSM and HSO, Contractor employee training, chemical protective clothing (CPC), personal protective equipment (PPE), disposal of PPE and CPC, medical surveillance, decontamination facilities, engineering controls, monitoring and all other HASP protocols and procedures established to protect the Health and Safety for all on-site workers.

<u>Pay Item</u>	<u>Pay Unit</u>
Environmental Health and Safety	L.S.

**ITEM #0101128A - SECURING, CONSTRUCTION AND DISMANTLING
OF A WASTE STOCKPILE AND TREATMENT AREA**

Description:

Work under this Item shall consist of the securing, construction and dismantling of the temporary Waste Stockpile Area (WSA) at the location designated on the Project Plans and in accordance with the Contract. All sediments excavated from the SED-LLAOEC during construction activities shall be removed of free-draining liquids, loaded, transported and stockpiled in the WSA. The WSA shown on the Plans is to be used exclusively for the temporary stockpiling of excavated sediments for determination of disposal classification prior to offsite disposal.

Materials:

The required materials are detailed on the Project Plans. All materials shall conform to the requirements of the Contract.

Construction blocks shall be solid precast rectangular concrete six (6) feet in length, three (3) feet in height, and two (2) feet in depth.

Polyethylene plastic sheeting for underlayment shall be a thickness of 30 mil and minimum width of ten (10) feet. Polyethylene plastic sheeting for covering shall be a thickness of 10 mil and a minimum width of ten (10) feet.

Sand bags used to secure polyethylene sheeting soil covers shall have a minimum weight of thirty (30) pounds.

Bedding sand shall conform to Section 6.51 of the Specifications.

Processed Aggregate Base shall conform to Section 3.04 of the Specifications.

Hay bales shall conform to the requirements of Section 2.18 of the Specifications.

Bituminous Concrete shall conform to Section 4.06 of the Specifications.

Roll-off/Storage Containers shall be of watertight, steel-body construction, of the size specified and able to handle the storage and subsequent transportation of material to the disposal facility.

Precast Concrete Barrier Curb shall conform to Section 8.22 of the Specifications.

Construction Methods:

The WSA shall be constructed in accordance with the Contract at the location shown on the Project Plans.

Construction of the WSA shall be completed prior to the initiation of construction activities generating sediments from within the SED-LLAOEC. The Contractor is responsible for the maintenance and protection of all utilities potentially affected during WSA construction. The Contractor shall locate and mark all existing utilities potentially affected prior to initiating WSA construction.

The proposed location of the WSA shall be cleared of any debris and vegetation as directed by the Engineer. Any objectionable materials, which may result in damage to the polyethylene sheeting underlayment, shall be removed prior to stockpiling excavated sediments.

The Contractor shall comply with the terms and conditions of the most recent DEEP “General Permit for Contaminated Soil and/or Sediment Management (Staging and Transfer)”, including the General Operating Conditions and the Specific Operating Conditions, except that the Engineer will conduct all soil/sediment characterization and perform all record keeping. In particular, the Contractor shall:

1. Construct and repair the WSA in conformance with the requirements of the General Permit.
2. Prevent unauthorized entry onto the stockpiles by the use of fences, gates, or other natural or artificial barriers.
3. Install anti-tracking measures at the WSA to ensure the vehicles do not track sediments from the WSA onto a public roadway at any time.
4. Post and maintain a sign that is visible from a distance of at least 25 feet at the WSA identifying the name of the permittee (State of CT, Department of Transportation), the DOT field office phone number, the hours of operation for the WSA, and the phrase, “Temporary Soil Staging Area”. Lettering shall be at least 1 inch high with a minimum overall sign dimension of 4 feet wide by 2 feet high. Such sign is only required if the capacity of the WSA is equal to or greater than 1,000 cubic yards. If initially the WSA capacity is less than 1,000 cubic yards and the WSA capacity is subsequently increased, the Contractor shall post and maintain the required sign at no additional cost to the State, prior to stockpiling the additional material.

Following the removal of all stockpiled sediments, the Contractor shall use dry decontamination procedures for all surfaces of the WSA as directed by the Engineer. Residual materials shall be disposed of as sediments. If the results from dry methods are unsatisfactory to the Engineer, the Contractor shall modify decontamination procedures as required.

The Contractor shall be responsible for the collection and treatment/recycling/disposal of any liquid wastes that may be generated by its decontamination activities in accordance with applicable regulations.

Upon completion of the Project and following removal of all residual sediments, the Contractor shall dismantle the WSA and return the area to original condition. During dismantling, the Contractor shall remove all materials such as polyethylene sheeting and sand bags. Materials shall be disposed of by the Contractor as solid waste in accordance with the Contract and all Federal, State and local regulations.

Operation and maintenance of the WSA shall be included under Item 0020762A – Sediment Handling”.

Method of Measurement:

This work will be measured for payment at the Lump Sum cost for securing, construction, and dismantling of a WSA.

Basis of Payment:

This work will be paid for at the Contract Lump Sum, which shall include all materials, tools, labor, equipment, permits, and work needed to secure, construct, decontaminate and dismantle the WSA, including all clearing, grubbing, grading, clean up, site restoration and seeding.

All materials, labor and equipment associated with compliance with the most current General Permit for Contaminated Soil and/or Sediment Management (Staging and Transfer) will not be measured separately but will be considered incidental to the item “Securing, Construction and Dismantling of a Waste Stockpile and Treatment Area”.

Pay Item

Pay Unit

Securing, Construction and Dismantling
Of A Waste Stockpile and Treatment Area

L.S.

ITEM #0101130A - ENVIRONMENTAL WORK - SOLIDIFICATION

Description:

Under this item, the Contractor shall be responsible for the solidification of sediments containing free draining liquids, as may be necessary during the performance of work operations prior to off-site disposal. Materials shall be dewatered prior to the addition of solidification material.

The Contractor shall submit within seven (7) days of the Notice to Proceed, for the Engineer's review, a detailed methodology and plan of operation for the solidification of materials.

Materials:

The materials used for solidification shall be a naturally occurring material such as diatomaceous earth or other material as approved by the Engineer. Said material shall be in a dry state prior to use in solidification operations. No polymers or other synthetic materials shall be allowed.

Construction Methods:

Submittals:

The Contractor shall submit for the Engineer's review, a plan showing the location of solidification material storage and proposed mixing location as well as a detailed narrative describing the equipment, materials and methodology to be used. The Contractor shall also include its planned methods to remove or drain away free water prior to the addition of any solidification materials to the sediments. The methodology shall completely describe the Contractor's proposed plan for removal of free liquids (as determined by ASTM) from the excavated materials. Should solidification fail to eliminate free liquids as proposed, the Contractor will be required to revise the solidification plan at no additional cost to the State.

Upon visual examination, if sediments have free liquids present, the Contractor may, with concurrence of the Engineer, add dry materials to absorb free-standing liquids, utilizing a methodology accepted by the Engineer. The Contractor shall dewater sediments prior to the addition of solidification materials to the satisfaction of the Engineer. All dewatering fluids shall be handled in accordance with the Contract. Solidification procedures shall be subject to monitoring by the Engineer.

The maximum quantity of solidification material that may be used by the Contractor shall be limited to twenty (20) percent, by volume, of the material being solidified. Should this procedure be demonstrated as not effective in the elimination of the presence of free-standing liquids, the Contractor shall submit methods for the removal of free-standing water. The Contractor shall also submit the additional costs of the proposed alternative to the Engineer for review. No alternative methods of solidification shall be initiated until reviewed and accepted by the Engineer.

Method of Measurement:

This work will be measured for payment as the actual weight of solidification material used by the Contractor. The Contractor shall demonstrate the amount of solidification material used by the original weight tickets from a certified scale. The weight tickets shall show the weight of the material brought to the site and subsequently used in solidification operations.

If no certified scale is available, the Engineer may allow for the calculation of the weight by a summation of sealed, pre-measured bags.

Basis of Payment:

This work will be paid for at the Contract unit price for solidification material used and accepted by the Engineer. Such price shall include all labor, materials, tools, and equipment incidental to the work including transportation of the materials to the Project and the addition of solidification material to excavated materials.

Pay Item

Pay Unit

Environmental Work - Solidification

Ton

ITEM #0202217A – SUPPLEMENTAL STREAMBED CHANNEL MATERIAL

Description: This work shall consist of procuring, transporting and placing supplemental streambed channel material meeting the visual inspection requirements herein, along stream bank/channel improvement locations as shown on the plans or denoted on the Project's permit applications. This work shall also include any necessary temporary protection and stockpiling of the supplemental streambed channel material on the Site and removal and proper disposal of all unused material.

Materials: Since existing streambed channel material within the project limits cannot be reused, the Contractor shall furnish visually inspected and accepted supplemental streambed channel material from an off-Site source.

The supplemental streambed channel material for this item shall be consistent with the existing naturally-formed cobbles and rocks, gravel, and clean natural sediments found within the existing channel. Rock excavated from ledge (bedrock) formations, broken from larger boulders, broken concrete or angular material will not be accepted. Rock larger than 12 inches in diameter will not be accepted. Silts and clays will not be accepted.

The visual inspection of the supplemental streambed channel material shall be performed by the Engineer at the off-Site source prior to delivery of material to the Site. The Contractor shall notify the Engineer at least 10 days in advance of the need for inspection of proposed off-Site material.

Construction Methods: At the start of construction, the Contractor shall prepare an area, approved by the Engineer, suitable in size and location for stockpiling the supplemental streambed channel bottom material. The Contractor shall select an upland location where disruption to the stream channel or impact to wetland areas caused by moving the supplemental streambed channel bottom material to and from the stockpile are minimized during the placement of material. The stockpile shall be located where it can remain undisturbed for the duration of the stream channel construction and shall be protected using sedimentation control measures.

The stockpile area shall be cleared and cleaned adequately to prevent mixing with underlying soil or other materials, including the use of structural fabric if required. The stockpile area shall be adequately covered to protect the supplemental streambed channel material from erosion by rain or other forces. After the supplemental streambed channel material has been placed in the stockpile area, no other excavated or off-Site material shall be placed in the stockpile.

The supplemental streambed channel material shall be placed at the designated location(s) to the required thickness as shown on the plans or denoted on the permit application, or as directed by the Engineer. Equipment and placement techniques shall prevent integration with the surrounding material and shall keep the channel bottom material relatively homogenous. Supplemental streambed channel material shall be placed in a manner that replicates the original condition of the channel prior to excavation.

The Contractor shall perform all containment, diversion, or other separation of the channel flow when placing the supplemental streambed channel material to minimize sediment transport downstream.

The disposal of any surplus or unsuitable material shall be in accordance with Section 2.02. Restore the stockpile area as directed by the Engineer.

Method of Measurement: Work under this item shall be measured for payment as provided under Article 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: This work will be paid for under Article 1.09.04 – Extra and Cost Plus Work.

Payment for clearing and grubbing of the approved stockpile area will be included in the item “Clearing and Grubbing.”

Payment for excavation of existing channel bottom material will be included in the item “Structure Excavation – Earth (Excluding Cofferdam and Dewatering).” Payment for disposal of excavated existing channel bottom material will be included in the item “Disposal of Sediments.”

Payment for all containment, diversion or other separation of stream flow from the excavation of channel bottom material will be included in the item “Cofferdam and Dewatering.”

Pay Item	Pay Unit
Supplemental Streambed Channel Material	est.

ITEM #0202593A – ACCESS ROAD (SITE NO. 1)**ITEM #0202594A – ACCESS ROAD (SITE NO. 2)**

Description: Work under this item shall consist of constructing temporary construction access to the areas around Bridge Nos. 01218 and 04180 at the location(s) shown on the plans for the purpose of demolishing and constructing the bridges as shown on the plans. The work involved in removing, reconfiguring, or adjusting any temporary construction access and restoring the area to its original condition shall be included as part of this item. Excavated earth from within these areas must remain on state property until reused to restore area.

Materials: A variety of materials will be necessary to construct the temporary access roads; including processed aggregate, geotextile, temporary earth retaining systems, anti-tracking pads, metal beam guiderail and associated infrastructure, three wood rail fence, single swing gate, and temporary drainage infrastructure, as shown on the plans. The preparation for the temporary access road, as well as the removal and restoration, will include the sedimentation control systems, tree protection, furnishing and placing top soil, and turf establishment.

The materials shall be as noted on the plans and shall meet the requirements of pertinent Form 817 specifications or shall be of a quality acceptable to the Engineer.

Geotextile Fabric:

Geotextile Fabric shall be a fabric that is on the “Qualified Product List for Connecticut Department of Transportation” and listed under Separation, category high survival.

Impact Attenuation Systems:

The impact attenuation system shall be selected from the Department’s Qualified Products List for Impact Attenuation Systems (Tangential) for the compatible guiderail type. All posts shall be steel except when wood posts are required by the manufacturer. Type III reflective sheeting shall meet the requirements of Section M.18.09. The impact attenuator system shall be installed as shown on the plans and in accordance with the manufacturer’s requirements. Reflective sheeting shall be installed on the nose of the impact attenuator system.

Construction Methods: The Contractor shall prepare the site using the sediment and erosion control measures as shown on the plans. This work shall include the installation, maintenance, and removal of the controls as deemed necessary by the Engineer.

The composition of the temporary access road shall be gravel overlain over a geotextile fabric, as shown on the plans. Geotextile fabric shall be used for the separation of dissimilar materials. The placement of the geotextile fabric shall conform to the manufacturer’s recommendations.

The Contractor shall maintain a maximum of 2:1 slopes and ensure that slopes greater than or equal to this are stabilized using stone slope protection, erosion control matting, or temporary earth retaining systems, as shown on the plans or at the direction of the Engineer. Alternative

TERS, such as soil nail walls or soldier-pile and lagging walls, should be considered based on subsurface conditions and project constraints. The Contractor shall be responsible for selection and final design of temporary earth retaining systems used as part of this item. This item shall also include anti-tracking pads at all egress locations as shown and detailed on the plans. There may be other locations on the project where anti-tracking pads shall be needed and shall be paid for by the square yard.

The Contractor shall remove any existing metal beam guide rail that impedes access to the temporary access road. The removed section shall be reconstructed as shown on the plans and includes a tangential impact attenuator system.

Excavated earth from within this area is not classified as clean, therefore it must remain on state property until it is restored upon completion of the project. The temporary stockpile area or another area approved by the Engineer shall be used for storage of all excavated earth pertaining to the access roads.

Clearing and grubbing and tree trimming will be required for the temporary access road. Any tree shown to be within the cut/fill limits of each site are to be removed under the direction of the Engineer.

After the temporary access road is no longer required, all materials used for its construction shall be completely removed except as noted on the plans to remain. Disturbed areas beneath and around the temporary construction access shall be restored to their original grade and condition as depicted on the plans.

Submittals:

Working drawings showing the layout of the proposed access road, including but not limited to all temporary support of excavations, tie in points to existing alignments, and locations of traffic protection devices, shall be submitted to the Engineer no later than 21 days prior to the start of work.

Method of Measurement: This work, being paid on a lump sum basis, shall not be measured for payment.

Basis of Payment: This work will be paid for at the contract Lump Sum price for “Temporary Access Road (Site No. X)”, which price shall include all work defined herein and necessary for the planning, design, construction, maintenance, removal and restoration of the temporary construction access roads and all materials, equipment, tools and labor incidental thereto.

PAY ITEM	PAY UNIT
Access Road (Site No. 1)	L.S.
Access Road (Site No. 2)	L.S.

ITEM #0203202A – STRUCTURE EXCAVATION-EARTH (EXCLUDING COFFERDAM AND DEWATERING)

Section 2.03 Structure Excavation shall be revised as follows:

Article 2.03.01 – Description: Delete in its entirety and replace with:

The work under this item include shall include the removal of all material of whatever nature, other than water, at Site No. 1 (Bridge No. 04180) Pier No. 3, that is necessary for the construction of a concrete collar around the pier wall base as shown on the plans.

The construction of a cofferdam and dewatering, the placing of natural streambed material in the excavated area remaining after the collar is built and disposal of excavated material are included under separate pay items.

Article 2.03.03 – Construction Methods: Delete in its entirety and replace with:

1. **Dimensions and Elevations of Footings:** The dimensions to the top of existing step footing and bottom of existing footing elevation as shown on the plans shall be considered as approximate only. When removing material on top of the footings, special care shall be taken not to damage the existing footings and pier wall. Any damage to the existing footings or pier wall shall be repaired at the Contractor's expense.
2. **Inspection:** After the excavation is complete, the Contractor shall notify the Engineer and no further construction shall commence until the Engineer has approved the extents of the excavation and the condition of the existing pier elements.
3. **Cleaning:** The existing concrete surfaces of pier elements shall be cleaned of all adhered soil, mud and sediment by a method acceptable to the Engineer and to condition so as not to affect the bond between the existing concrete and new concrete.
4. **Fill Adjacent to Structures:** No fill shall be placed against any structure until the Engineer has given permission to do so and in no case until after the forms have been removed.

Article 2.03.04 - Method of Measurement: Delete the last paragraph regarding horizontal payment limits and replace with the following:

Horizontal payment limits for "Structure Excavation-Earth (Excluding Cofferdam and Dewatering)" will be measured between the interior faces of the cofferdam and the existing pier elements. When the cofferdam uses steel sheet piles or other corrugated elements, the horizontal centerline of the corrugations, at the interior face, shall be used. The horizontal dimensions of the cofferdam shall not exceed those shown on the plans without the written approval of the Engineer.

Article 2.03.05 - Basis of Payment: Delete Subarticles 2.03.05 (a) and 2.03.05 (b) and replace with the following:

“Structure Excavation – Earth (Excluding Cofferdam and Dewatering),” which price shall include all materials, tools, equipment and labor necessary to complete the excavations and clean the existing concrete surfaces in accordance with the requirements of the plans or as ordered by the Engineer.

Payment for the design and construction of a cofferdam and the dewatering within the cofferdam will be included under the contract item “Cofferdam and Dewatering.”

Payment for placement of natural streambed material to backfill the remaining excavated area will be included under the contract item “Supplemental Streambed Channel Material.”

Payment for disposal of excavated existing channel bottom material will be included in the item “Disposal of Sediments.”

Pay Item	Pay Unit
Structure Excavation – Earth (Excluding Cofferdam and Dewatering)	c.y.

ITEM #0210016A — WATER QUALITY SWALE

Description: Work under this Item shall consist of channel excavation, furnishing and placing topsoil, turf establishment, trench excavation, placing permeable soil, filter fabric, placing 3/8" crushed stone, placing check dams, installing underdrain and underdrain outlets to the depths and within the area(s) shown on the plans.

Materials:

Topsoil: Topsoil shall conform to the requirements of Section M.13.01-1.

Turf Establishment: Turf establishment shall conform to the requirements of Article 9.50.02.s.

3/8" Crushed Stone: Crushed stone shall conform to the requirements of Subarticle M.08.03. This material shall conform to the gradation requirements for size No. 8 under Section M.01.01.

Filter Fabric: Filter fabric shall conform to the requirements of Subarticle M.08.01-19 for a subsurface drainage geotextile - Class A application.

Permeable Soil: Permeable soil shall be a uniform mixture of 70-85% sand, 10-20% silt and 0-10% clay. The contractor shall provide a Certified Test Report in accordance with Article 1.06.07 from a soil testing laboratory that compares the soil mix to this specification.

Underdrain: Underdrain and underdrain outlets shall conform to the requirements of Article M.08.01.

Construction Methods:

Water quality swales shall be constructed to the dimensions and grades as shown on the plans.

Topsoil: Topsoil shall be installed per Article 9.44.03.

Turf Establishment: Turf establishment shall be installed per Article 9.50.03.

Filter Fabric: Filter fabric shall be installed per Article 7.55.03.

Permeable Soil: Permeable soil shall be placed in lifts not to exceed 15 inches in depth, with each layer compacted before the addition of the next layer. The required depth to which permeable soil is to be placed is to be the depth as shown on the plans after compaction and settlement of the material has taken place.

Underdrain: Underdrain shall be installed per Article 07.51.03. Underdrain shall be placed with the perforations at the bottom of the pipe and placed on a 3 inch bed of 3/8 inch crushed stone that has been tamped true to grade. After the pipe has been installed, 3/8 inch crushed stone shall be placed carefully around and over the pipe to a height of 6 inches above the top of the pipe and wrapped in filter fabric.

ITEM #0210016A

Method of Measurement:

This work shall be measured for payment by the number of cubic yards of water quality swales installed and accepted in place in accordance with the plans or as ordered by the Engineer.

Basis of Payment:

Payment for the work will be made at the contract unit price per cubic yard for “Water Quality Swale” which price shall include channel excavation, turf establishment, topsoil, 3/8 inch crushed stone, check dams, filter fabric, permeable soil, underdrain, outlets for underdrain, trench excavation and grading required for water quality swale installation, and all materials, equipment, tools, labor and work incidental thereto.

Pay Item

Water Quality Swale

Pay Unit

c.y.

ITEM #0219011A–SEDIMENT CONTROL AT CATCH BASIN

Description: This work shall consist of furnishing, installing, cleaning, maintaining, replacing, and removing sedimentation control at catch basins at the locations and as shown on plans and as directed by the engineer.

Materials:

Sack shall be manufactured from a specially designed woven polypropylene geotextile sewn by a double needle machine, using a high strength nylon thread. Sack shall be manufactured by one of the following or an approved equal:

Siltsack®

SI Geosolutions: www.sigeosolutions.com
(800)621-0444

DandySack™

Dandy Products Inc.
P.O. Box 1980
Westerville, Ohio 43086
Phone: 800-591-2284
Fax: 740-881-2791
Email: dlc@dandyproducts.com
Website: www.dandyproducts.com

FLeXstormInletFilters

Inlet & Pipe Protection
24137 W. 111th St - Unit A
Naperville, IL 60564
Telephone: (866) 287-8655
Fax: (630) 355-3477

The sack shall be manufactured to fit the opening of the catch basin or drop inlet. Sack shall have the following features: two dump straps attached at the bottom to facilitate the emptying of sack and lifting loops as an integral part of the system to be used to lift sack from the basin. The sack shall have a restraint cord approximately halfway up the sack to keep the sides away from the catch basin walls, this cord is also a visual means of indicating when the sack should be emptied.

ConstructionMethods:

Sedimentation Control System at Catch Basin shall be installed by the Contractor at locations shown on the plans or as directed by the Engineer in accordance with the applicable sections of Section 2.19 of the Standard Specifications and the details in the plans. Once the restraint cord is covered with sediment, the sack shall be emptied, properly disposed of by the Contractor, cleaned and placed back into the basin. Installation, maintenance and removal shall be per manufacturer instructions and recommendations.

Method of Measurement:

Sediment Control at Catch Basin will be measured as each installed, maintained, accepted, and removed. There will be no separate measurement for maintenance or replacement due to failure of the sack or its components (holes in the sack, broken straps/loops or restraint cord) associated with this item.

Basis of Payment

Payment for this work will be made at the Contract unit price per each “Sediment Control at Catch Basin” complete in place and accepted, which price shall include all materials, equipment, tools and labor incidental to installation, maintenance throughout construction, replacement, removal and proper disposal of the sediment control material and surplus material.

Pay Item

Sediment Control at Catch Basin

Pay Unit

Each

ITEM #0406275A - FINE MILLING OF BITUMINOUS CONCRETE (0 TO 4 INCHES)

Description: This work shall consist of the milling, removal, and disposal of existing bituminous concrete pavement.

Construction Methods: The Contractor shall remove the bituminous concrete material using means acceptable to the Engineer. The pavement surface shall be removed to the line, grade, and existing or typical cross-section shown on the plans or as directed by the Engineer.

The bituminous concrete material shall be disposed of offsite by the Contractor at an approved disposal facility unless otherwise stated in the Contract.

Any milled surface, or portion thereof, that is exposed to traffic shall be paved within five (5) calendar days unless otherwise stated in the plans or Contract.

The equipment for milling the pavement surface shall be designed and built for milling bituminous concrete pavements. It shall be self propelled with sufficient power, traction, and stability to maintain depth and slope and shall be capable of removing the existing bituminous concrete pavement.

The milling machine shall be equipped with a built-in automatic grade averaging control system that can control the longitudinal profile and the transverse cross-slope to produce the specified results. The longitudinal controls shall be capable of operating from any longitudinal grade reference, including string line, contact ski (30 feet minimum), non-contact ski (20 feet minimum), or mobile string line (30 feet minimum). The transverse controls shall have an automatic system for controlling cross-slope at a given rate. The Engineer may waive the requirement for automatic grade or slope controls where the situation warrants such action.

The machine shall be able to provide a 0 to 4 inch deep cut in one pass. The rotary drum of the machine shall use carbide or diamond tipped tools spaced not more than $\frac{5}{16}$ inch apart. The forward speed of the milling machine shall be limited to no more than 45 feet/minute. The tools on the revolving cutting drum must be continually maintained and shall be replaced as warranted to provide a uniform pavement texture.

The machine shall be equipped with an integral pickup and conveying device to immediately remove material being milled from the surface of the roadway and discharge the millings into a truck, all in one operation. The machine shall also be equipped with a means of effectively limiting the amount of dust escaping from the milling and removal operation.

When milling smaller areas or areas where it is impractical to use the above described equipment, the use of a lesser equipped milling machine may be permitted when approved by the Engineer.

Protection shall be provided around existing catch basin inlets, manholes, utility valve boxes, and any similar structures. Any damage to such structures as a result of the milling operation is the Contractor's responsibility and shall be repaired at the Contractor's expense.

To prevent the infiltration of milled material into the storm drainage system, the Contractor shall take special care to prevent the milled material from falling into the inlet openings or inlet grates. Any milled material that has fallen into inlet openings or inlet grates shall be removed at the Contractor's expense.

Surface Tolerance: The milled surface shall provide a satisfactory riding surface with a uniform textured appearance. The milled surface shall be free from gouges, longitudinal grooves and ridges, oil film, and other imperfections that are a result of defective equipment, improper use of equipment, or poor workmanship. The Contractor, under the direction of the Inspector, shall perform random spot-checks with a Contractor supplied ten-foot straightedge to verify surface tolerances at a minimum of five (5) locations per day. The variation of the top of two ridges from the testing edge of the straightedge, between any two ridge contact points, shall not exceed ¼ inch. The variation of the top of any ridge to the bottom of the groove adjacent to that ridge shall not exceed ¼ inch. Any unsatisfactory surfaces produced are the responsibility of the Contractor and shall be corrected at the Contractor's expense and to the satisfaction of the Engineer.

The depth of removal will be verified by taking measurements every 250 feet per each pass of the milling machine, or as directed by the Engineer. These depth measurements shall be used to monitor the average depth of removal.

Where a surface delamination between bituminous concrete layers or a surface delamination of bituminous concrete on Portland cement concrete causes a non-uniform texture to occur, the depth of milling shall be adjusted in small increments to a maximum of +/- ½ inch to eliminate the condition.

When removing bituminous concrete pavement entirely from an underlying Portland cement concrete pavement, all of the bituminous concrete pavement shall be removed leaving a uniform surface of Portland cement concrete, unless otherwise directed by the Engineer.

Any unsatisfactory surfaces produced by the milling operation are the Contractor's responsibility and shall be corrected at the Contractor's expense and to the satisfaction of the Engineer.

No vertical faces, transverse or longitudinal, shall be left exposed to traffic unless the requirements below are met. This shall include roadway structures (catch basins, manholes, utility valve boxes, etc.). If any vertical face is formed in an area exposed to traffic, a temporary paved transition shall be established according to the requirements shown on the plans. If the milling machine is used to form a temporary transition, the length of the temporary transition shall conform to Special Provision Section 4.06 –Bituminous Concrete, "Transitions for Roadway Surface," the requirements shown on the plans, or as directed by the Engineer. At all

permanent limits of removal, a clean vertical face shall be established by saw cutting prior to paving.

Roadway structures shall not have a vertical face of greater than one (1) inch exposed to traffic as a result of milling. All structures within the roadway that are exposed to traffic and greater than one (1) inch above the milled surface shall receive a transition meeting the following requirements:

For roadways with a posted speed limit of 35 mph or less*:

1. Round structures with a vertical face of greater than 1 inch to 2.5 inches shall be transitioned with a hard rubber tapered protection ring of the appropriate inside diameter designed specifically to protect roadway structures.
2. Round structures with a vertical face greater than 2.5 inches shall receive a transition of bituminous concrete formed at a minimum 24 to 1 (24:1) taper in all directions.
3. All rectangular structures with a vertical face greater than 1 inch shall receive a transition of bituminous concrete formed at a minimum 24 to 1 (24:1) taper in all directions.

*Bituminous concrete tapers at a minimum 24 to 1 (24:1) taper in all directions may be substituted for the protection rings if approved by the Engineer.

For roadways with a posted speed limit of 40, 45 or 50 mph:

1. All structures shall receive a transition of bituminous concrete formed at a minimum 36 to 1 (36:1) taper in the direction of travel. Direction of travel includes both the leading and trailing side of a structure. The minimum taper shall be 24 to 1 (24:1) in all other directions.

For roadways with a posted speed limit of greater than 50 mph:

1. All structures shall receive a transition of bituminous concrete formed at a minimum 60 to 1 (60:1) taper in the direction of travel. Direction of travel includes both the leading and trailing side of a structure. The minimum taper shall be 24 to 1 (24:1) in all other directions.

All roadway structure edges and bituminous concrete tapers shall be clearly marked with fluorescent paint. The paint shall be maintained throughout the exposure to traffic.

The milling operation shall proceed in accordance with the requirements of the "Maintenance and Protection of Traffic" and "Prosecution and Progress" specifications, or other Contract requirements. The more stringent specification shall apply.

Prior to opening an area which has been milled to traffic, the pavement shall be thoroughly swept with a sweeper truck. The sweeper truck shall be equipped with a water tank and be capable of removing the millings and loose debris from the surface. The sweeper truck shall operate at a forward speed that allows for the maximum pickup of millings from the roadway surface. Other

sweeping equipment may be provided in lieu of the sweeper truck where acceptable by the Engineer.

Any milled area that will not be exposed to live traffic for a minimum of 48 hours prior to paving shall require a vacuum sweeper truck in addition to, or in lieu of, mechanical sweeping. The vacuum sweeper truck shall have sufficient power and capacity to completely remove all millings from the roadway surface including any fine particles within the texture of the milled surface. Vacuum sweeper truck hose attachments shall be used to clean around pavement structures or areas that cannot be reached effectively by the main vacuum. Compressed air may be used in lieu of vacuum attachments if approved by the Engineer.

Method of Measurement: This work will be measured for payment by the number of square yards of area from which the milling of asphalt has been completed and the work accepted. No area deductions will be made for minor unmilled areas such as catch basin inlets, manholes, utility boxes and any similar structures.

Basis of Payment: This work will be paid for at the Contract unit price per square yard for “Fine Milling of Bituminous Concrete (0 to 4 Inches).” This price shall include all equipment, tools, labor, and materials incidental thereto.

No additional payments will be made for multiple passes with the milling machine to remove the bituminous surface.

No separate payments will be made for cleaning the pavement prior to paving; providing protection and doing handwork removal of bituminous concrete around catch basin inlets, manholes, utility valve boxes and any similar structures; repairing surface defects as a result of the Contractors negligence; providing protection to underground utilities from the vibration of the milling operation; removal of any temporary milled or paved transition; removal and disposal of millings; furnishing a sweeper truck and sweeping after milling. The costs for these items shall be included in the Contract unit price.

Pay Item	Pay Unit
Fine Milling of Bituminous Concrete (0 to 4 Inches)	S.Y.

ITEM #0406287A RUMBLE STRIPS - AUTOMATED

Description:

Work under this item shall consist of installing rumble strips on asphalt highway shoulders where shown on the plans or where directed by the Engineer, and in conformance with these specifications.

Construction Methods:

The Contractor shall pre-mark the location of the edge of the cut, and the beginning and ending points of the sections, prior to the installation of the rumble strips. The Engineer shall review and approve the locations.

The Contractor shall arrange for a technical representative, from the company which produces the milling machine to be used on the project, who will be required to be on-site from the beginning of the operation in order to ensure results that meet the requirements of the plans and specifications until such time the Engineer is satisfied.

Rumble strips should not be installed on bridge decks, in acceleration and deceleration lanes, at drainage structures, at loop detector sawcut locations, or in other areas identified by the Engineer.

Automated (Wide Shoulders):

The equipment shall be able to install the rumble strips in sections where the shoulder width from the edge line to an obstruction is greater than or equal to 4 feet. Where there are no obstructions, the equipment shall be used in sections where the shoulder width from the edge line is a minimum of 3 feet. The equipment shall consist of a rotary type cutting head with a maximum outside diameter of 24" and shall be a minimum of 16" long. The cutting head(s) shall have the cutting tips arranged in such a pattern as to provide a relatively smooth cut (approximately 1/16 of an inch between peaks and valleys) in one pass. The cutting head shall be on its own independent suspension from that of the power unit to allow the tool to self align with the slope of the shoulder or any irregularities in the shoulder surface. The equipment shall include suitable provisions for the application of water to prevent dusting. The Contractor shall use a machine capable of creating the finished pattern at a minimum output of 60 rumble strips per minute.

Finished Cut (Automated or Manual)

The rumble strips shall have finished dimensions of 7" (+/- 1/2") wide in the direction of travel and shall be a 16" (+/- 1/2") long measured perpendicular to the direction of travel. The depressions shall have a concave circular shape with a minimum 1/2" depth at center (maximum allowable depth is 5/8" measured to a valley). The rumble strips shall be placed in relation to the roadway according to the patterns shown in the plans or on the Rumble Strip Details. Alignment of the edge of the cut shall be checked and verified by the Engineer.

The cutting tool shall be equipped with guides to provide consistent alignment of each cut in relation to the roadway.

The Contractor shall pick up any waste material resulting from the operation in a manner acceptable to the Engineer. This waste material shall be disposed of in accordance with Subarticle 2.02.03-10(a).

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

The Contractor shall provide all traffic control according to the Maintenance and Protection of Traffic Specification included elsewhere in the contract.

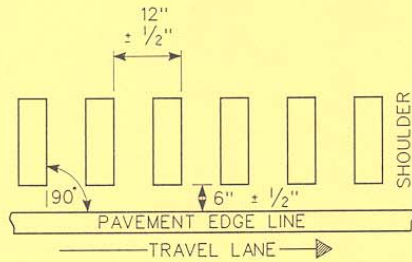
Method of Measurement:

This work will be measured for payment by the actual number of feet of shoulder where the rumble strips are placed and accepted. This distance shall be measured longitudinally along the edge of pavement with deductions for bridge decks, acceleration and deceleration lanes, drainage structures, loop detector sawcut locations, and other sections where the rumble strips were not installed.

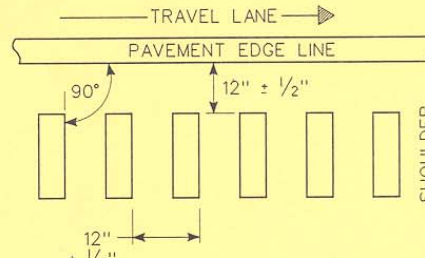
Basis of Payment:

This work will be paid for at the Contract unit price per foot for "Rumble Strips - Automated" or "Rumble Strips - Manual." The price shall include furnishing all equipment, tools, labor, a technical representative and work incidental thereto and also disposal of any waste material resulting from the operation. The Contractor will not be paid under the item "Rumble Strips - Manual" if the field conditions allow for the use of the "Rumble Strips - Automated" item, even if the manual method was used.

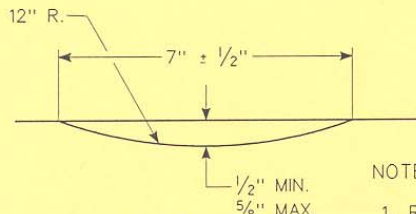
DETAILS AND SECTIONS OF RUMBLE STRIPS



LOCATION DETAIL (TYP.)
LEFT SHOULDER



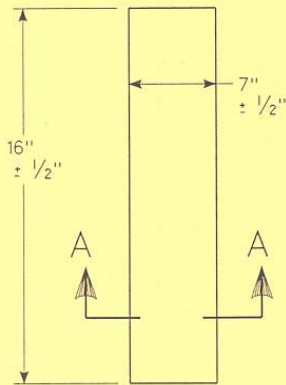
LOCATION DETAIL (TYP.)
RIGHT SHOULDER



SECTION A-A
NO SCALE

NOTES:

1. RUMBLE STRIP ALIGNMENT SHALL GENERALLY BE STRAIGHT AND OFFSET APPROXIMATELY 6" IN THE LEFT SHOULDER AND 12" IN THE RIGHT SHOULDER FROM THE OUTER EDGE OF THE EDGE LINE AND SHALL BE AT LEAST 12" FROM THE LONGITUDINAL JOINT IN COMPOSITE PAVEMENTS. THIS OFFSET MAY BE ADJUSTED TO ACCOMMODATE VARIATIONS IN THE EDGE LINE AND THE SHOULDER WIDTH.



PLAN DETAIL

FILE: RUMBLE.MDS

CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUR. OF ENGINEERING & HWY. OPERATIONS
DIVISION OF TRAFFIC ENGINEERING

RUMBLE STRIP DETAILS

ENGINEER *Erika B. Smith* DATE 10-18-99

SUBMITTED *Stephen J. Masieko* DATE 10-20-99

TRANS. SUPERVISING ENGR.

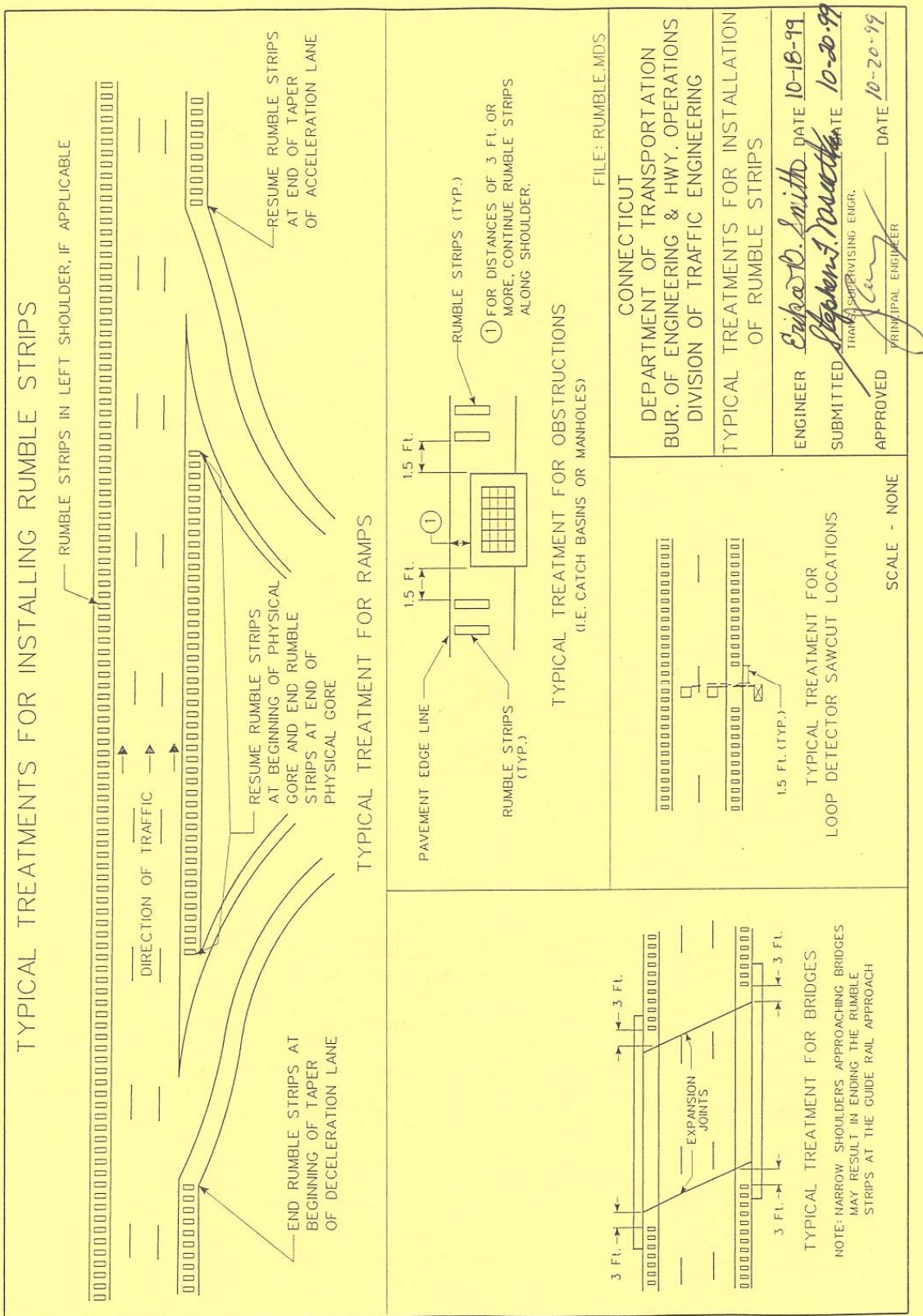
APPROVED *J. Long* DATE 10-20-99

PRINCIPAL ENGINEER

SCALE - NONE

ITEM # 0406287A

ITEM # 0406288A



ITEM # 0406287A

ITEM # 0406288A

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

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

ITEM #0406316A – 80 MIL PAVEMENT MARKING GROOVE 9” WIDE

Description:

Work under this item shall consist of grooving the pavement surface in a continuous or regularly spaced fashion 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
7 inches wide for 6-inch markings
9 inches wide for 8-inch markings

Groove Depth: 0.080 inches ± 0.010 inches

The groove shall not be installed continuously for intermittent 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.

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.

Construction Methods:

The pavement marking groove shall be installed in accordance with the current ConnDOT 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 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 epoxy resin 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, temporary 0.005-inch hot-applied waterborne pavement markings without glass beads shall be installed before the lane or roadway is opened to live traffic at no additional cost to the State. Within 10 calendar days, permanent epoxy resin pavement markings shall be applied in the groove over the 0.005-inch 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 no less than one week prior to the anticipated beginning of grooving operations. Gauges shall be accompanied by 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 groove 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 feet 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 operation.

Pay Item

80 Mil Pavement Marking Groove 5" Wide
80 Mil Pavement Marking Groove 7" Wide
80 Mil Pavement Marking Groove 9" Wide

Pay Unit

L.F.
L.F.
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 hot mix asphalt (HMA), Polymer Modified Asphalt (PMA), and Ultra-Thin Bonded Hot-Mix Asphalt mixtures completed and accepted during the Contract.

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

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

Construction Methods:

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

- I. For HMA and PMA mixtures:
 - a. The HMA or PMA mixture for which the adjustment would be applied is listed as a Contract item with a pay unit of tons.
 - b. *The total quantity for all HMA and PMA mixtures in the Contract or individual purchase order (Department of Administrative Service contract awards) exceeds 1000 tons or the Project duration is greater than 6 months.*
 - c. The difference between the posted *Asphalt Base Price* and *Asphalt Period Price* varies by more than \$5.00 per ton.
- II. For Ultra-Thin Bonded HMA mixtures:
 - a. The Ultra-Thin Bonded HMA mixture for which the adjustment would be applied is listed as a Contract item.
 - b. The total quantity for Ultra-Thin Bonded HMA mixture in the Contract exceeds:
 - i. 800 tons if the Ultra-Thin Bonded HMA item has a pay unit of tons.
 - ii. 30,000 square yards if the Ultra-Thin Bonded HMA item has a pay unit of square yards.

Note: The quantity of Ultra-Thin Bonded HMA measured in tons shall be determined from the material documentation requirements set forth in the Ultra-Thin Bonded HMA item Special Provision.
 - c. The difference between the posted *Asphalt Base Price* and *Asphalt Period Price* varies by more than \$5.00 per ton.
 - d. No Asphalt Adjustment Cost will be applied to the liquid emulsion that is specified as part of the Ultra-Thin Bonded HMA mixture system.
- III. Regardless of the binder used in all HMA or PMA mixtures, the Asphalt Adjustment Cost will be based on PG 64-22.

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

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

Method of Measurement:

Formula: $HMA \times [PG\%/100] \times [(Period\ Price - Base\ Price)] = \$ \underline{\hspace{2cm}}$

where

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

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

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

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

Pay Item	Pay Unit
Asphalt Adjustment Cost	est.

ITEM #0502185A – TEMPORARY TRESTLE (SITE NO. 1)
ITEM #0502186A – TEMPORARY TRESTLE (SITE NO. 2)

Description: Work under this item shall include the design, construction, maintenance and removal of the temporary trestles, crane mats and floating docks required for the bridge removal and reconstruction as shown on the plans or as directed by the Engineer.

The information shown on the plans pertaining to the temporary trestles and sequence of construction and erection procedures conveys assumptions made by the designer and is for information only. The Contractor shall be responsible for selecting the means and methods for construction, subject to the design and testing parameters and environmental permit restrictions. Temporary trestles may consist of clear span or cantilevered sections as required to avoid possible conflicts with existing or proposed features. The Contractor shall design and submit for approval plans, details, and computations showing temporary trestles capable of safely supporting machinery, equipment and loads necessary for the construction of the new bridge and removal of the existing bridge.

The Contractor may adjust the design details shown on the plans provided the details are in conformance with the approved permits. The temporary trestles shall have a minimum low chord elevation that is higher than the FEMA 100 year flood elevation of 108.0 feet (NAVD88). Solid walls, which will impede fish passage or the flow of water, may not be used to support the temporary trestles. The Contractor shall maintain the required temporary navigable channel as shown on the plans. Any increases to the overall footprint of the temporary trestles must be approved by the Engineer prior to construction.

Materials: All materials used in the construction of the temporary trestles shall be of a quality and nature acceptable to the Engineer. All materials shall be free of contaminants, such as lead paint, that are unacceptable for use in and around wetlands and waterways.

Construction Methods:

Submittals:

At least 60 days prior to installation, the Contractor shall submit to the Engineer for his review and approval, plans, details and computations for any temporary trestle structures, prepared, signed and sealed by a Professional Engineer licensed to practice in the State of Connecticut, in accordance with Article 1.5.02.

The design of all trestle components, including, but not limited to, the decking, floorbeams, stringers, and piles, shall be done in accordance with the latest edition, including interims, of the AASHTO Guide Design Specifications for Bridge Temporary Works.

Review, acceptance, or approval of proposed plans or methods shall not relieve the Contractor of any of his obligations to provide a safe and usable temporary trestle.

Prior to the start of work, the Contractor shall submit a proposed schedule of values for review and concurrence by the Engineer. Schedule of values shall include a breakdown of installation and removal activities for piles and superstructure components with corresponding milestones to be used for partial payments. At a minimum, 10% of the lump sum cost for the Temporary Trestles shall be assigned to the removal activities and milestones. The Schedule of Values shall be submitted to the Engineer a minimum of 21 days prior to the start of work. No partial payments shall be made until the approval of the submitted schedule of values by the Engineer.

All temporary trestle structures shall be substantially built in a workmanlike manner, using a sufficient number of piles, supporting members, decking systems, and fasteners, all of which shall be safe for performing the work and suitable for the intended purpose.

The Contractor shall also maintain the temporary trestle structures by renewing or repairing damaged structural elements.

If obstructions are encountered during the installation of piles, the contractor shall try to break up the obstruction by driving a steel H-pile with driving shoe at the location of the pile, or by an alternative method submitted to and approved by the Engineer. If the Contractor is unable to install a pile due to an obstruction, the Contractor shall install the pile at a relocated location, revise the trestle design and submit revised trestle design calculations at no additional cost to the State.

Upon completion of construction operations associated with the use of the temporary trestles, the Contractor shall remove and properly dispose of any temporary trestle structures, including all piles. During removal of the temporary works, the Contractor shall not disturb or damage any permanent construction. If any piles cannot be removed, the piles shall be cut down 2 feet below the mudline. No additional material shall be used to backfill pile holes or to cover cut off piles.

Maintenance: The Contractor shall take all means necessary to maintain water passage beneath the temporary trestle platforms, which may necessitate removal of debris or ice damming against elements of the trestles.

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

Basis of Payment: This work will be paid for at the contract Lump Sum price for “Temporary Trestle (Site No. X)”, which price shall include all work defined herein and necessary for the planning, design, construction, maintenance, and removal of the temporary trestles, crane mats and floating docks and all materials, equipment, tools and labor incidental thereto. Partial payments shall be in accordance with submitted and approved schedule of values.

PAY ITEM	PAY UNIT
Temporary Trestle (Site No. 1)	L.S.
Temporary Trestle (Site No. 2)	L.S.

ITEM #0502185A
ITEM #0502186A

Rev. 11/15/2019

ITEM #0503001A - REMOVAL OF SUPERSTRUCTURE

Work under this item shall conform to the requirements of Section 5.03 amended as follows:

5.03.01 - Description: *Replace this article with the following:*

Work under this item shall consist of the removal and satisfactory disposal of the superstructure. Those items to be removed and disposed of shall include, steel beams, diaphragms, concrete deck, curbs, parapets, bituminous wearing surface, metal bridge rail, fences, bearings and bridge mounted sign structures, and coatings found on any of these items as shown on the plans or as directed by the Engineer. Design, installation and removal of temporary supports/bracing required to stabilize the existing steel superstructure during staged demolition is also included under this item. The temporary protective shield design, materials, installation and removal shall be included in this item.

The removal and disposal of any paint debris shall be included in the item “Lead Compliance for Miscellaneous Exterior Tasks”.

5.03.03 - Construction Methods: Add the following:

1. Removal of Superstructure:
 - a. The Contactor shall submit to the Engineer for review in accordance with Article 1.05.02, his proposed demolition sequence together with working drawings, and calculations showing the governing stresses for removal of steel girders during the various sequence steps. Proper temporary vertical and horizontal girder supports/bracings shall be designed and provided, as necessary, to suit the Contractor’s sequence of staged demolition. Acceptance of the Contractor’s plans shall not be considered as relieving the Contractor of any responsibility.
 - b. All plans and calculations to be signed and sealed by a Professional Engineer licensed to practice in the State of Connecticut.
 - c. A “Superstructure Demolition Sequence” is shown on drawings. The Contractor may propose an alternate sequence, to be approved by the Engineer. The alternate sequence is to conform to all requirements described in drawings, specifications and special provisions.
 - d. Before beginning removal of concrete and structural steel in all spans, the Contractor must have received approval of his proposed method of superstructure demolition and temporary protective shield designs and supports/bracings, and must have installed the temporary protective shield and supports/bracings. The extent and limits of protective shield is to prevent all construction debris, material, tools, equipment or any other waste from entering into all areas below the bridge deck.

- e. All material shall become the property of the Contractor and shall be removed and disposed of off-site by him. The Contractor is responsible for any fees and permits necessary to dispose of all materials removed as part of this item. The Contractor is responsible for the cost and securing of all permits that may be required to transport all material removed under this item to the disposal site.
- f. The superstructure removal shall not result in damage to any permanent construction (new or existing) or to adjoining property. If any damage does occur, it shall be repaired by the Contractor to the satisfaction of the Engineer at no additional expense to the State.
- g. Removal of coatings including possible lead containing paint shall be abated in compliance with Item #0020903A – Lead Compliance for Miscellaneous Exterior Tasks.

5.03.04 - Method of Measurement: Delete the entire article and replace with the following:

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

5.03.05 - Basis of Payment: Delete the second and third paragraphs and replace with the following:

This work will be paid for at the contract lump sum price for “Removal of Superstructure” which price shall include the removal and disposal of the superstructure components, the design, materials, installation, and removal of the temporary supports/bracing and protective shielding, and all equipment, tools and labor incidental thereto.

The containment, removal, collection, storage and disposal of paint debris (hazardous and non-hazardous) will be paid for under the item “Lead Compliance for Miscellaneous Exterior Tasks”.

<u>Pay Item</u>	<u>Pay Unit</u>
Removal of Superstructure	L.S

ITEM #0507568A – TEMPORARY STEEL PLATE

Work under this item shall conform to the requirements of Section 5.07, amended as follows:

Description: Add the following:

Catch basins shall have tops removed and shall be covered with steel plates during construction staging where shown on the contract plans or as ordered by the Engineer.

Materials: Add the following:

Steel plate shall conform to ASTM A 709, Grade 36.

Construction Methods: Add the following:

Where catch basins are shown on the plans to be covered during construction staging, the Contractor shall remove the existing (or new) catch basin top, and place a minimum 1-1/4" thick steel plate over the opening, prior to the placement of temporary pavement. The plate shall bear on the catch basin walls a minimum of 8" around the entire perimeter of the opening.

The plate shall be removed and disposed of by the Contractor when the construction staging allows for the placement of the permanent catch basin top.

Method of Measurement: Add the following:

The quantity to be paid for under this item shall be the number of temporary steel plates installed and accepted where shown on the plans or as ordered by the Engineer.

Basis of Payment: Add the following:

The installation of temporary steel plates on catch basins shall be paid for at the contract unit price each for "TEMPORARY STEEL PLATE" which price shall include all materials, equipment, tools and labor incidental thereto. No additional payment shall be made for installation of the permanent catch basin top.

ITEM #0507598A – TRASH RACK

Description: Work under this item shall consist of furnishing and installing trash racks at specified locations and as directed by the Engineer. Trash racks shall be of the style depicted in the Contract plans and be capable of intercepting small-sized floating debris (small limbs and sticks) at the intake structure. Trash racks should be of such a design that debris is caught when the Water Quality Basin fills up to the rack, and most of the debris will dislodge when the basin starts to empty out. This item shall also include all hardware and work needed to complete this item. Trash racks will be required in the following location:

Intake Structure for Water Quality Basin No. 1

- Intake Structure top (pyramid or round), and

Materials: All material shall conform to the following:

1. Trash racks shall be made of structural plastic, chosen from one of the following manufacturers:

Trashracks.com - a division of J.R. Hoe https://trashracks.com/ 101 Ironwood Road Middlesboro, KY 40965 (800) 245-5521	Eastern Supply Inc. PO Box 1445 Winchester, VA 22604 (800) 522-3292 www.easternsupply.com
StormRax PO Box 4386 Winchester, VA 22604 (800) 722-2219 www.plastic-solution.com	or an approved equal

The trash racks shall conform to the following:

- Load tested to minimum 1000 lbs./sf.
- Ultra violet light resistant per ASTM D2565-99.
- The trash rack mounted on the top of the outlet structure shall be sized for proper mounting to the top of the intake structures detailed in the Contract plans.
- The trash rack mounted to the front of the outlet structure shall be sized to sufficiently cover the front outlet holes to minimum dimensions detailed in the Contract plans.

2. Mounting hardware shall be corrosion resistant and of a design and material satisfactory for the purpose intended, recommended by the manufacturer, and as approved by the Engineer.

Construction Methods: Trash Racks shall be designed and installed for safety and proper performance.

Shop Drawings for Trash Racks shall be submitted in accordance with the requirements of Article 1.05.02-3. The furnishing of such plans shall not relieve the Contractor of any part of his responsibility for the safety of the work or the successful completion of same. Trash Rack design shall be performed as outlined in the U.S. Department of Commerce Bureau of Public Roads, Hydraulic Engineering Circular (HEC-9) for light size floating debris.

Trash Racks shall be mounted to the concrete intake structure riser so as to have no significant gaps and shall fit properly and securely, to the satisfaction of the Engineer.

Method of Measurement: This item will be measured by the actual number of intake structures equipped with Trash Racks for top and front intake openings, completed and accepted.

Basis of Payment: This work will be paid for at the contract unit price per each for “Trash Rack” of the type and size for the Intake Structures specified on the plans, complete in place, which price shall include all materials, mounting bolts, anchoring hardware or material, and all equipment, tools and labor incidental thereto.

Pay Item
Trash Rack

Pay Unit
EA

ITEM #0507598A

ITEM #0511031A – BRIDGE SCUPPER – TYPE A

ITEM #0511032A – BRIDGE SCUPPER – TYPE B

Description:

This work shall consist of furnishing and installing scuppers, hoppers and grates, and fiberglass downspout systems for bridge drainage as shown on the plans.

Materials:

Steel for the scupper frames, grates, and miscellaneous attachment materials including plates and angle irons shall conform to ASTM A709 or stronger, shall be hot dip galvanized in accordance with ASTM A153 and shall be manufactured in accordance with the plans. The lock down bolts shall be stainless steel conforming to AISI Type 304. Studs shall conform to the requirements of M.06.02-4. U-Bolts and nuts shall conform to ASTM A276 Type 304. The caulking shall be silicone sealant conforming to ASTM C920 Type S, Grade NS, Class 40 or Federal Specifications TT-S-001543A (COM-NBS) Class A and TT-S-00230C (COM-NBS) Class A.

Bolts for attaching plates to existing girder/beam webs shall conform to ASTM F3125 Grade A325 and shall be hot dip galvanized in accordance with ASTM A153.

The hoppers shall be custom molded reinforced polyester chemical-resistant fiberglass as shown on the plans.

The resin shall be corrosion resistant and shall be evaluated as a laminate by test or previous service to be acceptable for the environment. The resins used shall not contain fillers except as required for viscosity control or fire retardance. Up to 5% by weight of the isotropic agent, which will not interfere with visual inspection, may be added to the resin for viscosity control. Resin may contain pigments and dyes if authorization for their use is obtained from the Department. Antimony compounds or other fire retardant agents shall be added as required for improved fire resistance. The resin shall be protected by an ultra-violet absorbing system consistent with good practice.

The reinforcing material shall be a commercial grade of glass fiber having a coupling agent which will provide a suitable bond between the glass reinforcement and the resin. The glass and resin shall be applied in proper quantities to achieve maximum strength. However, the glass fiber shall be not less than 25% by weight. The laminate shall have a minimum ultimate tensile strength of 12 ksi, a minimum flexural strength of 20 ksi, and a minimum tangent flexural modulus of elasticity of 800 ksi. The material used as reinforcing on the surface exposed to chemical attack shall be a commercial grade chemical resistant glass having a coupling agent.

The laminate shall consist of an inner surface, an interior layer, and an exterior layer or laminate body. The composition of the inner surface and interior layer are intended to achieve optimum chemical resistance. The inner surface shall be free of cracks and crazing with a smooth finish and with an average of not over 2 pits per square foot, providing the pits are less than 1/8" diameter and not over .04" deep and are covered with sufficient resin to avoid exposure of inner surface fabric. Some waviness is permissible as long as the surface is smooth and free of pits. Between .01" and .02" of reinforced resin-rich surface shall be provided. This surface shall be reinforced with one ply of glass reinforcing matt.

The laminate shall be built to finished thickness in stages to minimize warping.

The laminate shall come to room temperature before successive plies are built up.

Barcol hardness, within 24 hours, shall be not less than the manufacturer recommends, when tested in accordance with ASTM D2583.

The color of the exterior surfaces of the hopper and the drain pipes shall match the top coat color of the steel or as ordered by the Engineer. The Contractor shall submit a color sample to the Engineer for approval. A U.V. inhibitor shall be incorporated in the epoxy resin.

The Contractor shall furnish Certified Test Reports and Materials Certificates for each batch in conformance with the requirements set forth in Article 1.06.07.

Studs shall be welded to the frames in accordance with Article 5.08.03.

Steel frames and grates shall be hot-dip galvanized after fabrication in accordance with Article M.06.03.

Shop drawings for the frames and grates shall be submitted in accordance with Article 1.05.02.

All manufacturing practices shall conform to Society of the Plastic Industries (SPI) standards.

Fiberglass pipe and fittings shall be reinforced thermosetting resin pipe (RTRP) systems meeting the requirements of ASTM Specification D2996. They shall qualify for a 30 ksi minimum short time rupture strength hoops tensile stress.

The exterior of fiberglass pipe and fittings shall have an ultraviolet stabilized resin coating of the color noted in the Contract Documents. If no color is noted, use sage green. Paint will not be accepted.

A. Downspouts:

1. Pipe: Pipe shall be (reinforced thermosetting resin fiberglass pipe) meeting the requirements of ASTM Standard D2996, D3982, D3840 and NBS PS 15-69.
2. Pipe Fittings: Pipe fittings (e.g. elbows, tees, couplings, etc.) shall be reinforced thermosetting resin fiberglass pipe meeting the requirements of ASTM Standard D2996, D3982, D3840 and NBS PS 15-69.
3. Adhesive: The adhesive used for joining the fiberglass pipes and pipe fittings shall meet the requirements of ASTM D5677.

B. Pipe Brackets and Supports:

Pipe brackets and supports shall conform to the requirements of ASTM A575, Grade 1015 or 1020.

Anchors shall meet or exceed the requirement of U.S. Government, G.S.A. Specifications No. AA 1922A.

Nuts and bolts shall conform to the requirements of ASTM F568 Class 4.6. Nuts and bolts shall be galvanized in accordance with Subsection 719-01, Type II.

Bolts and cap screws shall conform to the requirements of ASTM F568, Class 4.6.

C. Neoprene Coupler:

Neoprene couplers shall conform to the requirements of ASTM Specification C564 or equal.

Construction Details:

A. Shop Drawings:

1. A plan and elevation with details showing all lengths, fittings, support and material designation needed to fabricate the scupper.
2. Commercial items shall be identified by manufacturer, trade name and catalog number and shall indicate sufficient details.
3. The installation of welded studs shall also be shown in accordance with the requirements of Article 5.08.03.

B. Erection of Downspout Systems:

Connections for runs of pipe noted on the plans as removable for maintenance shall be made with a bolted gasketed flange system or neoprene couplers. All clean outs shall be made with a female - male threaded plug. Adhesive bonded joints will be permitted for runs of pipe between such connections.

A socket joint made for joining two pieces of pipe or fittings together requires the following steps:

1. The plain end of the Bridge Drainage Pipe (BDP) shall be sanded as to remove the resin glaze from the end of the BDP to be bonded. This can be accomplished with a power disc grinder or belt sander. Grind off enough area to exceed slightly the length of insertion into the socket itself. The strength and adhesion of the joint will be adversely affected by any grease, oil, dirt, moisture, solvents, etc., remaining on the BDP or in the interior of the socket to be bonded. After sanding the BDP, dust off the end and socket with a clean, dry cloth since grinding dust will severely weaken the bonding properties. If a sanded joint must be left for an extended period of time, the joint shall be re-sanded just prior to the joining procedure.
2. Check for ease of insertion before mixing the adhesive. If necessary, sand additional material from the plain end to allow for an easy insertion.
3. Mix the adhesive per the instructions supplied by the manufacturer.
4. Apply adhesive mix on the plain end and inside the socket. Be sure the adhesive is totally covering the plain end and the socket surfaces.
5. Insert the plain end into the socket.
6. In the larger diameter BDP it may be necessary to use extra force such as a come-a-long or other device to insert the BDP into the socket. The joint shall remain supported and motionless to the satisfaction of the Engineer, until the adhesive has cured. The curing process can be both accelerated and strengthened by applying an electric heat collar to the joint once the adhesive has reached a gelatin like consistency. Open flame shall not be used for curing. Wipe any excess adhesive from the joint and clean for a good appearance.

Runs of pipe shall be supported at spacing not greater than the lesser of those recommended by the manufacturer of the pipe or as shown on the bridge plans. Supports that have point contact or narrow supporting areas shall be avoided. Standard sling, clamp and clevis hangers for use with steel pipe may be used. Straps shall have 120 degrees of contact with the pipe. Hanger thickness shall be 3/16" (min.)

NPS	Minimum Strap Width (inch)
6	1.5
8	1.5
10	1.5
12	2

All reinforced fiberglass pipe, fittings and expansion joints shall be handled and installed in accordance with guidelines and procedures recommended by the manufacturer of the material.

1. **Pipe Installation:** The pipe shall be laid true to line and grade as shown on the plans or as directed by the Engineer, with joints close and even, so that a true and even surface of invert will be made over the joints throughout its entire length. Pipe shall be installed so that the minimum slope shall not be less than 8%. Pipe shall be placed in accordance with the requirements of this specification unless special methods are called for on the plans or in the itemized proposal.
2. **Field Testing:** Prior to the acceptance of the structure by the Department, the downspout system shall be flushed out and tested by the Contractor, to insure that it is unobstructed and does not leak. Any obstruction in the downspout system preventing the free flow of drainage shall be removed to the complete satisfaction of the Engineer.

Method of Measurement:

This work will be measured for payment by the number of completed scuppers with attached downspouts completed and accepted.

Basis of Payment:

This work shall be paid for at the contract unit price, per each, for "Bridge Scupper with Downspout" which price shall include the cost of furnishing all labor, materials and equipment necessary to erect the scupper hopper, frame, grate, pipe, fittings, and pipe supports. The unit price bid per each shall also include the cost of furnishing and placing pipe hangers and brackets, couplings.

<u>Item</u>	<u>Pay Unit</u>
Bridge Scupper – Type A	Each
Bridge Scupper – Type B	Each

ITEM #0512010A - 6" PIPE FOR BRIDGE DRAINAGE

Description:

This item shall consist of furnishing and installing the fiberglass pipe, fittings including reducers, expansion joints, wyes, cleanouts, hangers, supports, chemical anchors, inlets, slotted outlet covers, hoppers, protective shielding and appurtenances, for drainage of bridge deck to the lines and grades designated on the plans, or as directed by the Engineer. Item shall also include removal and disposal of all existing drainage pipes and associated hardware and anchorages.

Materials:

All fiberglass components of the bridge drainage piping system shall be supplied by a single manufacturer with the exception of the fiberglass junction boxes.

The fiberglass pipe shall be Reinforced Thermosetting Resin Pipe (RTRP) which shall satisfy the requirements of ASTM Specification D 2996 RTRP-I IAA-1111. The pipe shall qualify for a 10 ksi minimum short-term rupture strength hoop tensile stress.

Pipe joints shall be straight bell-and-spigot, tapered bell-and-spigot or flanged.

Fittings including wyes, cleanouts, reducers, and other types of manufactured elbows shall have a smooth interior with a minimum centerline radius of one and one half (1-1/2) times the pipe diameter. Cleanout end caps, inlets, and slotted outlet covers shall be fiberglass and shall attach to the cleanout pipe fitting using a flanged connection with a minimum of 4 bolts and a sealing gasket.

All fittings shall be static rated at 100 psi with a safety factor of three (3) times the static rating, in accordance with ASTM D1599.

The adhesive to be used for joining pipe segments shall consist of epoxy resin and a hardener curing agent having a minimum pot life of 15 minutes at 80°F which when fully cured develops the strength capacity of the pipe, in accordance with the manufacturer's recommendations.

The color of all fiberglass piping components shall be "concrete-gray". The Contractor shall submit a color sample to the Engineer for approval. A U.V. inhibitor shall be incorporated in the epoxy resin.

Pipe Supports: Structural steel for pipe support members, clamps, hangers, junction box supports, anchorage plates, and shims shall conform to the requirements of ASTM A709, Grade 50 and shall be galvanized after fabrication to meet the requirements of ASTM A 123.

Threaded rods, anchor bolts, bolts and nuts shall conform to the requirements of ASTM A449, A563-Grade DH, A 194-Grade 2H or F436 as applicable. All hardware shall be hot dip galvanized in accordance with ASTM A 153 or A 123 as applicable.

Welding required for fabrication of the pipe supports shall be in accordance with the current AWS specifications.

Anchorage System: Pipe supports shall be connected to concrete with stainless steel anchors selected from the Connecticut Department of Transportation approved products list and shall be installed per manufacturer's instructions and recommendations. Threaded concrete inserts shall be compatible with the galvanized steel threaded rods and designed to develop pullout and shear loads exceeding the required working loads of the section of pipe to be supported.

The Contractor may propose chemical anchor systems as a substitution for the concrete inserts. Anchoring systems are subject to the approval of the Engineer and shall exceed the working load requirements shown on the plans and shall be of non-corrosive materials suitable for the application. Chemical anchors and testing shall be in accordance with Section M.03.01-15 of the Standard Specifications.

Non shrink grout filler material shall be in accordance with Article M.03.05.

Neoprene pads, 1/8" thick shall be bonded to all surfaces of steel pipe supports or hangers in direct contact with the fiberglass pipe. The neoprene shall conform to the requirements of ASTM D4637, Type II, Class SR. The adhesive bonding agent for attaching the neoprene to the pipe support clamp surface shall be "Quick Gel Instant Adhesive" manufactured by Loctite Corporation, Rocky Hill, Connecticut, or an approved equal recommended by the manufacturer of the neoprene.

High Strength Bolts shall conform to the requirements of ASTM F3125 Grade A325. Threaded rods and associated nuts and washers shall be Type 304 Stainless Steel.

Hex nuts shall conform to ASTM A563, Grade DH or ASTM A 194, Grade 2H. Washers shall conform to ASTM F436.

High strength bolts including hex nuts and washers shall be mechanically galvanized in conformance with ASTM B695, Class 50.

The Contractor shall furnish a Certified Test Report and a Materials Certificate for the pipe joining adhesive, and all other fiberglass components of the piping system, in conformance with the requirements set forth in 1.06.07.

Construction Methods:

Shop Drawings: Before fabricating any materials, the Contractor shall take all field measurements necessary to assure proper fit of the finished work and shall submit shop drawings

to the Engineer for approval in accordance with Article 1.05.02-3. These drawings shall include, but not be limited to the following information:

- A. A layout plan and elevation showing all lengths, elevations, fittings, supports, cleanouts, expansion devices if required, appurtenances and material designations.
- B. Commercial items shall be identified by manufacturer, trade name and catalog number and shall indicate sufficient details.
- C. Pipe supports and hangers and all other support devices shall be fully detailed.
- D. All field measurements shall be submitted for reference.

Installation: The pipe shall be installed to the lines and grades shown on the plans and shall be securely attached to the structure.

The adhesive for joining pipes shall be mixed and applied in strict accordance with directions included in the adhesive kit, or as directed by the representatives of the manufacturer. The surfaces of the joint shall be coated with the adhesive immediately before joining adjacent lengths of pipe. After properly joining two adjacent sections, the pipe supports and clamps shall be properly tightened to hold the pipe in place.

Method of Measurement:

This work will be measured for payment by the actual number of linear feet of pipe for bridge drainage of the size specified, completed and accepted, measured in place along the axis of the pipe through all fittings from the pipe connector at the scupper pan to it terminus at or below grade.

Basis of Payment:

This work will be paid for at the contract unit price per linear foot of “6” Pipe for Bridge Drainage”, complete in place, which price shall include all materials including fiberglass pipe, pipe supports, hangers, cleanouts, inlets, slotted outlet covers, hoppers, protective shielding and supports, including hardware, all equipment, tools and labor incidental thereto.

Structural steel members and appurtenances detailed to support the pipe shall be considered incidental to the cost of the fiberglass pipe.

<u>Pay Item</u>	<u>Pay Unit</u>
6” Pipe for Bridge Drainage	If

ITEM #0513003A –1½" POLYVINYL CHLORIDE PLASTIC PIPE

ITEM #0513007A –4" POLYVINYL CHLORIDE PLASTIC PIPE

Work under this item shall conform to the requirements of Section 5.13 amended as follows:

Description: Delete and replace with the following:

This item shall consist of furnishing and installing polyvinyl chloride pipe for use as drains through the abutment and deck for weepholes as shown on the plans or as ordered by the Engineer.

Construction Methods: Installation of drain pipes shall not result in damage to the abutment reinforcement. If any damage does occur, it shall be repaired by the Contractor to the satisfaction of the Engineer at no additional expense to the State.

Method of Measurement: This work will be measured for payment by the number of linear feet of pipe installed as indicated on the plans.

Basis of Payment: This work will be paid for at the contract unit price per linear foot for 1½” Polyvinyl Chloride Plastic Pipe and 4” Polyvinyl Chloride Plastic Pipe complete and accepted, which price shall include the installation of drain pipes, repair of damaged areas surrounding drain pipes, and all equipment, tools and labor.

<u>Pay Item</u>	<u>Pay Unit</u>
1½” Polyvinyl Chloride Plastic Pipe	L.F.
4” Polyvinyl Chloride Plastic Pipe	L.F.

ITEM #0513003A
ITEM #0513007A

ITEM #0520902A - INSTALLATION OF FINGERJOINTS

Description:

Work under this item shall consist of furnishing and installing a steel finger expansion joint including steel curb, sidewalk and parapet closure assemblies, anchor studs, anchorage devices, anchor bolts, shipping devices, concrete header all in accordance with these specifications and in conformity to the lines, elevations, and locations shown on the plans. The work shall conform to the general requirements of Section 6.03 — Structural Steel and Section 6.01 Concrete for Structures.

Materials:

Structural steel shapes and plates shall conform to the requirements of ASTM A709 Grade 50. The complete assembly shall be galvanized after fabrication in conformance with the requirements of ASTM A123.

Anchor bolts shall conform to ASTM F1554 Grade 36. Anchor bolt nuts shall conform to ASTM F563.

Anchor bolts, nuts and washers shall be mechanically galvanized to conform to the requirements of ASTM B695, Class 50.

Anchor studs shall be standard welded anchor studs, conforming to the requirements of Article M.06.02

Fasteners used to secure the sliding cover plate at the parapets and sidewalks shall conform to ASTM F593 and F594 (Type 316 Stainless Steel). The fasteners shall be recessed in the sliding plate such that the top of the fastener is flush with the sliding plate surface. This will require countersunk holes and flat head fasteners.

Field touch up paint for use at field welds and to repair damaged areas of the galvanizing shall be a zinc paint conforming to MIL-P-21035 and shall be brush-applied.

Concrete in the deck headers, curbs, sidewalks and parapets shall conform to Class PCC04462 Concrete.

The Contractor shall provide a Certified Test Report and Materials Certificate for the steel and anchor bolts and studs in accordance with the requirements of Article 1.06.07.

Construction Methods:

Shop Drawings: Before fabricating any section of expansion joint, the Contractor shall submit shop drawings to the Engineer for approval in accordance with Article 1.05.02-3. These drawings shall include but not be limited to the following information:

- A. The complete details of the method, materials and equipment proposed to be used in the installation.
- B. Plan of the joint showing the location of splices, welds, anchor studs, anchoring devices and erection angles.
- C. Complete details of fabrication of curb, sidewalk and parapet closure assemblies.
- D. Table of joint opening widths for various installation temperatures.
- E. Means of adjusting width and grade of the prefabricated joint assemblies.

Surfaces which are to be welded shall be cleaned and all protrusions shall be removed by grinding or other suitable methods.

Fabrication shall be in accordance with Article 6.03.03. The AWS Structural Welding Code D1.1 — Steel may be used for fabrication of the assembly.

Studs or any other mechanism used to anchor the finger joint assembly into the concrete shall be accurately installed in the shop at the locations shown on approved shop drawings.

Stud welding shall be in accordance with Article 5.08.03 with the exception that testing studs by bending with hammer blows is not required.

The assembled expansion joint shall not be installed until the deck concrete on the adjacent slabs has cured for a minimum of 10 days, and all superimposed dead loads have been placed on the adjacent spans except those which cannot be placed because of required construction sequence. Movement of the joint due to future superimposed dead loads shall be provided for by adjusting the width of the joint accordingly.

The profile of the joint in the pavement area shall conform to the roadway cross section. The expansion joint assembly shall be preset, in accordance with approved shop drawings, joint setting data and specifications. The assembly shall be properly secured for shipping. Provision shall be made for final field adjustment at the time of installation.

All movements due to factors such as shrinkage, creep and midspan deflection shall be properly accounted for prior to this final adjustment.

Concrete headers and adjacent portions of curbs, sidewalks and parapets shall be constructed in accordance with the applicable requirements of Article 6.01.03.

Method of Measurement:

This work will be measured for payment by the actual number of linear feet of joint completed and accepted, measured along the center line of the joint from curb line to curb line. The length of joint continuing up the curb and along the surface of parapets and sidewalks shall not be measured for payment.

Basis of Payment:

This work will be paid for at the contract unit price per linear foot for “Installation of Finger Joints”, complete in place, which price shall include furnishing and installing a steel finger expansion joint including steel curb, sidewalk and parapet closure assemblies, anchor studs, anchorage devices, anchor bolts, shipping devices, and concrete headers and all materials, equipment, and labor incidental thereto.

<u>Pav Item</u>	<u>Pav Unit</u>
Installation of Finger Joints	L.F.

ITEM #0521007A – ELASTOMERIC BEARINGS

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

Materials:

Elastomeric Bearings: The elastomer shall have a shear modulus between 0.130 and 0.200 ksi and a nominal hardness of 60 on the Shore A scale. It shall conform to the requirements of Section 18.2 of the AASHTO LRFD Bridge Construction Specifications.

The internal steel laminae shall conform to ASTM A709M Grade 36 or approved equal. The laminae shall be sandblasted and cleaned of all surface coatings; rust and mill scale before bonding and shall be free of sharp edges and burrs.

The bearing shall be cast as a unit in a mold and shall be bonded and vulcanized under heat and pressure. The mold finish shall conform to standard shop practice.

Flash tolerance, finish and appearance shall meet the requirements of the latest edition of the Rubber Handbook, published by the Rubber Manufacturer's Association, Inc., RMA F3 and T.063.

The tests of the elastomer specified in Table 18.2 of AASHTO LRFD Bridge Construction Specifications shall be conducted on each lot of bearings. A shear modulus test shall be performed on each batch of material. (A lot consists of a single type of bearing of the same size, manufactured from the same batch of elastomer, submitted for inspection at the same time. A batch of elastomer is the quantity of elastomer prepared and compounded at one time).

In lieu of the low temperature crystallization test for each lot of bearings and a shear modulus test for each batch of material, the manufacturer may provide certificates from tests performed on identical formulations within the preceding year.

Every bearing shall be visually inspected for compliance with dimensional tolerance and for overall quality of manufacture. Buffing, cutting, or any other attempt to alter the size of the bearings to meet tolerances will not be permitted.

The elastomer shall meet the minimum requirements specified in Table 18.2 of AASHTO LRFD Bridge Construction Specifications for durometer hardness, tensile strength, ultimate elongation, heat resistance, compression set, ozone resistance, low temperature brittleness, low temperature stiffness and low temperature crystallization. The shear modulus of the material shall be tested at 73° F using the apparatus and procedure described in Annex A of ASTM D4014

The steel laminae shall develop minimum peel strength of 5.1 k/ft. as tested in accordance with ASTM D429 Method B.

Every bearing shall be tested as follows for a Short-Duration Compression Test:

1. The bearing shall be loaded in compression to 1.5 times the design load shown on the plans. The load shall be held constant for 5 minutes, removed and reapplied for another 5 minutes.
2. The bearing shall be carefully examined while under the second loading.
3. If the bulging pattern indicates laminate parallelism or layer thickness outside of specified tolerance, or poor laminate bond, the bearing shall be rejected. If there are three or more separate surface cracks greater than 3/32" wide and 3/32" deep, the bearing shall be rejected.

A Certified Test Report in accordance with Section 1.06.07 shall be required for the specified tests on the elastomer and for the specified short duration compression tests.

Each elastomeric bearing pad shall have embossed on it the following: the word "CONN", project number, manufacturer's identification code or symbol, and the month and year of manufacture. The bearing shall also have stenciled on it, with indelible ink, the lot number, bridge number, and the bearing number. The marking shall be placed on a side of the bearing that is visible after installation.

For structures requiring less than fifty (50) pads, one test pad shall be furnished. For structures requiring more than fifty (50) pads, one extra test pad shall be furnished for each additional fifty (50) pads or part thereof. If there are two or more types of pads in one structure, and only test pad is required, the test pad will be furnished for the type of which there are the greater numbers. All test pads shall be furnished without charge.

All of the pads on one structure shall be manufactured by the same firm.

The manufacturer shall furnish facilities for the test and inspection of the competed bearing in his plant or at the independent test facility and the inspectors shall be allowed free access to the manufacturer's plant and test facility.

The load plates shall conform to AASHTO M270, Grade 50W.

Bolts shall conform to ASTM F3125 Grade A325 Type 3. The bolts, nuts, and washers shall be hot-dipped galvanized in accordance with ASTM 153.

Construction Methods: Before fabricating any materials, the Contractor shall submit shop drawings to the Engineer for approval in accordance with Subarticle 1.05.02-3. These drawings shall include but not be limited to the following information: the name of the manufacturer, complete details of the pads and pertinent material designations.

The bearing areas of the masonry upon which the elastomeric bearing pads are to be placed shall be carefully finished, by grinding if necessary, to a smooth, even level surface of the required

elevation, and shall show no variations from a true plane greater than 1/16 inches over the entire area upon which the elastomeric bearing pads are to rest.

After delivery of the bearings to the job site, the bearings shall be stored such that they are kept clean and dry at all times.

There shall be uniform bearing between the elastomeric bearing pad and the concrete seat after application of full dead load, there shall be uniform deflection of the elastomeric bearing pad.

Welding of the structural steel adjacent to elastomeric bearing pads shall not be permitted.

The elastomeric bearings shall be installed when the ambient air temperature has been within the range of 40°F - 80°F for a period of at least two hours.

Method of Measurement: This work will be measured for payment by the number per each of elastomeric bearings, installed and accepted.

Basis of Payment: This work will be paid for at the contract unit price per each “Elastomeric Bearings”, complete, in place, which price shall include furnishing and installing elastomeric bearing assemblies (including vulcanized load plates), and all materials, equipment, tools and labor incidental thereto.

The sole plates and filler plates (including bolts, nuts and washers) will be included in the contract unit price for “Structural Steel (Site No. X)”.

Pay Item
Elastomeric Bearings

Pay Unit
EA

ITEM #0522178A – CONSTRUCT CONCRETE KEEPER BLOCKS

Description: This item shall consist of constructing concrete keeper blocks including the furnishing and placing of reinforcing steel, steel keeper plates, welded studs and concrete. This work shall be done as indicated on the plans, in accordance with these specifications, and as directed by the Engineer.

Materials:

The steel keeper plates shall conform to ASTM A36 steel.

Steel for welded studs shall conform to the requirements of Subarticle M.06.02-4.

Concrete shall be Class PCC03340 type conforming to Article M.03.

Reinforcement shall conform to ASTM A615, Grade 60.

The steel keeper plates shall be galvanized after fabrication and welding of the studs in accordance with ASTM A123.

Certification: A Materials Certificate and a Certified Test Report shall be required for the steel keeper plates in accordance with Article 1.06.07, certifying the conformance of these materials to the requirements stated herein.

All materials shall be approved by the Engineer before use.

Construction Methods:

The installation of the keeper blocks shall be done after the two adjacent elastomeric bearings have been installed.

The surface on which the concrete keeper is to be poured shall be intentionally roughened to a depth of 1/2 inch.

Fabrication and placement of reinforcing steel shall conform to the requirements of Article 6.02.03.

The installation of welded studs shall be in accordance with the requirements of Article 5.08.03. Mixing, placing, curing and finishing of the concrete shall be in accordance with Article 6.01.03.

The Contractor shall make test cylinders under the supervision of the representative of the Department. The dimensions, type of cylinder mold and number of cylinders shall be specified by the Engineer.

The Contractor, as directed by the Engineer, shall take adequate precautions to prevent any materials from dropping to the area below, which may result in damage to any existing construction or to adjoining property. Should any damage occur to the structure as a result of the Contractor's operations, the Contractor shall make repairs at his own expense. The repair work shall be approved in advance and shall be of a quality acceptable to the Engineer.

At no time during the Contractor's work will interruption in traffic carried by the structure be permitted solely as a result of constructing the keeper block.

Before fabricating any materials, the Contractor shall submit shop drawings to the Engineer to review in accordance with Article 1.05.02-3. These drawings shall include but not be limited to the following: Location and sizes of all reinforcing steel including splice lengths, steel plates and studs, material lists and material designations.

Method of Measurement:

This work will be measured for payment by the number of concrete keeper blocks, as described above, completed and accepted by the Engineer.

Basis of Payment:

This work will be paid for at the contract unit price each for “Construct Concrete Keeper Blocks”, complete in place, which price shall include furnishing and placing reinforcing steel, steel keeper plates and welded studs, concrete, and all materials, equipment, tools and labor incidental thereto.

Pay Item

Construct Concrete Keeper Blocks

Pay Unit

EA

ITEM #0522410A - POT, SPHERICAL OR DISC BEARINGS (300 KIPS)
ITEM #0522440A - POT, SPHERICAL OR DISC BEARINGS (900 KIPS)
ITEM #0522442A - POT, SPHERICAL OR DISC BEARINGS (950 KIPS)

Description: The work covered by this specification shall consist of designing, furnishing, fabrication and installation of high-load multi-rotational bearings, including all materials located below the girder flange plate and above the supporting element, in accordance with the plans and specification. This work also includes attachment of the bearings assemblies to the girders and supporting elements via bolting, welding, and/or anchor rods. The high-load multi-rotational bearings may be of any type covered by this specification provided they are supplied by only one manufacturer. The bearing load capacity indicated in parentheses in the title of this special provision designates the service limit state maximum vertical design load.

Materials: All material used in the construction of bearings shall fully comply with the latest editions of the AASHTO LRFD Bridge Design Specifications Section 14 and of the AASHTO LRFD Construction Specifications Section 18, and as indicated below:

Steel: All steel, except steel for guide bars and shear-restriction pins and sleeves shall conform to ASTM A709, Grade 50W. Guide bars and shear-restriction devices shall be as detailed by the manufacturer, unless otherwise specified.

Stainless steel sliding surfaces shall conform to ASTM A 167 or A240 Type 304 with a surface finish of 20 micro-inches RMS or less. Welded stainless steel overlay shall be produced using Type 309L electrodes.

High Strength Bolts: High strength bolts, where required, shall conform to the requirements of ASTM F3125 Grade A325 (formerly ASTM A325) and shall conform to the requirements of M.6.02-3.

Anchor Rods: Anchor rods shall conform to the requirements ASTM F1554 Grade 105 (Fy 105 ksi), unless noted otherwise on the Plans. The anchor rods, nuts, washers, and couplers shall

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be galvanized in accordance with ASTM 123 and ASTM 153. Where couplers are required per the plans, they shall be fabricated such that the anchor bolt and anchor rod cannot be threaded past the midpoint of the coupler.

Polytetrafluoroethylene (PTFE): PTFE sliding surfaces shall be made from virgin TFE resin in accordance with ASTM D4894.

Main sliding surface PTFE shall be unfilled, dimpled and lubricated. Dimples must have a minimum edge distance of 0.5” and conform to 1998 AASHTO LRFD, Section 14.7.2.

Guide bar surface PTFE shall be pigmented, filled or unfilled.

Sealing Ring: Sealing rings shall be made of brass, round in cross section, and shall conform to Federal Specification QQB626, composition 22, half hard.

Lubricant (Pot Bearing Disc): Lubricant for pot bearing discs shall be a silicone compound conforming to MIL-5-8660, or an equal approved by the Engineer.

Prefabricated Pads: Prefabricated pads shall be 1/8 inch thick and shall conform to the requirements of M.12.01.

Non-Shrink Grout: The non-shrink grout shall conform to the requirements of M.03.05 and shall be flowable type capable of being pumped with a positive displacement pump through an opening 1/8 inch in diameter.

Material Certification: The Contractor shall provide a Certified Test Report and Materials Certificate for the following materials in accordance with the requirements of Article 1.06.07:

- Elastomer disk
- PTFE Sheets
- High strength bolts
- Zinc silicate
- Prefabricated Pads
- Non-Shrink Grout

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The Engineer shall reserve the right to request any additional certifications at no additional cost to the State.

The Contractor shall provide a Materials Certificate for steel and lubricant for elastomeric discs (pot bearing) in accordance with requirements of Article 1.06.07.

Construction Methods:

Design: High load multi-rotational bridge bearings shall be pot, disc or spherical bearings designed for the strength and service limit state design loads and rotations shown on the plans. The design and fabrication of high load multi-rotational bridge bearing shall comply with the latest editions of the AASHTO LRFD Bridge Design Specifications Section 14, and the AASHTO LRFD Construction Specifications Section 18, and as specified herein:

Design calculations and detailed working drawings for the bearings shall be sealed by a Professional Engineer, licensed in the State of Connecticut, and submitted to the Engineer for review, in accordance with the requirements of Article 1.05.02. The drawings shall include, but not be limited to, the following:

- A. Plan view and section elevations, providing all fabrication dimensions and required surface finishes.
- B. All ASTM, AASHTO, and other material designations.
- C. Bearing design capacity for load, translation, and rotation at strength and service limits states.
- D. A Schedule of all bearing offsets if required by the project.
- E. A warning note shall be inserted on all pot bearing shop plans or working drawings on which field welding is required that no welding current shall be permitted to pass between pot and piston components.

The design calculations shall be complete, verifying conformance of the bearing to provisions of this specification.

General Requirements: Multi-Rotational bearings shall be designed to accommodate the loads, forces and movements specified in the bearing schedule. Particular care shall be taken that all components of the bearings provide adequately for the horizontal loads and forces specified.

Maximum design stresses for all bearing components shall not exceed the allowable design stresses of the latest editions of the AASHTO LRFD Bridge Design Specifications Section 14 and the applicable sections of this specification.

Minimum rotation capacity (R_b) shall be the sum of $R_s + R$.

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Minimum horizontal load capacity for fixed and guided bearings shall be as specified on the contract plans but in no case less than 15% of the vertical dead load shown on the plans. Expansion bearings shall be designed for additional movement capacity, in each direction, beyond the design movement indicated on the plans. The additional movement capacity shall be 10% of the design movement or 1 inch, whichever is greater. Spacing between the guides of the bearing do not require this additional movement capacity.

Where shown on the plans, an auxiliary plate shall be provided for all bearings as noted in the specification herein. The auxiliary plate shall be designed to fit between the bearing proper and the masonry plate. The auxiliary plate shall be engaged with the bearing proper by means of a properly designed shop weld, or by a "saucer-like" machined recess to snugly fit the base of the bearing. The purpose of the auxiliary plate is the following:

- a. to provide a means of field installation adjustment and sufficient horizontal restraint for the base of the bearing proper without a field weld directly to the bearing where access is often difficult
- b. to simplify the future removal and replacement of the bearing assembly in the event maintenance is required
- c. to reduce the possibility of heat damage to critical bearing components during field welding installation

Bearing shall be designed so that all rotational and sliding elements can be replaced with a minimum lifting not to exceed 0.5 inch.

All specified machined surface finish tolerances shall be verified using a calibrated profilometer provided by the Contractor and approved by the Engineer.

Overall bearing height if different from that shown on the contract plans shall be accompanied by the necessary adjustment in the bearing pad elevation. Overall bearing height shall be not more than 0.25 inches greater than, nor zero (0) inches less than detail dimension provided on the fabrication working drawings.

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Welding shall conform to the requirements of AWS D 1.1 Structural Welding Code and shall comply with the latest edition of the AASHTO LRFD Bridge Design and Construction Specification Requirements.

Bearing Requirements:

The pot shall be machined from a single solid piece of steel. The pot inside diameter (D_p) shall be the same as the elastomeric disc.

No coating shall be applied to the inside surface of the pot to be in contact with the elastomeric disc, except silicone lubricant required for the lubrication.

The disc shall be lubricated with a silicone compound conforming to the requirements of MIL-5-8660 or other approved equal.

Pistons shall have the lower corner chamfered at 45 degrees for a maximum depth equal to 1.7 times the diameter of the sealing ring where the seal will seat wholly within the piston thickness (above elastomeric disc), and 1.2 times the diameter where it extends into the elastomeric disc.

Rings shall be rolled into a circle from round rod cut according to the LRFD Bridge Design Specifications and brazed or soldered to form a ring. The brazing or soldering process shall be adequate to fully develop the tensile strength of the rod. The ring shall fit the pot snugly (ANSI Class LC1, Standard Fit) so that it is in full contact with the pot wall and the top of the elastomer when installed. Tensile stress in the ring as a result of elongation at maximum bearing design rotation and maximum vertical and horizontal design loads shall not exceed $0.55 \times F_y$.

Silicone lubricant shall be applied to all surfaces in contact with the ring during assembly.

Spherical Bearings Requirements:

The radius of the spherical element concave PTFE surface shall be determined such that the resulting geometry of the bearing is capable of withstanding the greatest ratio of horizontal load to vertical load under all loading conditions to prevent unseating of the concave element.

The concave surface shall face down whenever possible.

PTFE fabric in the free-state shall be a minimum of 0.08 in. thick when measured in accordance with ASTM D1777.

Minimum center thickness of spherical surfaces shall be 0.75 inch.

The edge thickness of the convex element shall be a minimum of 0.75 inch for bearings directly on concrete or 0.5 inch for bearings directly on steel.

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Disc Bearing Requirements:

Steel contact surface for elastomeric disc: Inside surfaces facing the elastomeric disc shall receive a commercial shot blast finish in accordance with SSPC SP-6.

Non-Rotational Bearing Element Requirements:

PTFE: Maximum contact stresses on the PTFE at the service limit state shall comply with AASHTO LRFD Bridge Design Specifications Table 14.7.2.4-1.

Stainless Steel: The stainless steel surface shall cover the mating surface in all operating positions plus one inch in each direction of movement.

Stainless steel sheet shall be seal-welded around the entire perimeter using techniques which ensure it remains in contact with the backing plate.

Guide Bars and Guide Keys:

Central Guide keys may be made integral by machining from the solid. Where a separate key or guide bar is used they shall be fitted in a keyway slot machined to give a press fit and bolted or welded to resist overturning. Guide bars may be made integral by machining from the solid or fabricated from bars welded, bolted, and or recessed at the manufacturing option.

Guide bars and central guide keys shall be designed for the specified horizontal forces, but not for less than 15% of the vertical capacity of the bearing.

The sum of clearances between guided surfaces shall not exceed 1/8 inch. Net contact area between guiding surfaces must remain constant throughout all operating positions.

All guide bars and guide keys shall be self-aligning and shall bear on elements of suitable size and strength to resist lateral forces indicated on the plans (i.e., guides in pot bearings must bear against piston components; guides in spherical bearings must bear against unfixed spherical components.)

Guiding directly between fixed bearing components shall not be permitted. Stainless steel and PTFE are required on guiding surfaces. The compressive stress on PTFE shall not exceed the following average bearing stresses:

	Unfilled PTFE	Filled
PTFE All loads except seismic loads	3,500 psi	3,500 psi

(PTFE on guiding surfaces need not be designed for seismic loading.)

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Edge load pressure due to all loads and rotation (except seismic) shall not exceed 5,000 ksi for filled or unfilled PTFE.

PTFE on guiding surfaces shall be 3/16 inch minimum thickness, epoxy bonded into a square edged recess 3/32 inch deep in the substrate. In addition, the PTFE shall be mechanically fastened by a minimum of two screws into the substrate, located at a distance equal to twice the nominal screw diameter from the end of the PTFE strip. The top of the screws shall be recessed an amount not less than the minimum of one half the PTFE relief.

Travel Stops: Travel stops if detailed on the plans shall be capable of resisting the horizontal forces specified. The stops shall be set at 150% of the longitudinal movement or as directed on the plans.

Top Plate, Sole Plate, Auxiliary Plate, and Masonry Plate Requirements:

Where top plates, sole plates, and masonry plates bear on concrete the concrete bearing stress on the loaded area shall not exceed the limits specified in latest editions of the AASHTO LRFD Bridge Design Specifications.

Top or sole plates, if necessary, shall be beveled where they bear on steel to such that the lower surface of the top plate is level in the transverse and longitudinal directions when the bridge is open to traffic.

Special consideration shall be given to the design of top and sole plates (or plate to which sliding elements are attached) to assure that any bending forces imparted during field installation do not deflect the sliding surfaces. (The top or sole plate, for example, may be subject to extreme bending forces during a retrofit installation as a result of vertical load conditions prior to the completion of field welding.)

The top, sole, or masonry plates shall be shop welded to the bearing proper, unless otherwise noted on the plans. Auxiliary plates, where required, shall be located between the bearing proper and the masonry plate. The auxiliary plate shall be shop welded to the bearing proper, or shall have a "saucer-like" recess which shall snugly fit and restrain the bearing, and have adequate capacity to resist all required design forces. All field welds required for the anchoring of the lower bearing unit shall be limited to the interface between the masonry plate and auxiliary plate.

The top, sole, auxiliary, or masonry plates shall be designed for all required shear and bending forces in accordance with the latest editions of the AASHTO LRFD Bridge Design Specifications. If a recess is machined for the bearing or guide bars, it shall be not less than 1/2 inch in depth. The recessed surface on which the bearing proper will bear shall be machined to a

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tolerance equal to $0.0005 \times$ the diameter or width or recess. The minimum thickness of the auxiliary plate after machining of the recess shall be 1 inch.

Unless otherwise approved by the Engineer, the auxiliary and sole plates shall extend a minimum of 1 inch beyond the plan limit of the pot (or lower spherical element); bearing travel stops; or other bearing components in all plan directions, to provide access for required field welds.

Testing Requirements:

Sampling and testing shall be performed on bearings as specified in the latest AASHTO LRFD Bridge Construction Specifications Section 18.1.5 with the exception of the Long Deterioration Test, to ensure the requirements of the specification have been met. All tests described in the aforementioned Section 18.1.5 shall be performed in accordance with specified requirements therein and as specified herein.

Tests shall be performed on randomly selected samples from the production bearings. One bearing per "lot" shall be tested. One lot shall not exceed a single contract or project quantity. One lot shall not exceed 25 bearings. A lot shall consist of those bearings of the same type within a "Load Category". Bearing types shall be fixed type bearings or expansion type bearings. Guided and non-guided expansion bearings will be considered a single type.

One load category shall consist of bearings of differing vertical load capacity within a load range as outlines below:

- For bearings less than or equal to a service limit state load capacity of 1000 kips, the Load Category shall be based on a range of 500 kips.
- For bearings greater than a service limit state load capacity of 1000 kips but less than or equal to 3000 kips capacity, the Load Category shall be based on range of 1000 kips.
- For bearings in excess of 3000 kips capacity the Load Capacity shall be based on a range of 2000 kips.

Long-Term Deterioration Test: This test shall be performed on at least one expansion bearing, manufactured for the project, with a rated service limit state load capacity of 300 Kips or higher. The test does not have to be performed if documentation is submitted demonstrating a Long-Term Deterioration Test has been successfully performed and accepted on another Connecticut Department of Transportation project, for a bearing of equal or greater capacity, and of the same type and material properties to be supplied for the current project. The successful Long-Term Deterioration Test must have been completed within one year of the current project advertising date.

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Only bearings from lots from which test specimens have passed all the above requirements will be approved for use in the structure.

Bearings with capabilities that exceed the manufacturer's testing capacity shall be tested at an approved testing laboratory. If suitable test equipment is not available in the United States, alternative testing/inspection procedures will be agreed between the Engineer and the manufacturer.

Shipping and Packing:

Bearing assemblies shall be securely fixed together as units so that they may be shipped to the job site and stored without relative movement of the bearing parts or disassembly at any time. Bearings shall be wrapped in moisture resistant and dust resistant material to protect against shipping and job site conditions.

Care shall be taken to ensure that bearings at the job site are stored in a dry sheltered area free from dirt or dust until installation.

When bearings are to be inspected on site, they shall be inspected within one week of arrival and may not be disassembled except under the supervision of the manufacturer or his representative or with the written approval of the manufacturer. Following inspection, the wrapping shall be reapplied and the bearings kept clean until installation.

Removal of top plates of bearings for separate attachment to the structure is not permitted except under the direct supervision of the manufacturer and by approval of the Engineer.

Installation Requirements:

Bearings shall be evenly supported over their upper and lower surfaces under all erection and service conditions.

Bearings shall be lifted only by their underside or specially designed lifting lugs.

When installing bearings, extreme care shall be exercised to protect bearing surfaces from damage and contamination.

The bearing assembly shall be aligned with the superstructure as shown on the plans. On guided bearings, special care must be taken to properly align the guiding mechanism with the designated expansion direction of the structure as shown on the plans.

Bearing straps or retaining clamps shall be left in place as long as possible to ensure parts of bearings are not inadvertently displaced relative to each other. Care must be taken to remove straps or clamps before any normal structural movement takes place.

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Offsets of upper and lower bearing parts shall be set as required by the plans to compensate for load deflection, temperature movement, and elastic shortening and creep of post-tensioned concrete superstructure as the case may be.

Bearings installed on a concrete substructure shall be installed over a preformed fabric pad, or shall bear upon non-shrink grout, as indicated on the plans.

Bearings shall be installed over a prefabricated pad on a concrete bearing pad. The concrete bearing pad surface shall be prepared to the correct elevation and finished to the following flatness tolerance:

For bearings seats up to 3.1 in. in length or width: +0.06 in
 For bearings seats over 3.1 in. but less than 4.5 in.: +0.09in.
 Bearing seats over 4.5 in.: +0.125 in
 There shall be no projecting irregularities exceeding 0.03 in.
 Bearings seats shall be level within 1:200 slopes.

The masonry plate shall be installed level to within 1:200 slopes. The anchor rod protrusions above the masonry plate surface shall be cut off with the annulus filled with non-shrink epoxy grout that shall be installed in accordance with the manufacturers written recommendations.

The mating surface with the superstructure shall be a plane surface to within a slope of 1:200.

Following alignment of the bearing components, the bearing shall be field welded or bolted in position as shown on the plans. Welding procedures shall be established by the Contractor to restrict the maximum temperature of the bonded PTFE surfaces to 300° F and maximum temperature of the elastomer (Polyether-urethane, Neoprene or Natural Rubber) to 250°F. Temperatures shall be determined by temperature indicating wax pencils or other suitable means.

Welding current shall at no time be permitted to pass through the piston/pot assembly.

Particular care shall be exercised to mask and protect the PTFE and polished stainless steel surfaces.

The Contractor shall repair any damage to bearing finishes following installation at no cost to the State as directed by the Engineer.

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A continuous bead of silicone, 1/4 inch thick, shall be applied along the interface between auxiliary plate and the bearing proper following completion of metallizing where the bearing proper is retained by a recessed opening in the auxiliary plate.

Method of Measurement: This work will be measured for payment by the number of each pot, spherical or disc bearing of the load capacity indicated, fabricated, installed, and accepted.

Basis of Payment: This work will be paid for at the contract unit price for "Pot, Spherical or Disc Bearings" of the load capacity indicated, complete in place, which price shall include the design, all materials, fabrication, testing (including extra bearings if required for testing), equipment and labor incidental thereto. It also shall include the installation, including the masonry plate, grout or pad, and all materials, tools and labor incidental thereto.

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ITEM #0601954A – EPOXY INJECTION CRACK REPAIR

Description: Work under this item shall consist of surveying the existing concrete substructure, locating all cracks to be repaired, and repairing the cracked concrete with a two-component modified epoxy resin system injected into the cracked concrete under low pressure using continuous positive displacement metering and mixing equipment as directed in accordance with these specifications.

This item shall also include providing of a safe access to the structure for the delineation of the repair locations and review of the performed repair work. The Contractor shall not perform any repair work without prior approval of the Engineer for location, limits and types of repairs.

Materials:

The modified epoxy resin shall be a pre-qualified epoxy resin (See Appendix A). A Materials Certificate and a Certified Test Report in accordance with Article 1.06.07 shall accompany each batch or lot of the material delivered to the job site, to verify the epoxy resin's conformance with the manufacturer's supplied infrared spectroscopy test results.

A batch of each component will be defined as that quantity of material that has been subjected to the same unit chemical or physical mixing process intended to make the final product substantially uniform.

Each component shall be packaged in steel containers not larger than 5 gallons in volume. The containers shall have lug type crimp lids with ring seals, shall be new, not less than 0.024-inch nominal thickness, and shall be well sealed to prevent leakage. If a lining is used in the container, it shall be of such character as to resist any action by the components. Each container shall be clearly labeled with the designation (component A or B), manufacturer's name and date of manufacturer, batch number and the following warning:

CAUTION: This material will cause severe dermatitis if it is allowed to come in contact with the skin or eyes. Use gloves and protective creams on the hands. Should this material contact the skin, wash thoroughly with soap and water. Do not attempt to remove this material from the skin with solvents. If any material gets in the eyes, flush for 10 minutes with water and secure immediate medical attention.

Any material, which shows evidence of crystallization or a permanent increase in viscosity or settling of pigments that cannot be readily dispersed with a paddle, shall not be used.

Construction Methods:

A survey shall be undertaken by the Contractor on the area designated to be repaired, under the direction and to the satisfaction of the Engineer, to determine the exact limits and location of the area to be repaired under this item.

At the time of mixing, components A and B and the substrate temperature shall be between 50° and 85° Fahrenheit, unless the material has been pre-qualified at a temperature less than 75° Fahrenheit,

in which case this lesser temperature shall govern the use of the material. Any heating of the adhesive components shall be done by application of indirect heat. Immediately prior to filling the tanks of the mixing equipment, each component shall be thoroughly stirred with a paddle. Separate paddles shall be used to stir each component.

Cracks less than 20 mils in width shall not be repaired under this item unless directed by the Engineer.

Prior to sealing, the crack shall be cleaned of dust, silt and any other material, which would impair proper bonding. Cleaning shall be done with compressed air jets free of oil or by vacuum cleaning with an industrial vacuum cleaner.

Injection ports shall be inserted in the cracks at intervals not less than the thickness of the concrete being injected. At the end of a crack or at a point where the thickness of the crack becomes less than 20 mils, the first port shall be half the distance from this point. The Contractor may use either surface injection ports or insertable injection ports as recommended by the manufacturer of the epoxy.

Drilling of the injection ports shall be done with a hollow drill bit to which vacuum is applied with and industrial vacuum cleaner. The drill shall not contact any steel reinforcing or pre-stressing strands or ducts. A pachometer shall be used to locate the embedded steel.

Spacing of the ports shall be such that the injected adhesive will substantially fill the crack without excessive waste. If necessary to meet this this requirement, the spacing of the ports shall be revised as approved by the Engineer as the injection process progresses. The surface of the crack between ports shall be sealed with tape or other temporary surface sealant, which can retain the epoxy adhesive in the crack during pressure injection and shall remain in places until the epoxy has hardened. Sealant tape and/or temporary surface sealant shall also be removed, and any spillage of epoxy shall also be removed.

Epoxy adhesive shall be pumped into the cracks through the injection ports. The pump, hose, injection gun and appurtenances shall properly proportion and mix the epoxy and shall be capable of injecting the epoxy at a sufficient rate and pressure to completely fill all designated cracks. A suitable gasket shall be used on the head of the injection gun to prevent the adhesive from running down the face of the concrete. Pumping pressure shall be kept as low as practicable.

The temperature of the concrete shall not be less than 50° F at the time epoxy is injected, unless the epoxy has been pre-qualified at a lower temperature as hereinbefore provided, in which case the lower temperature shall govern.

For a crack with uniform thickness, the epoxy adhesive shall be forced into the first port at one end of the crack until adhesive runs in substantial quantity from the next adjacent port. The first port shall then be sealed, and injection started at the next port. Injection shall then continue from port to port in this manner until the crack is fully injected.

Cracks with non-uniform thickness shall have the epoxy adhesive forced into the port at the widest separation in the crack until adhesive runs in substantial quantity from the two adjacent ports. The first port shall then be sealed, and injection started at the adjacent port corresponding to the shortest

length of the crack. Injection shall then continue from port to port in this manner until the short side of the crack is fully injected. Then, beginning with the port to port until the crack is fully injected. For slanting or vertical cracks, pumping shall start at the lower end of the crack. Where approximately vertical and horizontal cracks intersect, the vertical crack below the intersection shall be injected first. The ports shall be sealed by removing the fitting, filling the void with epoxy and covering with tape or surface sealant.

Before starting injection work and at 2-hour intervals during injection work when requested by the Engineer, a 3-fluid ounce sample of mixed epoxy shall be taken from the injection gun. Should these samples show any evidence of improper proportioning or mixing, injection work shall be suspended until the equipment or procedures are corrected.

Samples obtained above shall be used directly, without further stirring, to make test pieces for the Slant Shear Strength on Dry Concrete. One test piece shall be made at the beginning, middle and end of daily operations. The sample shall be allowed to cure for 7 days in the "Concrete Cylinder Curing Box." On the 7th day, the samples shall be removed to the laboratory and test in accordance with the requirements for Slant Shear Strength (see Appendix A, attached).

Each sample shall be numbered consecutively and dated (with a waterproof marker) and it shall be noted which sample represents which part of the structure.

Technical Advisor: The Contractor shall obtain the services of a Technical Advisor who is employed by the manufacturer of the epoxy resin. The Technical Advisor shall assist the Engineer and the Contractor in the correct use of the injection resin. The Advisor shall be a qualified representative approved by the Engineer and shall be at the site of the work when the work begins in connection with the epoxy injection and at such other times as the Engineer may request until completion of this item.

Method of Measurement:

Epoxy Injection Crack Repair shall be measured by the actual number of linear feet of cracks injected and sealed with epoxy and accepted by the Engineer.

Where cracks are designated for injection on opposite sides of a concrete member and the epoxy adhesive injected on one side penetrates through the members to completely fill the crack on the opposite side, payment will be made for the cracks on both sides as though injection had been performed on both sides, except that no payment will be made for such cracks on the opposite side that were not designated by the Engineer for injection. No payment will be made for such cracks on the opposite side that are smaller than 20 mils.

Where a crack designated for injection extends around the corner of a concrete member, the length of crack on both faces will be measured for payment.

Providing a safe access for delineation and inspection of the performed repairs will not be measured for payment.

Basis of Payment:

“Epoxy Injection Crack Repair” will be paid for at the Contract unit price per linear foot, complete in place, which price shall include providing scaffolding or other access for the Engineer’s inspection and delineation, services of a qualified technical advisor, surface preparation and all materials, equipment, tools, labor and clean-up incidental thereto.

Pay Item	Pay Unit
Epoxy Injection Crack Repair	l.f.

APPENDIX A**Prequalification Procedure**

The Prequalification Procedure shall consist of the following test procedure on the mixed epoxy resin at a temperature of 77° unless the Contractor desires to use the material at a lower temperature than 50°F, in which case the lower temperature shall be used to condition the material and test pieces.

<u>Test:</u>	Viscosity
<u>Requirements:</u>	900 centipoise max. @ 20°F (±2°F) 4000 centipoise max. @ any temperature
<u>Test Method:</u>	ASTM D 2393

<u>Test:</u>	Gel Time (Pot Life)
<u>Requirement:</u>	4 to 60 minutes
<u>Test Method:</u>	

A. Apparatus

1. Unwaxed paper cups, 8 oz., 2 1/4 inches at base (Dixie Cup No. 4338 or equivalent).
2. Wooden tongue depressor with ends cut square (Puritan No. 705 or equivalent).
3. Stainless steel spatula with blade 6" x 1" and with end cut square.
4. Stopwatch, 1 second or smaller divisions.
5. Balance, 0.1-gram divisions.

B. Test Procedure

1. Condition both A and B components to required temperature (±2°F).
2. Measure proper volumes of well-mixed components A and B into an 8-oz. unwaxed cup to yield total mass of 60 grams (±2.0 grams).
3. Start stopwatch immediately and mix components for 60 seconds, stirring with a wooden tongue decompressor taking care to scrape the sides and bottom of the cup periodically.
4. Place the sample at the required temperature (±2°F) on a wooden bench top which is free of excessive drafts.
5. Probe the mixture once with the tongue depressor every 30 seconds starting 4 minutes from the time of mixing.
6. The time at which a soft stringy mass forms in the cup is the gel time.

Test: Slant Shear Strength of Wet Concrete

Requirements: 1700 psi min. after 7 days of cure in air at the required temperature ($\pm 2^{\circ}\text{F}$)

Test: Slant Shear Strength of Dry Concrete

Requirements: 4500 psi min. after 7 days of cure in air at the required temperature ($\pm 2^{\circ}\text{F}$)

Test: Slant Shear Strength**A. Materials**

1. Ottawa sand, ASTM C109
2. Portland cement, Type II
3. Water

B. Apparatus

1. Suitable mold to make diagonal concrete mortar blocks with a square base with 2-inch sides and having one diagonal face 2" x 4" starting 3/4 inch above the base. The diagonal faces of two such blocks are bonded together producing a block of dimensions 2" x 2" x 5".
2. Block made from the following composition:

- Ottawa sand, ASTM C109	30.1 lbs
- Portland cement, Type II	12.1 lbs
- Water	4.8 lbs

Cure blocks 28 days in a fog room. Dry and lightly sand blast diagonal faces.

3. Suitable test press.

C. Test Procedure

Condition the components for 4 hours at the required temperature ($\pm 2^{\circ}\text{F}$). Without entrapping air, stir the separate components for 30 seconds and place the proper volumes of each component on a plate and mix with a spatula for 60 seconds. Apply a coat approximately 0.010-inch-thick to each diagonal surface. Place 4 1/8-inch square pieces of shim stock 0.012 inch thick on one block to control final film thickness. Before pressing the coated surfaces together, leave the blocks so that the coated surfaces are horizontal until the epoxy reacts slightly to prevent excessive flow. Press diagonal surfaces of each block together by hand and remove excess epoxy adhesive.

Align the blocks so that the ends and sides are square and form a block 2" x 2" x 5". Use

blocks of wood or metal against each 2" x 2" end, to keep diagonal faces from slipping until epoxy hardens.

After the required cure time, apply a suitable capping compound to each of the 2" x 2" bases, and test by applying a compression load with a universal test Machine or other suitable testing apparatus at the rate of 5000 lbs./min. until failure.

Report results in pounds per square inch.

$$= \frac{\text{load in pounds}}{4}$$

For wet shear strength, soak another set of blocks in water for 24 hours at the required temperature ($\pm 2^\circ\text{F}$). Remove and wipe off excess water. Prepare, cure, and test sample according to above test procedure.

<u>Test:</u>	Tensile Strength
<u>Requirements:</u>	4500 psi Min.
<u>Test:</u>	Elongation
<u>Requirements:</u>	15% Max.
<u>Test Method:</u>	Tensile Strength and Elongation

A. Apparatus

1. Leveling table about 12" x 8" with removable rim 1/4-inch thick by 1/2-inch wide.
2. Mylar or similar plastic sheeting 0.004-inches thick.
3. Air circulation oven capable of maintaining 158°F ($\pm 3^\circ\text{F}$).
4. Cutting die, Figure I
5. Thickness gauge, 1/8-inch.
6. Release agent, non-silicone type.

B. Procedure

1. Place Mylar sheet on leveling table.
2. Coat inside edge and bottom of rim with the release agent and secure to table with screws.
3. Level the table.
4. Mix sufficient volume of well-mixed component A and well mixed component B in the proper volumes so as to be able to form a layer 1/8 inch deep when placed inside the ring on the leveling table.
5. Introduce as few bubbles as possible during mixing.
6. Flush surface of epoxy with a heat gun or Bunsen burner to remove air bubbles on surface Repeat if necessary.
7. Allow the specimen to cure for 18 hours at the required temperature ($\pm 2^\circ\text{F}$).
8. Remove specimen from table and strip off Mylar sheet. Cure specimen for 5 hours at

158°F ($\pm 3^\circ\text{F}$).

9. Allow specimen to cool to the required temperature and cut specimens using cutting die shown in Figure I.
10. Proceed as specified in ASTM D 638, using 0.2-inches/minute test rate and 1-inch gauge length.

Test: Infrared Spectroscopy

Requirement: Infrared Spectroscopy Tests shall be obtained of Components A and B.

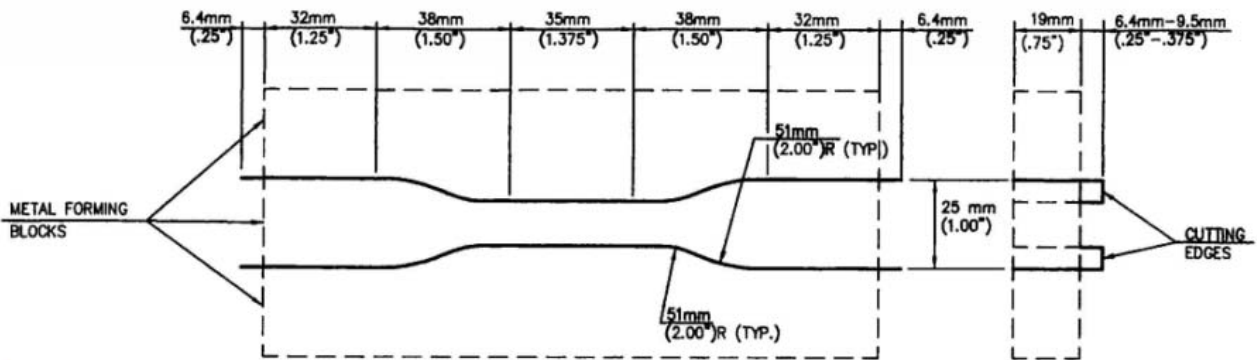
Test Method: Recording Spectrophotometer

A. Apparatus

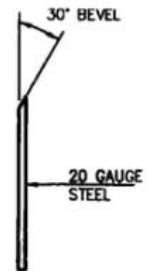
1. Perkin-Elmer Model 137-B Infracord Spectrophotometer, automatic recording system from 2.5 microns to 15 microns with a two-speed recorder or similar. Comparable results can be obtained with similar resolution.
2. Disk holder for a one-inch diameter disk.
3. Two sodium chloride crystal disks one-inch in diameter.
4. Sorvall SS-3 Automatic Superspeed Centrifuge or equivalent, which is able to separate the liquid and solid phases of the epoxy components without previous dilution with solvents.

B. Procedure

1. Place about 15 grams of component A into a stainless-steel centrifuge tube.
2. Counterbalance with component B in a second centrifuge tube.
3. Centrifuge the two components at 17000 rpm until there is a supernatant liquid layer present in each tube. This takes 20 to 30 minutes.
4. Place a drop of component A liquid layer on a sodium chloride disk.
5. Place another sodium chloride disk over the drop, rotate, and press down until the liquid has flowed into a uniform layer of proper thickness between the two sodium chloride disks.
6. Place the disks in the holder and run an absorption curve with the infrared spectrophotometer.
7. More or less liquid may be used between the disks so to produce a maximum absorption of 0.7 to 1.0 for the strongest absorption point on the curve.
8. Clean the disks with toluene and dry.
9. Repeat steps 4 through 8 with the liquid layer from component B.
10. Record each curve in order that they may be used for comparison purposes with lots of material delivered to the job site.



NOTE
 CUTTING EDGES ARE OF 20 GAUGE SPRING STEEL AND ARE HELD BETWEEN THREE METAL BLOCKS MACHINED TO CONFORM TO THE ABOVE DIMENSIONS.



SECTION OF CUTTING EDGE

FIGURE 1
CUTTING DIE FOR TENSILE TEST
 N.T.S.

ITEM #0602910A - DRILLING HOLES AND GROUTING DOWELS

Description: Work under this item shall consist of drilling holes in existing concrete and grouting reinforcing dowels at the locations shown on the plans, in accordance with the plans, the manufacturer's recommendations, and as directed by the Engineer. For the purposes of this specification, a dowel is defined as a reinforcing bar.

Materials: The chemical anchoring material shall conform to Subarticle M.03.07.

Construction Methods: Before fabricating any materials, the Contractor shall submit manufacturer's specifications and installation for the chemical anchoring material to the Engineer for review in accordance with Article 1.05.02.

Holes for the dowels shall be located as shown on the plans. The holes shall clear the existing reinforcement and provide the minimum cover as shown on the plans. A pachometer shall be used to locate existing reinforcing steel. If existing reinforcing is encountered during the drilling operation, the holes shall be relocated and the uncompleted holes shall be filled with the chemical anchoring material and finished smooth and flush with the adjacent surface.

If the depth and diameter of a hole is not shown on the plans, the hole shall conform to the manufacturer's recommendations for the diameter of the dowel being anchored such that the grouted dowels will be able to develop, in tension, 100 percent of its specified yield strength.

Hole drilling methods shall not cause spalling, cracking, or other damage to the existing concrete. The weight of the drill shall not exceed 14 lbs. Those areas damaged by the Contractor shall be repaired by him in a manner suitable to the Engineer and at no expense to the State.

Prior to placing the chemical anchoring material in the holes, the holes shall be cleaned of all dirt, moisture, concrete dust and other foreign material. The dowel and the chemical anchoring material shall be installed in the holes in accordance with the chemical anchoring material manufacturer's recommendations.

The Contractor, as directed by the Engineer, shall take adequate precautions to prevent any materials from dropping to the area below, which may result in damage to any existing construction or to adjoining property. Should any damage occur to the structure as a result of the Contractor's operations, the Contractor shall make repairs at his own expense. The repair work shall be approved in advance and shall be of a quality acceptable to the Engineer.

Method of Measurement: This work will be measured for payment by the actual number of drilled holes in which dowels are embedded and accepted.

Basis of Payment: This work will be paid for at the contract unit price each for "Drilling Holes and Grouting Dowels," which price shall include drilling and preparing holes, furnishing and installing the

ITEM #0602910A

chemical anchoring material in the holes and all material, equipment, tools and labor incidental thereto.

Reinforcing bars will be paid for under the item “Deformed Steel Bars - Galvanized”.

<u>Pay Item</u>	<u>Pay Unit</u>
Drilling Holes and Grouting Dowels	EA

ITEM #0602910A

ITEM #0603726A - EMBEDDED GALVANIC ANODES

Description: This item includes furnishing all labor, tools, materials, equipment and services necessary to install embedded galvanic anodes within areas of concrete repair or in other locations as shown on the plans.

Materials: The galvanic anodes shall have a cast zinc core meeting the requirements of ASTM B418 Type II (Z13000) and shall be one of the following:

1. Vector Corrosion Technologies, Inc.
Galvashield XP4
8413 Laurel Fair Circle, Suite 200A
Tampa, FL 33610
Tel: (813) 830-7566
Website: www.vector-corrosion.com

2. Sika Corporation
Sika FerroGard - 675
201 Polito Avenue
Lyndurst, NJ 07071
Tel: (800)-933-7452
Website: www.sikaconstruction.com

3. BASF Corporation
Master Builders Solutions – MASTERPROTECT 8160CP
889 Valley Park Drive
Shakopee, MN 55379
Tel: (800)-243-6739
Website: www.basf.com

4. Euclid Chemical Company
Sentinel Gold
19215 Redwood Road
Cleveland, OH 44110
Tel: (800)-321-7628
Website: www.euclidchemical.com

A Materials Certificate shall be submitted to the Engineer in accordance with 1.06.07 that certifies the anode as one of the listed products above.

Construction Methods:**Submittals:**

The following information shall be submitted to the Engineer:

- The Manufacturer and product name, written instructions, including Manufacturer limitations on time during which anodes may be submersed in water as the substrate of the repair area is saturated.
- NACE CP2 Cathodic Protection Technician Certification of the Qualified Technical Representative (QTR). The Qualified Technical Representative supplied by the anode manufacturer shall hold and maintain such certification throughout the project.

Installation:

A minimum of two (2) weeks in advance of the scheduled installation of the anodes, the Contractor shall arrange for a Qualified Technical Representative (QTR) to train the employees of the Contractor and Department. The QTR shall review the plans and tailor the training to address specific details of the project. Training shall also include inspection procedures to detect different reinforcing bar configurations, installation procedures, quality control procedures, and documentation. The QTR shall be present to provide direction until the Contractor becomes proficient in the work to the satisfaction of the Engineer. The QTR shall also be available for consultation at such additional times during the work as requested by the Engineer.

In addition to the Contract documents, the work for this item shall be performed as directed by the Engineer, in accordance with the Manufacturer's recommendations and written instructions, and recommendations of the QTR.

Should the Engineer determine that the reinforcing steel size and spacing differs from the expected reinforcing layout, the Engineer will direct the Contractor regarding placement of anodes. The actual reinforcing bar density may be obtained by entering the bar size and spacing in the "Table of Reinforcing Steel Density Ratios" in the Appendix. Anode spacing shall not exceed that shown in the Appendix. Any spacing deviations shall allow for sufficient clearance around the anodes to allow concrete to encase the anode and be properly consolidated.

Reinforcing steel shall be clean and securely fastened together with tie wires to provide electrical connectivity. The Contractor shall secure the galvanic anodes to the reinforcing bars along the edge of the repair as shown on the plans, using the anode tie wires. The tie wires shall be wrapped around the cleaned reinforcing steel and twisted tightly to allow little or no free movement and to allow concrete to encase the anode. The Contractor shall place the anodes along a single bar or at the intersection between two bars. In addition, the Contractor shall place the anodes to provide two (2) inches of cover between the proposed form and the anodes. *[Note: this is to prevent the finished patch from sounding hollow when hammer-tapped.]* If less cover will result due to shallow bar location, additional localized removal of concrete may be required to place the anode behind the bar.

The Contractor shall test the connections between anodes and reinforcing steel for electrical continuity, as instructed by the QTR. The Contractor shall place additional tie wires or re-tie connections as directed to provide the specified continuity. The Contractor’s testing shall:

- Confirm electrical connection between anode tie wire and reinforcing steel by measuring DC resistance in ohms (Ω) or potential (mV). Electrical connection is acceptable if the DC resistance measured is less than 1 Ω or the DC potential is less than 1 mV.
- Confirm electrical continuity of the exposed reinforcing steel within the repair area. Electrical continuity between test areas is acceptable if the DC resistance is less than 1 Ω or the potential is less than 1 mV.

The Contractor shall install anodes and concrete following preparation and cleaning of the steel reinforcement to ensure proper connectivity of the anodes. If significant surface rust forms before the concrete is placed, the bar must be re-cleaned and the anode-to-steel and bar-to-bar connectivity shall be re-verified and corrected as necessary.

Once anodes are installed, precautions shall be taken to prevent water from soaking the anodes prior to concrete placement. The substrate shall be saturated immediately prior to concrete placement, however, the anodes shall not be immersed longer than recommended by the Manufacturer.

Method of Measurement: This work will be measured for payment by the number of anodes installed and accepted.

Basis of Payment: This work will be paid for at the Contract unit price each for “Embedded Galvanic Anodes,” complete and accepted in place, which price shall include all applicable materials, equipment, tools, and labor incidental thereto. All services of a QTR, and testing of installed anodes are included in the Contract unit price.

The concrete and concrete removal will be paid under a separate item(s).

Pay Item	Pay Unit
Embedded Galvanic Anodes	ea.

APPENDIX TO ITEM #0603726A – EMBEDDED GALVANIC ANODES

MAXIMUM ANODE SPACING Based on 160g Zinc Mass	
Steel Density Ratio	Maximum Anode Spacing (Inches)
< 0.31	24
0.31 - 0.60	20
0.61 - 0.90	16
0.91 - 1.20	14
1.21 - 1.50	10
1.51 - 1.80	8
1.81 - 2.10	6

Enter the left column in the table above with the Steel Density Ratio from TABLE OF REINFORCING STEEL DENSITY RATIOS below. Select the maximum anode spacing in the right column in the table above.

TABLE OF REINFORCING STEEL DENSITY RATIOS

Bar Size (#)	Spacing (inches)	5				6				7				8				9			
		6	9	12	18	6	9	12	18	6	9	12	18	6	9	12	18	6	9	12	18
5	6	0.65	0.55	0.49	0.44	0.72	0.59	0.52	0.46	0.79	0.63	0.56	0.48	0.85	0.68	0.59	0.50	0.92	0.72	0.62	0.52
	9	0.55	0.44	0.38	0.33	0.61	0.48	0.41	0.35	0.68	0.52	0.45	0.37	0.74	0.57	0.48	0.39	0.81	0.61	0.51	0.41
	12	0.49	0.38	0.33	0.27	0.56	0.43	0.36	0.29	0.62	0.47	0.39	0.32	0.69	0.51	0.43	0.34	0.75	0.56	0.46	0.36
	18	0.44	0.33	0.27	0.22	0.50	0.37	0.31	0.24	0.57	0.41	0.34	0.26	0.63	0.46	0.37	0.28	0.70	0.50	0.40	0.31
6	6	0.72	0.61	0.56	0.50	0.79	0.65	0.59	0.52	0.85	0.70	0.62	0.55	0.92	0.74	0.65	0.57	0.98	0.79	0.69	0.59
	9	0.59	0.48	0.43	0.37	0.65	0.52	0.46	0.39	0.72	0.57	0.49	0.41	0.79	0.61	0.52	0.44	0.85	0.65	0.56	0.46
	12	0.52	0.41	0.36	0.31	0.59	0.46	0.39	0.33	0.65	0.50	0.43	0.35	0.72	0.55	0.46	0.37	0.79	0.59	0.49	0.39
	18	0.46	0.35	0.29	0.24	0.52	0.39	0.33	0.26	0.59	0.44	0.36	0.28	0.65	0.48	0.39	0.31	0.72	0.52	0.43	0.33
7	6	0.79	0.68	0.62	0.57	0.85	0.72	0.65	0.59	0.92	0.76	0.69	0.61	0.98	0.81	0.72	0.63	1.05	0.85	0.75	0.65
	9	0.63	0.52	0.47	0.41	0.70	0.57	0.50	0.44	0.76	0.61	0.53	0.46	0.83	0.65	0.57	0.48	0.89	0.70	0.60	0.50
	12	0.56	0.45	0.39	0.34	0.62	0.49	0.43	0.36	0.69	0.53	0.46	0.38	0.75	0.58	0.49	0.40	0.82	0.62	0.52	0.43
	18	0.48	0.37	0.32	0.26	0.55	0.41	0.35	0.28	0.61	0.46	0.38	0.31	0.68	0.50	0.41	0.33	0.74	0.55	0.45	0.35
8	6	0.85	0.74	0.69	0.63	0.92	0.79	0.72	0.65	0.98	0.83	0.75	0.68	1.05	0.87	0.79	0.70	1.11	0.92	0.82	0.72
	9	0.68	0.57	0.51	0.46	0.74	0.61	0.55	0.48	0.81	0.65	0.58	0.50	0.87	0.70	0.61	0.52	0.94	0.74	0.64	0.55
	12	0.59	0.48	0.43	0.37	0.65	0.52	0.46	0.39	0.72	0.57	0.49	0.41	0.79	0.61	0.52	0.44	0.85	0.65	0.56	0.46
	18	0.50	0.39	0.34	0.28	0.57	0.44	0.37	0.31	0.63	0.48	0.40	0.33	0.70	0.52	0.44	0.35	0.76	0.57	0.47	0.37
9	6	0.92	0.81	0.75	0.70	0.98	0.85	0.79	0.72	1.05	0.89	0.82	0.74	1.11	0.94	0.85	0.76	1.18	0.98	0.88	0.79
	9	0.72	0.61	0.56	0.50	0.79	0.65	0.59	0.52	0.85	0.70	0.62	0.55	0.92	0.74	0.65	0.57	0.98	0.79	0.69	0.59
	12	0.62	0.51	0.46	0.40	0.69	0.56	0.49	0.43	0.75	0.60	0.52	0.45	0.82	0.64	0.56	0.47	0.88	0.69	0.59	0.49
	18	0.52	0.41	0.36	0.31	0.59	0.46	0.39	0.33	0.65	0.50	0.43	0.35	0.72	0.55	0.46	0.37	0.79	0.59	0.49	0.39

How to use the Table of Reinforcing Steel Density Ratios:

1. Enter the table with the first bar size and spacing in the top two rows. Identify that column.
2. Enter the bar size and spacing in the transverse direction in the first two columns. Identify that row.
3. Follow the identified column and row to their intersection and read the reinforcing steel density in that cell.
4. Enter the Maximum Anode Spacing Table with the Reinforcing Steel Density to select the maximum anode spacing.

ITEM #0707009A - MEMBRANE WATERPROOFING (COLD LIQUID ELASTOMERIC)

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

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

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

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

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

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

All quality-control testing, including verbal direction or observations on the day of the installation, shall be recorded and submitted to the Engineer for inclusion in the Project's records. A submittal of the quality-control testing data shall be received by project personnel prior to any paving over the finished membrane or within 24 hours following completion of any staged portion of the work.

1. **Applicator Approval:** The Contractor's membrane Applicator shall be fully trained and licensed by the membrane manufacturer and shall have successfully completed at least three spray membrane projects in the past five years. The Contractor shall furnish references from those projects, including names of contact persons and the names, addresses and phone numbers of persons who supervised the projects. This information shall be submitted to the Engineer prior to the start of construction. The Engineer shall have sole authority to determine the adequacy and compliance of the submitted information. Inadequate proof of ability to perform the work will be grounds to reject proposed applicators.

2. **Job Conditions:**

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

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

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

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

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

3. **Delivery, Storage and Handling:**

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

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

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

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

4. Surface Preparation:

- (a) Protection: The Applicator shall be responsible for the protection of equipment and adjacent areas from over spray or other contamination. Parapets and bridge joints shall be masked prior to application of the materials.
- (b) Surface Preparation: Sharp peaks and discontinuities shall be ground smooth. The surface profile of the prepared substrate is not to exceed 1/4 inch (peak to valley) and areas of minor surface deterioration of 1/2 inch and greater in depth shall also be repaired. The extent and location of the surface patches require the approval of the Engineer before the membrane system is applied.

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

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

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

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

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

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

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

- (b) Random tests for adequate tensile bond strength shall be conducted on the substrate using an adhesion tester in accordance with the requirements of ASTM D4541. The minimum frequency shall be one test per 5,000 s.f. but not less than three adhesion tests per bridge.

Adequate surface preparation will be indicated by tensile bond strengths of primer to the substrate greater than or equal to 150 psi or failure in a concrete surface and greater than or equal to 300 psi for steel surfaces.

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

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

6. Application:

- (a) The System shall be applied in four distinct steps as follows:
 - 1) Substrate preparation and gap/joint bridging preparation
 - 2) Priming
 - 3) Membrane application
 - 4) Membrane with aggregate
- (b) Immediately prior to the application of any components of the System, the surface shall be dry (see Section 5a of this specification) and any remaining dust or loose particles shall be removed using clean, dry oil-free compressed air or industrial vacuum.
- (c) Where the area to be treated is bound by a vertical surface (e.g. curb or wall), the membrane system may be continued up the vertical, as shown on the plans or as directed by the Engineer.
- (d) The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results, in accordance with the Manufacturer's recommendations or as approved or directed by the Engineer.
- (e) A neat finish with well defined boundaries and straight edges shall be provided by the Applicator.
- (f) Primer: The primer shall consist of one coat with an overall coverage rate of 125 to 175 s.f./gal unless otherwise recommended in the manufacturer's written instructions.

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

The primer shall be spray applied using a single component spray system approved for use by the Manufacturer. If required by site conditions and allowed by the manufacturer, brush or roller application will be allowed.

The primer shall be allowed to cure tack-free for a minimum of 30 minutes or as required by the Manufacturer's instructions, whichever time is greater, prior to application of the first lift of waterproofing membrane.

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

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

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

The substrate shall be coated in a methodical manner.

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

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

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

Repair the membrane system following destructive testing and correct any deficiencies in the membrane system or substrate noted during quality-control testing in accordance with the manufacturer's recommendations to the satisfaction of the Engineer at no additional cost to the State.

- (h) Repairs: If an area is left untreated or the membrane becomes damaged, a patch repair shall be carried out to restore the integrity of the system. The damaged areas shall be cut back to sound materials and wiped with solvent (e.g. acetone) up to a width of at least four inches on the periphery, removing any contaminants unless otherwise recommended by the manufacturer. The substrate shall be primed as necessary, followed by the membrane. A continuous layer shall be obtained over the substrate with a four inches overlap onto existing membrane.

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

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

Prior to application of a bituminous concrete overlay, the aggregated finish shall be coated with a bonding material. The bonding material shall be per the membrane waterproofing manufacturer’s recommendations.
7. Final Review: The Engineer and the Applicator shall jointly review the area(s) over which the completed System has been installed. Any irregularities or other items that do not meet the requirements of the Engineer shall be addressed at this time.

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

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

<u>Pay Item</u>	<u>Pay Unit</u>
Membrane Waterproofing (Cold Liquid Elastomeric)	s.y.

ITEM #0819002A - PENETRATING SEALER PROTECTIVE COMPOUND

Description: Work under this item shall consist of cleaning concrete surfaces of dirt, dust and debris, and furnishing and applying a clear, penetrating sealer where shown on the plans, to provide a hydrophobic barrier against the intrusion of moisture. This work also includes furnishing, installing and removing platforms, scaffolding, ladders and other means of access as well as shields, as required, to protect adjacent areas from overspray. Penetrating sealer shall not be applied to concrete surfaces that have been previously treated with coatings or curing compounds that would hinder penetration of the sealer into the concrete.

Materials: The penetrating sealer shall be a single component, 100% silane or silane siloxane from the list of materials below. The material shall be selected in anticipation of the expected ambient and surface temperature at the time of installation.

The following products may be used when ambient and surface temperatures are 40°F and above:

SIL-ACT ATS-100 (Silane)
Advanced Chemical Technologies, Inc.
9608 North Robinson Ave.
Oklahoma City, OK 73114
405-843-2585
www.advchemtech.com

Armor SX 5000 EXT-100 or SX 5000 WB (Silane Siloxane)
Foundation Armor, LLC.
472 Amherst St. STE 14
Nashua, NH 03063
866-306-0246
www.foundationarmor.com

Aquinil Plus 100 (Silane)
ChemMasters
300 Edwards Street
Madison, OH 44057
440-428-2105, 800-486-7866
www.chemmasters.net/Aquanil100.php

The following product may be used when ambient and surface temperatures are 20°F and above:

Certi-Vex Penseal 244 100% (Silane)
Vexcon Chemicals
7240 State Road
Philadelphia, PA 19135
888-839-2661
www.Vexcon.com

Construction Methods:

Submittals: The Contractor shall submit to the Engineer Safety Data Sheets (SDS) and product literature for the selected product. The literature shall include written instructions how to apply the product to vertical and horizontal surfaces, and where required, overhead surfaces.

The Contractor shall submit to the Engineer, in accordance with Article 1.05.02, written procedures for cleaning the concrete surfaces. The submittal shall include proposed equipment and materials and shall address how adjacent traffic and other areas shall be protected from dust, debris and overspray during the cleaning and application processes. Where the sealer is to be applied to parapets before pavement is placed, the submittal shall address protecting the deck and curb to which membrane waterproofing will be applied. Should the membrane already be present, the submittal shall address protecting the membrane. It shall also indicate how vegetation shall be protected from overspray. The submittal shall address the conditions under which work may proceed, including wind speed, temperature and precipitation. It shall also include procedures to be followed to protect the work should unfavorable weather conditions occur before the product has been absorbed.

The Contractor shall inspect the surfaces to be sealed to identify surface cleaning needs before submitting the procedures. The Contractor shall identify conditions that need repair or surfaces that may require special attention or cleaning procedures. Such observations shall be addressed in the written procedures.

Surface Preparation: Concrete surfaces to which penetrating sealer will be applied shall be dry, clean and free of grease, oil and other surface contaminants. New concrete and newly placed repair concrete shall be allowed to cure for at least 28 days before applying sealer. After rain or water cleaning, allow existing concrete surfaces to dry for at least 8 hours before applying sealer. Dry surfaces may be cleaned by sweeping with brushes or brooms, and blowing clean with oil-free, compressed air. The Contractor shall take care not to damage the concrete surface finish during cleaning operations. Care shall be taken so that cleaning methods do not damage joint sealant or other components of the structure.

Application: Application of the sealer can only begin after the Engineer evaluates the concrete surfaces for cleanliness and moisture, and determines that conditions are appropriate for application.

The sealer shall saturate the concrete surface with a rate of application of 200 square feet per gallon of sealer. The dispersion shall run six to eight inches down a vertical surface from the spray pattern. The maximum run-down is 12 inches. The Contractor shall monitor and record the number of square feet per gallon of sealer used to verify that the required application rate is being met. Additional sealer may be needed if surfaces are porous, rough or textured.

The Engineer will inspect the concrete surface during application and after the sealer has had adequate time to penetrate. As a test, water sprayed from a bottle on the sealed surface shall bead up and not be absorbed. Should water be absorbed into the concrete at a test area, additional areas shall be tested to determine which areas should receive additional application of sealer. The

Contractor shall apply additional sealer to the identified areas until absorption of water is prevented.

Method of Measurement: This work will be measured for payment by the actual number of square yards of concrete, coated completely and accepted, within the designated limits. The area will be measured once, regardless of the number of applications required.

Basis of Payment: This work will be paid for at the Contract unit price per square yard for “Penetrating Sealer Protective Compound,” complete, which price shall include all equipment tools, labor and materials, incidental thereto, including the preparation of the concrete surfaces and proper disposal of debris.

Pay Item	Pay Unit
Penetrating Sealer Protective Compound	s.y.

ITEM #0821189A – CONCRETE BARRIER TRANSITION SECTION

Description: Under this item, the Contractor shall furnish and install concrete barrier transition section in the locations shown on the plans, or as directed by the Engineer.

Materials: Materials for the above items shall conform to all the requirements of Section 8.21.02

Construction Methods: The contract items listed above may be precast and follow the methods of Article 8.21.03 or cast-in-place in accordance with Article 6.01.03. The items shall be coated with a penetrating sealer protective compound that meets the requirements of Article M.03.09 and Item No. 0819002A Penetrating sealer protective compound.

Method of Measurement:

1. The Concrete Barrier Transition Section will be measured for payment along the centerline of the top of the item being measured and will be the actual number of linear feet of the item installed and accepted.

Basis of Payment:

1. The work for "Concrete Barrier Transition Section," will be paid for at the contract unit price per linear foot of the size specified, complete in place, which price shall include all backfill, sand backfill, materials, reinforcing steel, penetrating sealer protective compound, transportation, equipment, tools and labor incidental thereto.

Pay Item
Concrete Barrier Transition Section

Pay Unit
L.F.

ITEM #0821189A

ITEM #0822005A – TEMPORARY PRECAST CONCRETE BARRIER CURB (STRUCTURE)

ITEM #0822006A – RELOCATED TEMPORARY PRECAST CONCRETE BARRIER CURB (STRUCTURE)

Description:

Work under this item shall consist of furnishing, installing, relocating and removing temporary concrete barrier for use on structures as shown on the plans.

Materials:

1. The barrier shall be precast concrete conforming to Article 8.21.02-1.
2. Manufacturer identification and casting date shall be permanently marked on each barrier unit by means of a non-corrosive metal or plastic tag in the location shown on the plan. When used barrier is furnished, the Contractor shall provide documentation stating from where the material came, what project it will be used on, the casting dates, and certification that the barrier conforms to all State requirements.
3. Reinforcing steel shall conform to the requirements of ASTM A615M, Grade 60.
4. Lifting hooks. Keys, bolts, devices and attachments shall be of the size indicated on the plans or of a design satisfactory for the purpose intended as approved by the Engineer.
5. Anchor bolts shall conform to ASTM A307. Heavy hex nuts shall conform to AASHTO M291. The plate washers shall conform to AASHTO M232M, Grade 50. The anchor bolts, nuts, and plate washers shall be hot-dipped galvanized in accordance with ASHTO M232 and M111 as applicable.
6. Loop bars shall be bent from smooth bar steel conforming to AISI 1018 (hot rolled). Ends shall be hot-dipped galvanized in accordance with AASHTO M111.
7. Threaded connection rods shall be steel conforming to AASHTO M314 (ASTM F1554). Grade 55 except that threads and nominal diameters shall conform to ANSI B1.13M for Class 6g threads. The rod shall be threaded for a minimum of 4 inch at each end. Plain steel washers shall be manufactured in accordance with ANSI B18.22M. Heavy hex nuts shall conform to AASHTO M 291M for Class 10S and shall conform to the geometry defined in ANSI B18.2.4.6M. The threaded connection rods, washers, and nuts shall be hot-dipped galvanized after fabrication in accordance with the requirements of Class C of AASHTO M232.
8. The chemical anchor material shall be a resin compound specially formulated to secure bolts in concrete against tension pull-out. The Contractor shall select the chemical anchor material in accordance with Article M.03.07.
9. Non-shrink grout shall conform to subarticle M.03.05.
10. Barrier shall be accepted on the basis of the manufacturer's certification, as defined on Article M.08.02-4.
11. Sealant for patching holes in bituminous overlays shall be a cold-applied bituminous sealer conforming to M.08.01-15.

12. Anchor Bolts/Threaded Connection Rods-Certified Test Reports: The Contractor shall submit a Certified Test Report and a Materials Certificate in conformance with Article 1.06.07 and a sample of all anchor bolts, threaded connection rods, nuts, and washers for testing prior to their installation.
The Contractor shall not install any anchor bolts or threaded connection rods, prior to receipt of the approved test results and approval by the Engineer.
13. Delineators shall conform to Article 8.22.02.

Construction Methods:

1. Fabrication: The barrier shall be precast concrete in conformance with the pertinent requirements of Article 8.21.03 and the plans, except that penetrating sealer protective compound is not required.
2. Installation: The barrier shall be placed as shown on the plans or as directed by the Engineer.

The barriers shall be anchored to the concrete deck slab in accordance with the plans and the following:

- a. Chemical Anchoring: This consists of drilling holes in concrete deck slabs, placing anchor bolts in the holes, and securing the bolts with a pre-approved chemical anchor material.

The Contractor shall submit the following to the Engineer for approval type of drill, diameter of bit, method of cleaning. Holes and method of placement of chemical anchor material. Specifications and recommendations for the aforementioned may be obtained from the manufacturer of the chemical anchor material.

Drilling methods shall not cause spalling, cracking, or other damage to the concrete. Those areas damaged by the Contractor shall be repaired by him in a manner suitable to the Engineer and at no expense to the State.

Care shall be taken not to drill holes into or through structural steel. The Contractor shall take the necessary precautions to prevent materials from falling into the brook below.

When reinforcing steel is encountered during the drilling of the holes, the Contractor shall attempt to angle the hole to by-pass the bar.

The holes shall be blown clean and wire brushed or otherwise cleaned per the manufacturer's written instructions prior to setting the anchor bolts.

The anchor bolts shall extend to the bottom of the holes and be hammer taped to insure full penetration. The chemical anchor material shall be installed in

accordance with the written directions supplied by manufacturer of the chemical anchor material.

The barrier shall be anchored down by torquing the bolts "snug tight", which is defined as the tightness attained after several impacts from an impact wrench. No part of the bolt head shall project above the outer surface of the barrier.

- b. Through-Bolting: This consists of drilling completely through the deck slab and securing anchor bolts on the underside with plate washers and nuts. Through-Bolting is not permitted on new construction or prestressed concrete. Measures shall be taken to insure that no damage occurs to property below the bridge.
 - c. Care shall be taken not to drill holes into or through structural steel. The barrier shall be anchored down by torquing the bolts 'snug tight", which is defined as the tightness attained after several impacts from an impact wrench. No part of the bolt head shall project above the outer surface of the barrier.
3. Connection of Barrier Units: The barrier shall be joined together with threaded connection rods, and heavy hex nuts in accordance with the plans.
 4. Cutting of Anchor Bolts: Where ordered by the Engineer, protruding anchor bolts shall be cut off flush with the surface of the concrete deck. The bolts shall then be ground down below the surface of the deck and the space filled in with non-shrink grout.
 5. Patching with Non-Shrink Grout: After removal of the barrier, holes in newly constructed concrete decks and threaded inserts shall be blown clean with an air jet and filled in with non-shrink grout. The non-shrink grout shall be mixed and placed in strict accordance with the manufacturer's directions. The non-shrink grout shall be finished flush with the deck surface. Allow grout to cure a minimum of 24 hours before placing sealant in any remaining hole in the bituminous wearing surface.
 6. Delineators: Delineators shall be installed on top of the barrier in accordance with Article 8.22.03-3 and the plans.
 7. General: The barrier shall be kept in good condition at all times by the Contractor during all stages of construction. Any damaged material shall be replaced by the Contractor at his expense.

When the barrier is no longer required, it shall be removed from the work site and become the property of the Contractor.

Method of Measurement:

Temporary Precast Concrete Barrier Curb (Structure) and Relocated Temporary Precast Concrete Barrier Curb (Structure) will be measured for payment along the centerline at the top of the barrier and will be the actual number of linear feet of temporary structure barrier furnished, installed, and accepted.

Relocation of concrete barrier for access to the work area or for the convenience of the contractor will not be measured for payment. Movement of stored barrier or maintenance of the storage area will not be measured for payment.

Delineators will be measured in accordance with Article 12.05.04.

Basis of Payment:

This work will be paid for at the contract unit price per linear foot for "Temporary Precast Concrete Barrier Curb (Structure)" and "Relocated Temporary Precast Concrete Barrier Curb (Structure)", complete in place, which price shall include all furnishing, transportation, initial installation, relocation, final removal, storage, materials, reinforcing steel, connection rods, and all equipment, tools, and labor incidental thereto. The cost of furnishing, installing, and cutting of anchor bolts shall also be included for payment under this item. Each Temporary Precast Concrete Barrier Curb (Structure) will be paid for once regardless of the number of times it is used on the project. Any barrier units that become lost, damaged or defaced shall be replaced by the Contractor at no cost to the State.

<u>Pay Item</u>	<u>Pay Unit</u>
Temporary Precast Concrete Barrier Curb (Structure)	l.f.
Relocated Temporary Precast Concrete Barrier Curb (Structure)	l.f.

ITEM #0822042A - TEMPORARY GLARE SCREEN MODULAR UNITS

ITEM #0822043A – RELOCATED TEMPORARY GLARE SCREEN MODULAR UNITS

Description:

This item shall consist of furnishing and installing a glare screen consisting of modular units with blades spaced as recommended by the manufacturer on Concrete Barrier Curb at locations as shown on the plans or as directed by the Engineer. This item shall also include relocating, removing and maintaining temporary glare screen. The glare screen shall be used during stages of construction as indicated on the plans or as directed by the Engineer.

Materials:

The glare screen units shall be modular units consisting of vertical blades and a horizontal base rail. The modular units shall be manufactured and assembled in various lengths, so the cumulative nominal length of the modular units shall equal the length of the individual sections of concrete barrier curb, so that the joint between barrier sections will not be spanned by any one unit.

The glare screen system shall be manufactured from durable impact resistant, non-warping, non-metallic polymeric materials.

Glare screen blades shall be 6” to 9” in width, green in color and have a length of 30”.

Construction Methods:

Every 40 feet a modular blade shall have a 3”x3” piece of Type V or Bright Wide Angle reflective sheeting. (Yellow on the left side of the travelway and white on the right side of the travelway). The center of the marker shall be 48 inches above the base of the Concrete Barrier Curb. The attachment of the modular units to the concrete barrier curb sections shall be as specified by the manufacturer. The modular units shall be installed so that the joint between barrier sections will not be spanned by any one unit.

The temporary modular glare screen shall be maintained by the Contractor during all stages of construction. Any damaged material shall be removed and replaced by the Contractor at its expense.

The Contractor shall relocate the temporary modular glare screen and its appurtenances to the locations within the project limits as shown on the plans or as ordered by the Engineer. When the temporary modular glare screen is no longer required, it will be removed from the project and become the property of the Contractor.

Method of Measurement:

This item will be measured for payment by the actual number of linear feet of temporary modular glare screen in use at any one time of the size and color specified, furnished, installed, and accepted.

Relocated temporary modular glare screen will be measured by the actual number of linear feet relocated each time the screen has been satisfactorily relocated as directed by the Engineer, including to and from the storage area. Storage of temporary modular glare screen will not be measured for payment.

Basis of Payment:

This work will be paid for at the contract unit price per linear foot for “Temporary Glare Screen Modular Units” complete in place, which price shall include all furnishings, transportation, initial installation, final removal, storage, materials, disposal of the units and yellow or white reflective tape marker and all materials, equipment, tools, and labor incidental thereto.

The relocation of the temporary modular glare screen will be paid for at the contract unit price per linear foot for “Relocated Temporary Glare Screen Modular Units” which price shall include all transportation, temporary storage, relocation, materials, equipment, tools, and labor incidental thereto.

Pay Item

Temporary Glare Screen Modular Units

Relocated Temporary Glare Screen Modular Units

Pay Unit

L.F.

L.F.

ITEM #0822072A — TEMPORARY PRECAST CONCRETE BARRIER CURB (PINNED)

ITEM #0822073A — RELOCATED TEMPORARY PRECAST CONCRETE BARRIER CURB (PINNED)

Description:

Work under this item shall consist of furnishing, installing, relocating, and removing pinned temporary concrete barrier for use on roadways to separate traffic from opposing traffic or work areas. Pinned barriers shall be used at roadway locations where construction phase conditions warrant a barrier system with greater resistance to lateral dynamic deflection than provided by a non-pinned barrier system, with the locations or warrants identified in the plans.

Materials:

1. The barrier shall be precast concrete conforming to Article 8.21.02-1-7.
2. Pins and plate washers shall be ASTM F152, Grade 36 and shall be hot dip galvanized after fabrication, in accordance with ASTM A153. All materials shall conform to the requirements of Article M.06.02.
3. Loop bars shall conform to Article 8.22.02.
4. Threaded connection rods shall conform to Article 8.22.02
5. Non-shrink grout shall conform to Article M.03.05.
6. Barrier shall be accepted on the basis of the manufacturer's certification, as defined in Article M.08.02.
7. Anchor pins and plate washers: The Contractor shall submit a Certified Test Report and a Materials Certificate in conformance with Article 1.06.07 and a sample of all anchor pins and plate washers for testing prior to their installation. The Contractor shall not install any anchor pins prior to receipt of the approved test results and approval by the Engineer.
8. Delineators shall conform to Article M.18.07.

Construction Methods:

1. Fabrication: The barrier shall be precast concrete in conformance with the pertinent requirements of Article 8.21.03 and the plans, except that penetrating sealer protective compound is not required. Welding for the anchor pins shall conform to the requirements of Article 6.03.03.
2. Installation: The barrier shall be placed as shown on the plans or as directed by the Engineer.

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The barriers shall be pinned through the flexible pavement in accordance with the plans and the following:

The Contractor shall drill or core through the bituminous pavement with a hole diameter equal to the diameter of the anchor pin. The pin shall be driven through the drilled hole and into the underlying subbase material until the plate washer is tight to the concrete barrier. No portion of the pin or washer shall protrude beyond the limits of the anchor pocket.

The Contractor shall identify any underground utilities in areas of pinned barrier and shall not install any pins that may damage utilities including drainage systems. If pinned barriers are required at a location with such underground utility present, the Contractor shall notify the Engineer of the potential conflict for a determination on the appropriate installation of the pinned barrier.

3. Connection of Barrier Units: The barrier shall be joined together with threaded connection rods, washers, and heavy hex nuts in accordance with the plans.
4. Removal of Anchor Pins: All anchor pins shall be removed prior to the removal or relocation of barrier sections. Pins shall be pulled with the applied force in a direction aligned with the axis of the pin to minimize damage to the surrounding pavement. Pins damaged during the removal operation shall not be reused by the Contractor unless any damage is repaired in a manner acceptable to the Engineer.
5. Patching Anchor Holes: After removal of the barrier, holes in flexible pavement shall be filled in with non-shrink grout or other suitable material approved by the Engineer. Non-shrink grout shall be mixed and placed in accordance with the manufacturer's directions. The fill material shall be finished flush with the roadway surface.
6. Delineators: Delineators shall be installed on top of the barrier in accordance with Article 8.22.03-3 and the plans.
7. General: The barrier shall be kept in good condition at all times by the Contractor during all stages of construction. Any damaged material shall be replaced by the Contractor at his expense.

When the barrier is no longer required, it shall be removed from the work site and become the property of the Contractor.

8. Relocation of Barrier: If called for on the plans, the Contractor shall relocate the barrier and its appurtenances to locations within the project limits as shown on the plans or as ordered by the Engineer.

Method of Measurement:

Temporary pinned barrier shall be measured for payment along the centerline at the top of the barrier and will be the actual number of linear feet of temporary pinned barrier furnished, installed, and accepted.

Relocated temporary pinned barrier shall be measured for payment along the centerline at the top of the barrier each time the barrier has been satisfactorily relocated and anchored as indicated on the plans, including to and from the storage area. Storage of the temporary structure barrier will not be measured for payment.

Delineators will be measured in accordance with 12.05.04.

Basis of Payment:

This work shall be paid for at the contract unit price per linear foot for "Temporary Precast Concrete Barrier Curb (Pinned)", complete in place, which price shall include all furnishing, transportation, storage, materials, reinforcing steel, connection rods, anchor pins, initial installation, and final removal; and all equipment, tools, and labor incidental thereto. The cost of patching anchor holes shall also be included for payment under this item. Each temporary pinned barrier will be paid for once regardless of the number of times it is used on the project. Any temporary barrier units that become lost, damaged or defaced shall be replaced by the Contractor at no cost to the State.

The relocation of the temporary pinned barrier will be paid for at the contract unit price per linear foot for "Relocated Temporary Precast Concrete Barrier Curb (Pinned)", which price shall include removing, transporting and re-anchoring the barrier units, and all other materials, equipment, tools, and labor incidental thereto. The cost of furnishing additional anchor pins, and for patching anchor holes shall also be included for payment under this item.

Delineators will be paid for in accordance with Article 12.05.05.

<u>Pay Item</u>	<u>Pay Unit</u>
Temporary Precast Concrete Barrier Curb (Pinned)	LF
Relocated Temporary Precast Concrete Barrier Curb (Pinned)	LF

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ITEM #0824052A - REMOVE EXISTING CONCRETE BARRIER CURB

Description:

This work shall include the removal and satisfactory disposal of existing concrete barrier curb and top rail as shown on the plans.

Construction Methods:

Existing concrete barrier curb and top rail shall be removed to the limits shown on the plans or as ordered by the Engineer.

Method of Measurement:

Existing concrete barrier curb and top rail removed under this item shall be measured for payment by the linear feet of barrier in place before removal. Removal of backfill will be measured for payment under the contract item, "Earth Excavation."

Basis of Payment:

Payment for removing existing concrete barrier curb will be made at the contract unit price per linear foot for "Remove Existing Concrete Barrier Curb," which price shall include all equipment, tools and labor incidental to the removal of the barrier, top rail and the disposal thereof as directed by the Engineer.

<u>Pay Item</u>	<u>Pay Unit</u>
Remove Existing Concrete Barrier Curb	l.f.

ITEM #0913960A - PROTECTIVE FENCE – CHAIN LINK (BRIDGE)

Description: Work under this item consists of furnishing and installing chain link fencing in accordance with the details shown on the plans and with these specifications.

Materials:

Fabric: Wire Fencing shall consist of chain link woven wire and shall be constructed of 9-gauge wire. The wire shall be woven to form a continuous fabric with 1-inch openings. Fabric shall have knuckled finish on both top and bottom edges. Wire fabric shall be Polyvinyl chloride-coated meeting the requirements of ASTM F1664.

Posts and Rails: Posts and rails shall be straight, true to section, and meet the requirements of ASTM A500 Grade B. The Contractor shall provide a Materials Certificate in accordance with Section 1.06.07 for all posts, rails, braces, anchors, plates, and other devices with coating, which shall meet the minimum requirements stated below:

Polyvinyl chloride-coated materials shall be made of steel and have all surfaces galvanized with the outside galvanized surface coated with the same polyvinyl chloride coating as the wire fabric.

Fittings: Fittings shall be malleable iron, pressed steel, or aluminum alloy. All fittings shall be polyvinyl chloride-coated matching the coating on the wire fencing fabric.

Tension Wire, Tie Wire and Hog Rings:

- (a) Tension wire shall be coil spring steel and 6 gauge. The base material shall have a minimum tensile strength of 80 ksi.
- (b) Tie Wire and/or Hog Rings for securing wire fabric to rails or tension wire shall be 9-gauge polyvinyl chloride-coated steel wire matching the coating on the wire fencing fabric.

Base Plates: All base plates shall meet the requirements of ASTM A36. Plates shall have all surfaces galvanized and coated with same polyvinyl chloride coating as the wire fabric.

Leveling Pad: Leveling pads for base plates shall be made of neoprene either cut from sheet stock or cast in molds under pressure and heat. Adhesive used to bond leveling pad to concrete and/or steel shall be an approved type and shall be a controlled setting adhesive made of such materials that are compatible with the leveling pads, steel, and concrete. The adhesive shall be a 2-component, contact, long-lasting, high bond strength material and shall be an air curing adhesive meeting the following requirements:

Tensile Strength, min, psi	1800	ASTM D412
Elongation before breaking, min., %	750	ASTM D412
Brookfield Viscosity @ 77°F, #2 Spindle @ 10 rpm, pascal-seconds	2500 - 3500	ASTM D1084
Average Weight per gallon, pounds	7.60 ±5%	

If the adhesive which is applied to the bonded surfaces requires a primer, the primer shall be supplied by the manufacturer of the adhesive.

Fasteners: Stainless steel cap screws shall meet the requirements of ASTM F5930.

All components of the chain link fence shall be the color black as described in ASTM F934. Coating which exhibits peeling or chipping will be cause for rejection of the shipment.

Construction Methods: The protective fence shall be accurately fabricated and installed in accordance with the plans and as directed by the Engineer.

Place silicone joint sealant around the base of the post to seal against moisture intrusion around the post.

All rails shall be erected to produce a smooth, continuous appearance with posts placed vertically and with all rails parallel to the grade of the parapets. The fabric shall be stretched tightly between end posts and securely fastened with stretcher bar bands. The fabric shall be attached to the rails and line posts as shown on the plans.

Coated fabric, fence posts, rails and fittings shall be handled with care so the coating is not damaged. Damage to the galvanized coating below the finish coating shall be repaired in accordance with ASTM A780 with two coats of brush-applied galvanizing compound before repairing the finish coat. The final dry film thickness of the galvanizing compound shall be a minimum of 2 to 3 mils. Damage to coating shall be repaired as directed by the manufacturer.

Method of Measurement: This work will be measured for payment by the number of linear feet of completed and accepted fence, measured horizontally from centerline to centerline of posts.

Basis of Payment: This work will be paid for at the contract unit price per linear foot for “Protective Fence – Chain Link (Bridge)”, complete and accepted in place, which price includes all materials, equipment, tools and work incidental thereto.

Pay Item

Protective Fence – Chain Link (Bridge)

Pay Unit

L.F.

ITEM #0917010A – REPAIR GUIDERAIL

Description: Work under this item shall consist of the repair of newly installed guiderail. It shall be repaired in the locations originally installed and fabricated in conformity with the lines, designations, dimensions, and details shown on the plans or as ordered by the Engineer.

Materials: The material for guiderail shall meet the requirements as specified within the original applicable contract items.

When repairing guiderail, the Contractor shall reuse any undamaged existing guiderail elements, timber rail, wire rope, appropriate posts, delineators, lap bolts, and other hardware within the project limits as approved by the Engineer to repair the guiderail. The Contractor shall use new materials when any components of the existing railing are damaged or missing and cannot be obtained from other guiderail systems being removed or converted within the Project limits.

Construction Methods: The repair of guiderail shall be in accordance with contraction methods as specified within the original applicable contract items.

Guiderail, including end anchors, which has been installed in final condition and accepted by the Engineer, shall be eligible for reimbursement for repairs subject to the conditions described below. If multiple runs are to be installed in a single stage as indicated in the contract documents, determination for reimbursement shall be made when all runs within the stage are complete and accepted as previously described. On projects without designated stages, guiderail installations must be complete and serving the intended function as determined by the Engineer.

When newly installed guiderail is damaged by public traffic, the following conditions must be satisfied prior to reimbursement for payment;

1. The damage must have been caused solely by the traveling public.
2. The contractor shall provide satisfactory evidence that such damage was caused by public traffic. Such as accident reports obtained from the Connecticut Department of Public Safety, police agencies or insurance companies; statements by reliable, unbiased eyewitnesses; or identification of the vehicle involved in the accident.
3. The contractor shall attempt to collect the costs from the person or persons responsible for the damage and provide documentation of those efforts to the satisfaction of the Engineer.
4. If such evidence cannot be obtained, the Engineer may determine that the damage was not caused by the Contractor and reimbursement for payment is warranted.

This repair provision does not relieve the Contractor of the requirements of Section 1.07, any other contractual requirements for maintenance and protection of traffic and final acceptance and relief of responsibility for the project.

The contractor shall remain responsible for the safety and integrity of the guiderail system for the duration of the project. In the event the guiderail is damaged, the Contractor shall provide sufficient cones, drums and other traffic control devices to provide safe passage by the public. When ordered by the Engineer, the Contractor shall furnish replacement parts and immediately repair the guiderail, but in no case more than 24 hours after notification from the Engineer. In non-emergency situations, the guiderail shall be repaired within 72 hours. The repaired guiderail or anchorages, when completed, shall conform to these specifications for a new system. The Contractor shall be responsible for the removal and the proper disposal of all damaged material and debris.

Method of Measurement: Guiderail damaged solely by the traveling public will be measured for payment. Damage caused by the Contractor's equipment or operations will not be measured for payment.

The sum of money shown on the estimate and in the itemized proposal as "Estimated Cost" for repair of guiderail will be considered the price bid even though payment will be made only for actual work performed. The estimated cost figure is not to be altered in any manner by the bidder. Should the bidder alter the amount shown, the altered figures will be disregarded and the original price will be used to determine the total amount bid for the contract.

Basis of Payment: Repair of guiderail will be paid for in accordance with Article 1.09.04 as required to restore the rail to its full working condition in conformance with these specifications for a new system. There will be no payment for maintenance and protection of traffic for work associated with this item unless, in the opinion of the Engineer, the sole purpose of the maintenance and protection of traffic is for repair of the guiderail.

<u>Pay Item</u>	<u>Pay Unit</u>
Repair Guiderail	est. (est.)

ITEM #0945005A - WILDFLOWER ESTABLISHMENT

Description: The work included in this item shall consist of providing an accepted uniform stand of established wildflowers by furnishing and placing seed and mulch on all areas to be treated as shown on the plans, permits or as directed by the Engineer.

The work will also include the installation of bio-degradable erosion control matting, as shown on plans, permits or as directed by the Engineer, consisting of mulch and netting woven together as a unit.

Materials: All wildflower seed mixture sources shall be locally obtained within the Northeast USA including New England, New York, Pennsylvania, New Jersey, Delaware, or Maryland in order to preserve and enhance the diversity of native wildflower species.

Mulch shall meet the requirements of Article M.13.05.

Bio-degradable erosion control matting, if required, shall be from the Department's Qualified Products List and shall meet the requirements of Article M.13.09.

All seed mixture sources, mulch and erosion control matting shall be approved by Engineer prior to application.

Three approved seed mixtures are detailed below.

1. **New England Wildflower Seed Mix: (NEWP) New England WetMix**, New England Wetland Plants, Inc. 800 Main Street Amherst, MA 01002, or equal. Rate shall be 1 pound PLS per 1900 sq.ft.
2. **XERCES Northeastern Pollinator Mix:** Ernst Conservation Seeds Inc. 8884 Mercer Pike, Meadville, PA, 16335, or equal. Rate shall be 8 pound PLS per 1 acre.
3. **Wildflower & Grass Mix**, Vermont Wetland Plant Supply, LLC, P.O. Box 153, Orwell, VT, 05760, or equal. Rate shall be 1 pound PLS per 1600 sq.ft.

All seed mixtures must be approved by the Environmental Scientist from the Office of Environmental Planning in advance of purchase. The materials certification for any proposed mixture shall be submitted a minimum of thirty (30) days prior to delivery on site by the Contractor. All seed material certifications must have seed mixtures that shall not include any invasive species pursuant to Connecticut General Statute Sec. 22a-381d or any State Threatened or State Endangered species known pursuant to Connecticut General Statute Sec. 26-303 which would be a violation of the Connecticut Endangered Species Act. The seed tags from the bags are to be removed by the Engineer upon delivery and attached to the Material Certification. A copy of the seed tag is to be provided to the Environmental Scientist. No seeding shall occur if the requirements are not met.

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

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

Preparation of Seedbed Areas:

- a. Level areas, median areas, interchanges and lawns: These areas shall be made friable and receptive for seeding by discing or by other approved methods to the satisfaction of the Engineer. The final prepared surface which has been seeded shall meet the lines and grades for such surface areas as shown on the plans, or as directed by the Engineer.
- b. Slope and embankment areas: These areas shall be made friable and receptive to seeding by approved methods which will not disrupt the line and grade of the slope surface. In no event, will seeding be permitted on hard or crusted soil surface.

All areas to be seeded shall be reasonably free from weeds taller than 3 inches. Removal of weed growth for the slope areas shall be those methods which do not rut or scar the slope surface or cause excessive disruption of the slope line or grade as approved by the Engineer. Seeding on level areas shall not be permitted until substantial weed growth is removed and approved by the Engineer.

Seeding Season: The calendar dates for seeding shall be:

Spring – March 1 to June 15

Fall – September 15 to November 15

Seeding Methods: The wildflower seed mixture shall be applied by an agronomically acceptable procedure approved by Environmental Scientist. The rate of application shall be as shown on the plans or directed by the Engineer.

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

The Engineer shall verify that the seed is applied at a rate which will allow for 100 percent PLS.

Method of Measurement: The work will be measured for payment by the number of pounds of each size and kind of wildflower seed counted, planted and accepted.

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

06/12/2017

Pay Item
Wildflower Establishment

Pay Unit
lb.

ITEM #0950010A – TEMPORARY SEEDING

Description: The work included in this item shall consist of measures to control soil erosion through establishment of a temporary stand of grass and/or legumes by seeding and mulching soils that will be exposed for a period greater than 30 days but less than 12 months, or where designated by the Engineer, to temporarily stabilize the soil and reduce damage from wind erosion, water erosion and sedimentation until permanent stabilization can be accomplished. Such areas include but are not limited to stockpiles, excavated areas, embankment areas that are not at finished grade and any other disturbed or unstable areas where the Engineer determines that there is a potential for soil erosion to occur.

Materials: The materials for this work shall conform to the requirements of Article M.13, supplemented as follows.

The species listed below shall be used for temporary seeding. The Contractor shall use this seed or seed mix, or as directed by the Engineer. The Engineer will determine the appropriate seed mix for the rapid establishment of a temporary stand of grass producing effective erosion control based on a number of factors, including, but not limited to, timing of the seeding as it relates to the optimum seeding dates identified in the table, and site- specific conditions at the time that the temporary seeding is required. Preference will be given to perennial rye (*Lolium perenne*), as specified in Subarticle M.13.04 (b), but the use of other species may be required. Annual ryegrass (*Lolium multiflorum*) shall be used in areas where a specialty seed mix (other than the Department's standard Turf Establishment, such as warm season grass mixtures, conservation seed mixtures, or native grass mixtures) is required.

Mulch for seed, including tackifiers and nettings used to anchor mulch, shall be:

- Biodegradable or photo-degradable within 2 years but without substantial degradation over a period of 6 weeks.
- Free from contaminants that pollute the air or waters of the State when properly applied.
- Free of foreign material, coarse stems and any substance toxic to plant growth or which interferes with seed germination
- Capable of being applied evenly such that it provides 90%-95% soil coverage and still adheres to the soil surface, does not slip on slopes when it rains or is watered, does not blow off site, dissipates raindrop splash, holds soil moisture, moderates soil temperatures and does not interfere with seed growth.

Tackifiers shall include, but are not limited to, water soluble materials that cause mulch particles to adhere to one another, generally consisting of either a natural vegetable gum blended with gelling and hardening agents, or a blend of hydrophilic polymers, resins, viscosifiers, sticking aids and gums, but in no case shall emulsified asphalt be used as a tackifier.

1. Preparation of the Seedbed: The Contractor shall loosen the soil to a depth of 3-4 inches with a slightly roughened surface to make the soil bed friable and receptive for seeding by discing or by other approved methods to the satisfaction of the Engineer. Soil surfaces shall be loosened within 48 hours prior to seeding; in no event will seeding be permitted on hard or crusted soil surface.

2. Seeding Season: Temporary seeding is permitted year round, as conditions allow, or as directed by the Engineer. All temporary seeding required outside of the defined "Seeding Season" indicated in Section 9.50.03.2 are defined as "out- of-season" seeding.

3. Seeding Methods: The grass seed shall be applied uniformly by any agronomically acceptable procedure. The rate of application shall be no less than 175 lb./ac. Increase seeding rates by 10% when hydroseeding.

Fertilizer shall be applied at a rate of 300 pounds per acre or 7.5 pounds per 1,000 square feet.

Agricultural ground dolomitic limestone shall be applied at the rates given in the Table below.

Soil Texture vs. Liming Rates

Soil Texture	Tons / Acre of Lime	Lbs. / 1000 sq. ft. of Lime
Clay, clay loam and high organic soil	3.0	135
Sandy loam, loam, silt loam	2.0	90
loamy sand, sand	1.0	45

4. Mulch: All seeding shall include a mulch covering or other protective covering to protect the soil surface on a temporary basis and promote the establishment of temporary seeding. The type of mulch selected shall take into consideration the time of year and conditions and are subject to approval by the Engineer.

Hay mulch covering shall be mechanically applied to a minimum of 2 inches deep and held down with a non-petroleum based tackifier and applied immediately following the application of seed, fertilizer, and limestone.

Wood fiber mulch covering shall be applied in a water slurry at a rate of 2000 pounds per acre with, or immediately after, the application of seed, fertilizer, and limestone.

Mulch shall be spread uniformly by resulting in 90%-95% coverage of the disturbed soil.

All “out-of-season” seeding shall have an additional 2 inch hay mulch covering mechanically applied and held down with a non-petroleum based tackifier and applied immediately following the initial mulch covering. The hay mulch shall be spread uniformly resulting in 95%-100% coverage of the disturbed soil.

The Contractor shall use tackifiers or other mulch anchoring system approved by the Engineer.

5. Maintenance: The Contractor shall inspect the seeded area at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.1 inch or greater for seed and mulch movement and rill erosion until the grasses are firmly established as determined by the Engineer. Where repeat rill erosion has occurred, additional temporary measures shall be implemented to allow for adequate grass establishment. Such additional temporary measures shall include, but not be limited to, temporary erosion control matting and temporary redirection of stormwater, as directed by the Engineer.

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

The Contractor shall cut the seeded area as necessary to maintain a clean and safe environment for the traveling public in conformance to the requirements of **Article 1.07.07—Public Convenience and Safety**.

Method of Measurement: This work will be measured for payment by the number of square yards of surface area actually covered with established grass, as accepted by the Engineer. For the purpose of this specification, grass will be defined as established in areas where live grass growth at least 6 inches in height covers at least 80% of the bare soil temporarily seeded.

Mulch, tackifier, cutting, lime, and fertilizer will not be measured separately for payment.

Basis of Payment: This work will be paid for at the contract unit price per square yard for “Temporary Seeding” which price shall include all seed, mulch, tackifier or other mulch anchoring, lime, fertilizer, cutting, maintenance, and all other materials, equipment, tools, and labor incidental thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
Temporary Seeding	s.y.

ITEM #0952051A – CONTROL AND REMOVAL OF INVASIVE VEGETATION

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

All invasive vegetation listed on the following websites will be subject to eradication:

- Connecticut Invasive Plant Working Group (CIPWG) Invasive Plants Council (http://cipwg.uconn.edu/invasive_plant_list/)
- US Army Corps of Engineers (ACOE) New England District Compensatory Mitigation Guidance Appendix K (http://www.nae.usace.army.mil/portals/74/docs/regulatory/Mitigation/2016_New_England_Compensatory_Mitigation_Guidance.pdf)

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

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

Construction Methods:

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

The IVRP shall include a schedule and outline with the following information:

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

- a. Methods to eradicate specific invasive plant species for the life of the Contract (e.g. mechanical, herbicide, etc.) shall include any initial, intermediate and 1-Year Plant Establishment Period Treatment eradication methods for each plant species
 - b. Types and concentrations of any herbicides to be used, including any adjuvants, SDS sheets, types of tools or machinery to be used
 - c. Schedules showing dates and eradication methods for the initial, intermediate, and 1-Year Plant Establishment Period Treatments. This schedule must take into consideration stage construction, the time period required between herbicide application, and the physical removal of the target species wherever such methodology is employed
- 5) All invasive species are considered controlled materials and are to be taken off-Site to an approved disposal facility. For disposal methods:
- a. Provide address of location, current permits / letters from the town authorizing such activity and a Site map (complete with regulated areas)
 - b. Wood chips from invasive species are not allowed to be stockpiled or reused on-Site
 - c. Wood chipping on-Site will be allowed if temporarily stored in a properly contained enclosure and removed at the end of the treatment cycle
 - d. Invasive plants shall not be buried on-Site
- 6) Proof of CT DEEP licensure for herbicide application
- 7) A description of safety equipment required
- 8) Procedures for handling chemical spills

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

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

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

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

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

Herbicide applications will not be permitted during any rain event or during windy conditions. Broadcast or uncontrolled spray application will not be permitted and care must be taken to avoid contacting non-target native species. If any non-target native species to remain within the Project

limits are inadvertently treated with herbicide and perish, the Contractor will be responsible to replace in-kind species at no cost to the State.

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

The Contractor shall also:

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

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

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

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

If changes are required to the approved IVRP during the life of the Contract, these changes shall be documented by the Contractor and resubmitted to the Engineer for review and approval a minimum of 10 days prior to beginning of the additional work associated with the change. The Contractor shall provide a 10 day work notice to the Engineer prior to proceeding with each treatment.

2. Treatments: The treatment schedule below may be modified based on field conditions at the discretion of the Engineer. The Contractor shall provide a 10 day work notice to the Engineer prior to proceeding with each treatment. In all cases, each treatment must be reviewed once the work is performed, and accepted before payment is made for that treatment stage.

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

Intermediate Treatment(s): Shall be conducted during the optimal growing season between the dates of June 1 and September 30 for invasive species up to and including 10 days prior to plant installation

or at the end of the Project if no landscaping plan is in the Contract. Optimal treatment times may be specific to the species being treated and this must be considered and documented when developing the Invasive Vegetation Removal Plan. Several treatments may be required to treat all species that are present.

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

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

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

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

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

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

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

Pay Item	Pay Unit
Control and Removal of Invasive Vegetation	s.y.

ITEM #0969030A - PROJECT COORDINATOR (MINIMUM BID)

Article 1.05.08 – Schedules and Reports of the Standard Specifications is hereby amended by the following:

Add the following:

Description: Under this item the Contractor shall furnish the services of an administrative employee, entitled the Project Coordinator, for this Project, to coordinate and expedite all phases of the work required for the Project and to ensure that the construction schedule is maintained.

The minimum lump sum bid for this item shall be equal to 0.5% of the Contractor's total bid. Failure of the Contractor to bid at least the minimum amount will result in the Department adjusting the Contractor's bid to include the minimum bid amount for this item.

The Project Coordinator's resume shall be submitted for approval by name, in writing, within seven (7) calendar days of the award of the Contract, and shall not be changed without prior written notice to the Department.

This resume must demonstrate the Project Coordinator is experienced and versatile in the preparation, interpretation and modification of Critical Path Method (CPM) construction schedules. This must include successful completion of at least three (3) construction projects of similar complexity, where they served in a lead scheduling capacity. If the Contractor does not have a person in their company that has these skills, then the Contractor shall engage the services of a Consultant, subject to the approval of the Engineer, for the scheduling work required. If a Consultant is engaged, they shall be present at the first meeting, along with the Project Contractor, prepared to discuss, in detail, the methods and techniques they propose to use. Thereafter, the Project Coordinator or the Consultant responsible for updating the CPM Schedule shall attend all meetings between the Contractor, its Subcontractors, and any other meetings, which will affect the CPM schedule. The Contractor shall prepare CPM Schedules utilizing the latest version of Primavera Project Planner software.

When the Contract is administered under Section 1.20, the following requirement shall also apply:

The Project Coordinator shall have, in addition to the above noted requirements, a minimum of eight (8) years' experience related to commercial/industrial building construction as a Project Coordinator performing duties similar to those required herein. The Project Coordinator shall have knowledge of all trades involved in the construction, including civil/site work, environmental work, concrete work, masonry work, steel work, wood work, electrical work, and mechanical work. Other combinations of experience and education totaling ten (10) years in commercial building construction will be considered subject to the approval of the Engineer.

Computer Software and Printer: The Contractor shall provide the following equipment with all the required maintenance and repairs (to include labor and parts) throughout the Contract life. The Engineer reserves the right to expand or relax the specification to adapt to the software and hardware limitations and availability.

The Contractor shall provide the Engineer with a licensed copy registered in the Department's name of the latest versions of the software listed and maintain customer support services offered by the software producer for the duration of the project. The Contractor shall deliver to the Engineer all supporting documentation for the software and hardware including any instructions or manuals.

Software – Minimum Specification: The Contractor shall provide the Engineer with a licensed copy of the latest version of the Oracle Primavera Contractor – Deluxe Version scheduling software, registered in the Department's name, and maintain the Primavera customer support service contract over the duration of the project.

Printer: An addition printer shall be provided that meets the printer specifications noted under contract item for "Construction Field Office" and is compatible with the software.

The Contractor is responsible for service and repairs to all computer hardware. All repairs must be performed within 24 hours. If the repairs require more than a 24 hours then a replacement must be provided.

Construction Methods: The Project Coordinator shall attend all meetings between the Contractor and the Department, the Contractor and its Subcontractors, and any other meetings that affect the progress of the job. The Project Coordinator shall be knowledgeable of the status of all parts of the work throughout the length of the Contract.

Please delete any reference to Bar Chart under 1.05.08 – Schedule and Reports and replace with the following:

Critical Path Method (CPM)

Please add the following:

Proper relationship between all major activities shall be indicated. Node numbers shall be coded such that the major activities shown on the Critical Path Schedule shall be easily referenced to the Detailed Project Schedule when it is developed. Break down the work covered under each Special Provision, or Division and Section of Article 1.20 of the Standard Specifications, into individual activities required and logically group related activities together within the CPM.

All documents, which require approval by the Department, shall be clearly identified within the schedule. The Department and any outside agency shall be allocated a minimum number of calendar days in accordance with Article 1.20-1.05.02. If Article 1.20 does not apply, then the Department shall be allocated a minimum of thirty (30) calendar days (exclusive of weekends

and holidays) for review and approval of each submittal. Any submittals requiring approval by an outside Agency (ConnDEEP, Coast Guard, Army Corps of Engineers, etc.) shall be allocated a minimum of sixty (60) calendar days. The Department shall not be held responsible for any delay associated with the approval or rejection of any substitution or other revisions proposed by the Contractor.

The schedule shall indicate the logic of the work for the major elements and components of work under the Contract, such as the planned mobilization of plant and equipment, sequences of operations, procurement of materials and equipment, duration of activities, type of relationship, lag time (if any), and such other information as it is necessary to present a clear statement of the intended activities.

The schedules shall consist of a network technique of planning, scheduling and control, shall be a clear statement of the logical sequence of work to be done, and shall be prepared in such a manner that the Contractor's work sequence shall be optimized between early start and late start restraints. The Contractor shall use the same criteria in a consistent manner throughout the term of the project. If, at any time, the Contractor alters logic, original durations, and descriptions, adds activities or activity codes or in any way modifies the Baseline Schedule, they must notify the Engineer of the change, in writing, presenting in detail the reasons for the change. The Engineer reserves the right to approve or reject any such change.

The critical path of the project must be identified on the CPM schedule. The critical path is the longest-duration path through the network. The significance of the critical path is that the activities that lie on it cannot be delayed without delaying the project. Because of its impact on the entire project, critical path analysis is an important aspect of project planning.

The critical path can be identified by determining the following four parameters for each activity:

1. ES - Earliest Start Time: the earliest time at which the activity can start given that its precedent activities must be completed first.
2. EF - Earliest Finish Time: equal to the earliest start time for the activity plus the time required to complete the activity.
3. LF - Latest Finish Time: the latest time at which the activity can be completed without delaying the project.
4. LS - Latest Start Time: equal to the latest finish time minus the time required to complete the activity.

The *float time* for an activity is the time between its earliest and latest start time, or between its earliest and latest finish time. Float is the amount of time that an activity can be delayed past its earliest start or earliest finish without delaying the project. Delays to activities on the critical path through the project network in which no float exists, that is, where $ES=LS$ and $EF=LF$ will delay the project.

Float available in the schedule, at any time shall not be considered for the exclusive use of either the Department or the Contractor. During the course of Contract, any float generated due to the efficiencies of either party is not for the sole use of the party generating the float; rather it is a shared commodity to be reasonably used by either party. Project float will be a resource available to both the Department and the Contractor.

Each CPM Schedule submittal shall be in the form of an activity on node diagram (precedence diagramming method) and shall include at a minimum; an Early Start computer sort, a Total Float computer sort, an Activity Number computer sort, a Schedule Diagram in the Time Scaled Logic format and a backup data CD-ROM which includes all Primavera project files. The diagrams may be requested printed out by the Department and shall be on 22" x 34" sheets. Additional, more detailed diagrams for important aspects or phases of the work may be required on large or complex projects.

Activity I.D. numbers shall be keyed to the item numbers assigned on the detailed estimate sheet. The first three digits (four digits for highway illumination, signing, traffic signals and utility work) of the activity I.D. number shall be identical to the first three digits of the item number in the Contract. The remaining digits may be used to provide unique, orderly and sequential I.D. numbers for each activity.

Activity codes shall be added to the schedule dictionary at the direction of the Engineer. At a minimum, activity codes for responsibility (prime, subcontractor by name), location of work (bridge #, span #, sta. #, site, building, type of work, etc.) and stage or phase number should be included.

1. Recovery Schedules: If, in the opinion of the Engineer, the updated schedule indicates that the Project has fallen behind schedule, or that a revision in sequence of operations may be necessary for any other reason, absent a justifiable time extension, the Contractor shall immediately institute all necessary steps to improve the Project's progress and shall submit such revised network diagrams, tabulations and operational plans, as may be deemed necessary by the Engineer, to demonstrate the manner in which an acceptable rate of progress will be regained.

Should the Contractor not demonstrate an ability to regain an acceptable rate of progress, the Engineer shall require the schedule to be resource loaded with the next monthly update. No additional compensation will be allowed for resource loading the schedule.

2. As-Built Schedules: Within thirty (30) days of completion of the project, including all corrective work, the Contractor shall submit an "As-Built Schedule" showing the actual progress of work. The Contractor shall submit three prints of this final CPM Schedule and one project backup data CD-ROM which include all Primavera project files for the Engineer's exclusive use.

The following shall also apply to Contracts administered under Section 1.20:

3. **Daily Construction Reports:** The Project Coordinator shall assist the Engineer in the preparation of a daily construction report by ensuring that each of the Contractor's employees and subcontractors working on the Project Site on a given day signs the Engineer's sign-in sheet for that day; and by keeping and providing to the Engineer its own daily list of employees and subcontractors who worked on the Project Site on that day.

Method of Measurement: Within ten (10) calendar days of the award of the Contract, the Contractor shall submit to the Engineer for approval a breakdown of its lump sum bid price for this item detailing:

1. The development cost to prepare the Baseline Schedule in accordance with these specifications. Development costs shall not exceed 25% of the total cost of the item and shall include costs to furnish and install all specified hardware.
2. The cost to provide the services of the Project Coordinator, including costs to prepare and submit the Monthly Updates and Narrative; furnish and submit any Recovery Schedules; furnish and submit Two Week Look Ahead Schedules and maintenance of and supplies for the specified hardware noted above. A per month cost will be derived by taking this cost divided by the number of Contract months remaining from the date of acceptance of the Baseline Schedule.
3. The cost of submission and certification of the As-Built Schedule in accordance with these specifications. The submission and certification costs shall be no less than 2% of the total cost of the item.
4. Substantiation showing that the costs submitted are reasonable based on the Contractor's lump sum bid.

Upon approval of the payment schedule by the Engineer, payments for work performed will be made as follows:

1. Upon approval of the "Baseline" Schedule by the Engineer, the lump sum development cost will be certified for payment.
2. Upon receipt of each monthly narrative and update of the "Baseline" Schedule, the per month cost for the services of the Project Coordinator will be certified for payment.
3. Upon approval of the As-Built Schedule by the Engineer, the lump sum submission and certification cost will be certified for payment.

Basis of Payment: This service will be paid for at the Contract lump sum price for "Project Coordinator" complete, which price shall include the preparation and submission of all schedules, narratives, updates, reports and submittals. The lump sum price shall also include the

cost of providing a complete, licensed copy of the Primavera software which will remain the property of the Engineer, and all materials, equipment, labor and work incidental of this service.

The lump sum price will be certified for payment as described in "Method of Measurement" subject to the following conditions:

1. Any month where the monthly update of the "Baseline" CPM schedule is submitted late, without authorization from the Engineer, will result in the following actions:
 - a. The monthly payment for the Project Coordinator item will be deferred to the next monthly payment estimate. If any monthly submittal is more than thirty (30) calendar days late, there will be no monthly payment for the services of the Project Coordinator.
 - b. The greater of 5% of the monthly payment estimate or \$25,000 will be retained from the monthly payment estimate until such time as the Contractor submits all required reports.
 - c. If in the opinion of the Engineer, the Contractor is not in compliance with this specification, the Engineer may withhold all Contract payments.
2. In the event the Contract time extends beyond the original completion date by more than thirty (30) calendar days, and a time extension is granted to the Contractor, the Department may require additional CPM updates which will be paid for at the per month cost for the services of the Project Coordinator.
3. If the Contractor is not in compliance with this specification or has failed to submit a "Baseline" schedule, monthly update, or a Recovery Schedule for any portion of the work, the Engineer will withhold all Contract payments until the schedule is submitted to, and approved by, the Engineer.

<u>Pay Item</u>	<u>Pay Unit</u>
Project Coordinator	L.S.

ITEM #0969053A - CONTRACTOR QUALITY CONTROL PROGRAM **LEVEL 2**

Description: The Contractor shall establish, maintain, and implement a written Project-specific Quality Control (QC) Program tailored to the complexity and scope of the work. This Program shall detail the programmatic documentation of the Contractor's processes for delivering the level of construction quality required by the Contract.

The written QC Program shall provide a comprehensive description of the planning, monitoring and reporting program the Contractor shall implement to ensure and document the quality of the work as it progresses.

The QC Program shall address, as a minimum, the following elements: Organization; Document Control; Design Control; Procurement Control; Control of Subcontractors, Fabricators and Suppliers; Inspection; Special Process Control; Non-Conformance Resolution; Records; and Reporting.

The QC Program shall identify and list critical and routine work categories, which shall be used to differentiate the level of reporting, inspection and attention throughout the process.

The QC Program shall include a method to identify and resolve any deviations from the Contract while maintaining the Project schedule. The QC Program shall include a method to prevent recurring deviations once identified and resolved.

The Contractor shall modify the QC Program as needed to meet the requirements of this specification. The QC Program shall be recognized as a dynamic document, subject to revisions and amendments, as required, in response to actual Site conditions, work methods, and to address deviations encountered and corrected throughout the Project.

The Contractor shall furnish the services of a dedicated (sole responsibility), full-time, on-Site Quality Control Manager (QCM) for the Project. The QCM shall report directly to upper management and shall have the authority to issue stop work orders.

When the Contractor's schedule dictates simultaneous work operations, the Contractor is responsible for supplementing the QCM with additional QC personnel (independent of trade staff) to meet the requirements of this specification.

The additional Contractor Quality Control requirements described herein shall be used in conjunction with the Department's Standard Specifications Form 817. The QC Program is neither intended to relieve the Contractor from its responsibility under the Contract, nor to replace the external inspections of the work carried out by the Engineer.

The minimum lump sum bid for this item shall be **\$XXX,XXX**. Failure of the Contractor to bid at least the minimum amount will result in the Department adjusting the Contractor's bid to the minimum bid amount for this item.

Construction Methods:

Submittals

- (1) **QCM:** Within thirty (30) days of Contract award, the Contractor shall submit, in writing, the name of their proposed QCM with a resume of their qualifications, submitted in accordance with the requirements listed below, for concurrence by the Department. The QCM shall not be changed without prior written notification to the Department.

The submittal shall outline the credentials of the proposed QCM, who shall be an individual with a bachelor's degree in Engineering and demonstrated construction experience. This shall include at least 10 years of experience in any combination of the following areas:

- Field inspection experience
- Construction experience relevant to the type of work and the scope of the Project
- Previous experience as a Quality Control professional

The submittal shall also include documented certification or training in quality control principles (NETTCP Quality Assurance Technologist or approved equal) and two (2) letters of recommendation from previous clients.

- (2) QC Program: Within forty-five (45) days of Contract award, the Contractor, with direct input from the QCM, shall prepare and submit to the Department, for review and approval, a written QC Program, including the Elements listed below, and in accordance with all requirements of this specification.

Sample forms and reports intended to be used to assure compliance with this specification shall be included in the initial submittal of the QC Program. Sample forms and reports shall include, but are not limited to:

- Sample document control tracking form
- Sample design control tracking form (for Contractor design-build items)
- Sample shop drawing/working drawing review
- Sample material receiving inspection report
- Sample inspection forms for critical work categories
- Sample special process control forms
- Sample non-conformance report
- Sample daily and monthly reports

The Contractor's QCM, Project Manager and a representative of their upper management shall sign the final QC Program submission and any revisions or amendments thereto. Any revisions or amendments made to the QC Program shall be submitted in writing to the Engineer for acceptance.

Subcontractors, fabricators and suppliers involved in critical work categories, as defined in the QC Program, shall have their own work-item specific QC Plan which shall be included as an addendum to the Contractor's QC Program, and shall comply with all conditions of this item.

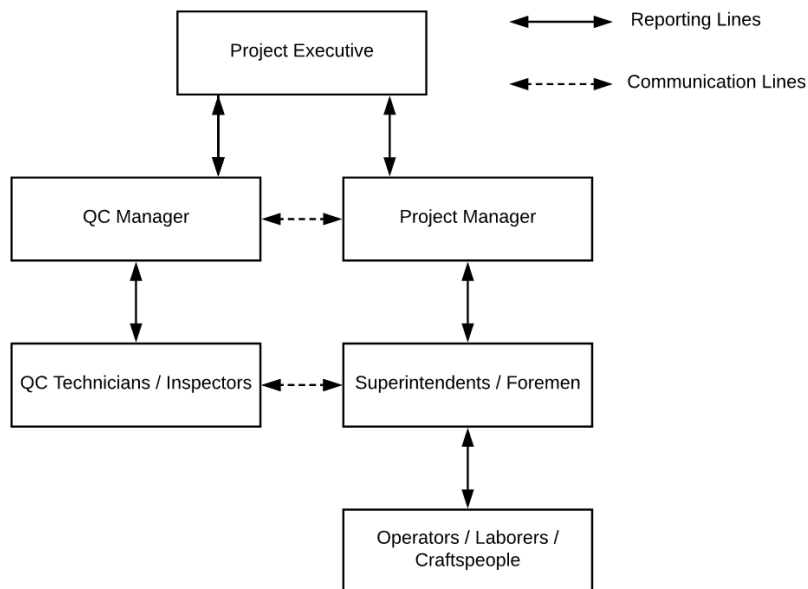
- (3) Additional QC Personnel: When additional QC personnel are required due to simultaneous work operations, the Contractor shall provide resume(s) of qualifications of the proposed personnel at least thirty (30) days in advance of the work. All additional QC personnel utilized for inspecting, sampling, and testing of materials shall be certified by NETTCP (or another entity acceptable to the Department) in the appropriate designation for the work or materials being inspected, sampled, or tested. These individual(s) shall also have demonstrated construction experience of at least 5 years in any combination of the following areas:

- Field inspection experience
- Construction experience relevant to the type of work and the scope of the Project
- Previous experience as a Quality Control professional

- (4) **Laboratories:** All laboratories performing QC testing of Project Produced Materials shall be qualified through either the AASHTO Accreditation Program (AAP) or the NETTCP Laboratory Qualification Program. The Contractor shall provide laboratory proof of qualification at least thirty (30) days in advance of the work.
- (5) **Reports:** The Contractor shall be required to produce and submit to the Engineer daily and monthly inspection reports as described in the Reporting Element of this specification.

Elements of the Contractor Quality Control Program:

1. Organization: This Element shall describe the Contractor’s organization, including reporting relationships within and external to the Contractor’s organization. The name of the QCM shall be clearly stated and this individual shall be responsible to upper management and have the authority to stop work. An organizational chart shall be included to graphically depict the Contractor’s organizational structure and major reporting lines and relationships. The organizational chart shall clearly show the hierarchy between the QCM, upper management and additional QC personnel; and a narrative shall follow which shall define the roles, duties and responsibilities of each person in the implementation of the QC Program and in the resolution of QC issues. This Element shall also include the resumes of all QC personnel.



2. Document Control: This Element shall describe the methods used by the Contractor and the QCM to control the use of the various design documents, shop drawings, procedures, etc. to assure that only the most current, accepted documents are used and are distributed to the individuals performing the work. The process to recall documents which have been superseded or revised shall be addressed. This Element shall identify the submittals that are required by the Contract, the system used to track these submittals and their current status.

A submittal status update spreadsheet shall be submitted with each monthly report, in accordance with the Reporting Element.

3. Design Control: This Element shall describe how the Contractor and the QCM control any design process (i.e. working and shop drawings) for which it is responsible. This shall include the selection of design input data, checking for correctness, completeness, compatibility and format, and reviewing and approving design output documents prior to submission to the

Department. This Element shall provide guidance as to how the QCM or other personnel shall indicate that documents have been reviewed by the Contractor prior to submission, and that Department comments have been adequately addressed prior to any required resubmissions.

4. Procurement Control: This Element shall describe the methods used by the Contractor and the QCM to assure that all materials and specialized equipment provided for the work are as specified. Included shall be guidelines for documenting that purchase documents have been reviewed to assure that correct details have been ordered, including specification, grade, type, color, Buy America or other aspects as required by the Contract.

This Element shall describe receiving inspection activities to be performed, and documentation required to confirm that the correct material or equipment has been delivered. A list of items requiring Materials Certificates and/or Certified Test Reports shall be developed by the Contractor and included in this Element. The Contractor shall prepare a “Material Receiving Inspection Report” which shall include records of inspections performed and reviews of material test reports or other documentation required by the Contract. It shall also include copies of Materials Certificates and/or Certified Test Reports for all these items.

As a minimum, receiving inspections shall be performed on the following materials:

- Materials requiring a Materials Certificate or Certified Test Report
- Source-Controlled Materials (not inspected at the manufacturing plant)
- Job-Controlled Materials (other than concrete, bituminous and soils)

Following a receiving inspection, a copy of the “Material Receiving Inspection Report,” along with associated documents, shall be submitted to the Engineer.

5. Control of Subcontractors, Fabricators and Suppliers: Subcontractors, fabricators and suppliers involved in critical work categories, as defined in 6(a) herein, shall develop their own QC Plan to be added as an addendum to the Contractor’s QC Program, which shall comply with all conditions of this item. The Contractor shall be responsible for reporting on QC activities performed by or for subcontractors, fabricators and suppliers.

It is the Contractor’s responsibility to notify all subcontractors, fabricators, and suppliers of the requirements of the Contract. This Element shall describe the methods used by the Contractor and the QCM to assure that all the applicable requirements of the Contract are passed on to the subcontractors, fabricators and suppliers. This Element shall include the methods used by the Contractor and the QCM to monitor and control the quality of the work performed by subcontractors, fabricators and suppliers, and to obtain the required quality records.

This Element shall also describe how the Contractor will ensure that:

- The Engineer receives advance notice of:
 - The source of supply
 - The location of fabrication, including component parts
 - The schedule of fabrication, including the date of beginning of fabrication and the date the material is to be delivered to the Project
- Material fabricated specifically for the Project will be inspected and approved prior to being shipped or incorporated into the work
- Properly documented mill test reports are furnished by suppliers
- Subcontractors are approved prior to performing any work for or on the Project
- Consider adding additional bullets at QC FDP Meeting

6. Inspection: This Element shall describe how the Contractor and the QCM will assure that the specified quality of materials and workmanship will be achieved. The Contractor’s QC

Program is not related to any inspection carried out by the Engineer. Inspection will include the identification and tracking of the quality characteristics (metrics) used to verify that the level of quality of materials and workmanship conforms to the requirements of the Contract.

The QC Program shall identify the reporting requirements for each item based on its work category, and these reporting requirements will be approved by the Engineer. The work categories will be identified as **critical** or **routine**.

(a) Critical Work Categories: For this Project, critical work categories shall include, but are not limited to the following:

- Construction Staking
- Maintenance & Protection of Traffic
- Earthwork
- Subbase and Base Material
- Hot Mix Asphalt
- Drainage
- Bridge Demolition
- Earth Retaining Systems
- Geotechnical (Foundations, Piles, Drilled Shafts)
- Reinforcing Steel
- Structural Steel
- Structural Concrete
- Electrical
- Landscaping
- Sign Support Foundation
- Environmental Compliance
- Permit Compliance

The QCM shall be familiar with all aspects of work related to critical work categories and no work shall be performed on these categories without the prior knowledge of the QCM. The QC Program shall define specific means and methods that shall be employed to minimize, identify, resolve and prevent recurrence of deviations from the Contract in regards to materials or workmanship for each of the critical work categories listed.

The QC Program shall identify hold points in the critical work categories beyond which work operations cannot proceed until the QCM and the Engineer have inspected the work in place and releases the hold.

When simultaneous critical work categories are required by the Contractor's schedule, additional QC personnel shall be required.

This Element shall describe the system(s) used to assure that all materials and workmanship for critical work categories are in conformance with the Contract, including but not limited to:

- visual inspection of the work, including frequency and hold points
- materials to be tested
- tests to be conducted
- frequency of testing
- locations of sampling
- checks

- intermittent or continuous inspections
- inspections of completed work
- or a combination of above methods

Quality control reporting forms shall be developed to document the work performed by the QCM and QC personnel, on each of these critical work categories. The forms shall be signed by Contractor supervisory field personnel, the QCM and QC personnel (if applicable), to document conformance of the work being performed. All work performed by the QCM and QC personnel on these critical work categories shall be documented and included in the QCM's daily and monthly reports.

(b) Routine Work Categories: All other work categories not covered by 6(a) will be defined as routine work categories and the general provisions of this specification shall apply.

7. Special Process Control: This Element shall describe the measures to be used to assure that any special processes (such as, but not limited to, welding, high-strength bolting, nondestructive examination, critical coatings, surveys, and control of critical tolerances) shall be controlled by procedures that are described in and comply with the Contractor's approved QC Program. The recording of results shall properly document that processes are in conformance with the Contract. In addition, this Element shall describe the methods used to verify, document and track any pre-qualification of the processes, personnel and equipment where required by the Contract.

8. Non-Conformance Resolution: This Element shall describe the protocol(s) for correcting any material or workmanship found not to be in compliance with the Contract, the reporting requirements for documenting any non-compliance, subsequent corrective measures and issue resolution.

(a) Contractor-Issued Non-Conformance Reports: This Element shall outline the Contractor's use of self-issued non-conformance reports to document actions taken to identify, resolve and prevent recurring deviations. The non-conformance reports shall include signatures of the responsible persons for each process of the corrective action taken. Upon resolution of a non-conformance issue, the QC Program shall be revised to identify preventive measures that shall be taken to prevent similar deviations. Contractor supervisory field personnel involved in the work shall be informed of any changes implemented to avoid recurrence of deviations.

(b) Engineer-Issued Non-Compliance Notices (NCN): Non-compliance notices (NCNs) issued by the Engineer shall also be an indication of non-conformance and shall be addressed according to 1.05.11 and resolved to the satisfaction of the Engineer. Upon resolution, the QC Program shall be revised to identify preventive measures that shall be taken to prevent similar deviations. Contractor supervisory field personnel involved in the work shall be informed of any changes implemented to avoid recurrence of deviations.

9. Records: This Element shall describe how various records generated by the Contractor are originated, maintained, received, filed, protected and authenticated. Quality Control records required for submittal to the Engineer shall be described. This Element shall outline the Contractor's procedure for retaining records for a period of 3 years after acceptance of the Contract.

10. Reporting: QC Inspection Reports: The Contractor shall be required to produce and submit to the Engineer daily and monthly inspection reports in accordance with all requirements

of this specification. The QC Program shall clearly define the information that shall be provided as part of the daily and monthly reports.

(a) Daily Reports: Daily reports shall include documentation of all activities, including inspection, material testing, and any work associated with the Elements of this specification, performed by the QCM and other QC personnel. The location of any forms relative to this specification shall be referenced in the daily reports.

For any week that a non-conformance report is issued, either by the Contractor or the Engineer, actions taken to resolve the non-conformance report shall be summarized and included with the submission of the daily reports. Updates on the status of the non-conformance shall continue in each submission of daily reports until the non-conformance issue is resolved. Once resolved, the next submission of daily reports shall document that supervisory field personnel involved in the work have been informed of any changes to be implemented to avoid recurrence of deviations. Any revisions or amendments made to the QC Program, once submitted and accepted by the Engineer, shall be documented in the next submission of daily reports.

Daily reports shall be submitted (as a package) to the Engineer by 12 PM on the Tuesday following the week of the inspection reports, or as agreed to by the Engineer. Except as otherwise authorized by the Engineer, submissions after that time will be considered late.

(b) Monthly Reports: Monthly reports shall include a summary of the work performed, including QC activities, in the previous month and also a one (1) month “look ahead” schedule with expected QC efforts and procedures for critical and routine work categories. Monthly reports shall also include a submittal status update spreadsheet.

Monthly reports shall be submitted to the Engineer by the fifth (5th) business day each month. Except as otherwise authorized by the Engineer, monthly submissions after that time will be considered late.

(c) Quality Assurance/Quality Control (QA/QC) Meetings: Meetings shall be held specific to the QC Program. The Contractor shall, at minimum, be represented by the QCM and shall meet with the Engineer every other week, or more frequently at the Engineer’s request, to review reporting and all work related to this specification.

Method of Measurement: Within forty-five (45) calendar days of the award of the Contract, the Contractor shall submit to the Engineer for approval a schedule of values of its lump sum bid price for this item detailing the following:

1. The development costs to prepare the written QC Program. Development costs shall be ten percent (10%) of the total cost of the item.
2. The cost per-month to provide the services of the QC Program, including the QCM, QC activities, necessary QC personnel, preparing and submitting daily and monthly reports, and all other requirements of this specification. A per-month cost will be derived by taking the lump sum bid price, subtracting the development cost to prepare the written QC Program, and dividing the remainder by the number of Contract months remaining from the date of submission of the written QC Program.

Basis of Payment: This item will be paid for at the Contract lump sum price for “Contractor Quality Control Program Level 2” complete, which price shall include all submittals, QC

Program revisions and amendments, inspections, monitoring, daily logs, reports, meetings, records, and all materials, equipment, labor and work incidental thereto.

Upon approval of the schedule of values by the Engineer, payments for work performed will be made as follows:

1. Upon acceptance of the written QC Program, the lump sum development cost from the payment schedule will be approved for payment.
2. Upon acceptable completion of the services of the QC Program for the month, the per-month cost will be approved for payment.

The Engineer reserves the right to apply the following reductions to the monthly payment portion, which cannot be recovered and will result in a reduction in the lump sum amount, should the Contractor fail to meet the requirements of this specification:

1. QC staff: A five percent (5%) reduction to the monthly payment will be applied for each day that acceptable QC services are not provided. The total reduction for any calendar month will not exceed the monthly payment for the item.
2. Reports: A five percent (5%) reduction to the monthly payment will be applied for each day that the required reports have been submitted late, up to a maximum of fifty percent (50%) of the monthly payment per report. This five percent (5%) reduction will apply to each independent report (each package of daily reports, described in 9(a) above, submitted on a weekly basis is considered one independent report). The total reduction for any calendar month will not exceed the monthly payment for the item.
3. QA/QC Meetings: A twenty-five percent (25%) reduction to the monthly payment will be applied for each bi-weekly QA/QC meeting not attended by the QCM. The total reduction for any calendar month will not exceed the monthly payment for the item.

Should the Contractor fail to continuously provide an acceptable QC Program, as required by this specification, the Engineer may withhold the entire monthly estimate until such time as all requirements are met.

Should the Contractor fail to comply with the QCM requirements of this specification, the QCM shall be replaced at the Engineer's request.

Only one monthly payment will be made for each calendar month regardless of the number of personnel required to complete the specified work.

Pay Item	Pay Unit
Contractor Quality Control Program Level 2	l.s.

ITEM #0969066A - CONSTRUCTION FIELD OFFICE, EXTRA LARGE

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

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

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

Description \ Office Size	Extra Large
Minimum Sq. Ft. of floor space with a minimum ceiling height of 7 ft.	2000
Minimum number of exterior entrances.	2
Minimum number of parking spaces.	15

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

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

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

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

Lighting: The Contractor shall equip the office interior with electric lighting that provides a minimum illumination level of 100 foot-candles at desk level height, and electric outlets for each desk and drafting table. The Contractor shall also provide exterior lighting that provides a minimum

illumination level of 2 foot-candles throughout the parking area and for a minimum distance of 10 ft. on each side of the field office.

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

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

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

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

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

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

machine. For an Extra-Large field office this shall consist of four (4) telephone lines: three (3) lines for phone/voice service and one (1) line dedicated for facsimile machine. The Contractor shall pay all charges.

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

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

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

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

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

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

Furnishing Description	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.	12
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.).	12
Drafting type tables (3 ft. x 6 ft.) and supported by wall brackets and legs; and matching drafters stool that have pneumatic seat height adjustment, seat back and dual wheel casters on the base.	2
Conference table, 3 ft. x 12 ft.	1
Table – 3 ft. x 6 ft.	1
Office Chairs.	20
Mail slot bin – legal size.	1
Non-fire resistant cabinet.	4
Fire resistant cabinet (legal size/4 drawer), locking.	3
Storage racks to hold 3 ft. x 5 ft. display charts.	2
Vertical plan racks for 2 sets of 2 ft. x 3 ft. plans for each rack.	2
Double door supply cabinet with 4 shelves and a lock – 6 ft. x 4 ft.	2
Case of cardboard banker boxes (Min 10 boxes/case)	3
Open bookcase – 3 shelves – 3 ft. long.	12
White Dry-Erase Board, 36" x 48" min. with markers and eraser.	1
Interior partitions – 6 ft. x 6 ft., soundproof type, portable and freestanding.	6
Coat rack with 20 coat capacity.	1
Wastebaskets - 30 gal., including plastic waste bags.	2
Wastebaskets - 5 gal., including plastic waste bags.	10
Electric wall clock.	2
Telephone.	-
Full size stapler 20 (sheet capacity, with staples)	8
Desktop tape dispensers (with Tape)	8
8 Outlet Power Strip with Surge Protection	9
Rain Gauge	1
Business telephone system for three lines with ten handsets, intercom capability, and one speaker phone for conference table.	1
Refrigerator – 18.0 c.f. min.	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
Microwave, 1.2 c.f. , 1000W min.	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.	2
Electronic office type printing calculators capable of addition, subtraction, multiplication and division with memory and a supply of printing paper.	4
Small Multi-Function Laser Printer/Copier/Scanner/Fax combination unit, network capable, as specified below under <u>Computer Related Hardware and Software</u> .	
Large Multi-Function Laser Printer/Copier/Scanner/Fax combination unit, network capable, as specified below under <u>Computer Related Hardware and Software</u> .	1
Field Office Wi-Fi Connection as specified below under <u>Computer Related Hardware and Software</u>	1
Wi-Fi Printer as specified below under <u>Computer Related Hardware and Software</u> .	1
Digital Camera as specified below under <u>Computer Related Hardware and Software</u> .	3
Video Projector as specified below under <u>Computer Related Hardware and Software</u> .	1
Smart Board as specified below under <u>Computer Related Hardware and Software</u> .	1
Infrared Thermometer, including annual third party certified calibration, case, and cleaning wipes.	2
Concrete Curing Box as specified below under Concrete Testing Equipment.	5
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.	4
Concrete Slump Cone and accessories as specified below under Concrete Testing Equipment.	4
First Aid Kit	1
Flip Phones as specified under <u>Computer Related Hardware and Software</u> .	-
Smart Phones as specified under <u>Computer Related Hardware and Software</u> .	12

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

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

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

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

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

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

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

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

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

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

- A) Concrete Cylinder Curing Box – meeting the requirements of Section 6.12 of the Standard Specifications.
- B) Air Meter – The air meter provided shall be in good working order and meet the requirements of AASHTO T 152.
- C) Slump Cone Mold – Slump cone, base plate, and tamping rod shall be provided in like-new condition and meet the requirements of AASHTO T119, Standard Test Method for Slump of Hydraulic-Cement Concrete.

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

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

Maintenance: During the occupancy by the CTDOT, the Contractor shall maintain all facilities and furnishings provided under the above requirements, and shall maintain and keep the office quarters clean through the use of weekly professional cleaning to include, but not limited to, washing & waxing floors, cleaning restrooms, removal of trash, etc. Exterior areas shall be mowed and clean of debris. A trash receptacle (dumpster) with weekly pickup (trash removal) shall be provided. Snow removal, sanding and salting of all parking, walkway, and entrance ways areas

shall be accomplished during a storm if on a workday during work hours, immediately after a storm and prior to the start of a workday. If snow removal, salting and sanding are not completed by the specified time, the State will provide the service and all costs incurred will be deducted from the next payment estimate.

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

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

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

<u>Pay Item</u>	<u>Pay Unit</u>
Construction Field Office, Extra Large	Month

ITEM #0971001A – MAINTENANCE AND PROTECTION OF TRAFFIC

Article 9.71.01 – Description is supplemented by the following:

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

Interstate 84

The Contractor shall maintain and protect the minimum number of through lanes and shoulders as dictated in the Special Provision for Section 1.08 - Prosecution and Progress "Limitations of Operations - Minimum Number of Lanes to Remain Open" Chart, on a paved travel path not less than 12 feet in width per lane.

The Contractor shall be allowed to halt traffic for a period of time not to exceed 10 minutes for the purpose of erecting / removing structural steel, or blasting operations. If more than one 10-minute period is required, the Contractor shall allow all stored vehicles to proceed through the work area prior to the next stoppage.

Ramps and Turning Roadways

The Contractor shall maintain and protect existing traffic operations.

Excepted therefrom will be those periods, during the allowable periods, when the Contractor is actively working, at which time the Contractor shall be allowed to maintain and protect a minimum of one lane of traffic, on a paved travel path not less than 12 feet in width.

All Other Roadways

The Contractor will not be allowed to perform any work which will interfere with the existing number of travel lanes including turning lanes in each direction between 6:00 a.m. to 9:00 a.m. and between 3:00 p.m. and 6:00 p.m. Monday through Friday and 10:00 a.m. to 9:00 p.m. Saturday and Sunday.

Article 9.71.03 - Construction Method is supplemented as follows:

General

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

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

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

If applicable, when an existing sign is removed, it shall be either relocated or replaced by a new sign during the same working day.

The Contractor shall not store any material on-site which would present a safety hazard to motorists or pedestrians (e.g. fixed object or obstruct sight lines).

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

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

Construction vehicles entering travel lanes at speeds less than the posted speed are interfering with traffic, and shall not be allowed without a lane closure. The lane closure shall be of sufficient length to allow vehicles to enter or exit the work area at posted speeds, in order to merge with existing traffic.

Existing Signing

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

Requirements for Winter

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

Signing Patterns

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

Pavement Markings - Limited Access Highways, Turning Roadways and Ramps

During construction, the Contractor shall maintain all pavement markings throughout the limits of the project.

Interim Pavement Markings

The Contractor shall install painted pavement markings, which shall include lane lines (broken lines), edge lines, stop bars, lane-use arrows and gore markings, on each intermediate course of bituminous concrete pavement and on any milled surface by the end of the work day/night. All painted pavement markings will be paid under the appropriate items.

If an intermediate course of bituminous concrete pavement will be exposed throughout the winter, then Epoxy Resin Pavement Markings shall be installed unless directed otherwise by the Engineer.

Final Pavement Markings

The Contractor shall install painted pavement markings on the final course of bituminous concrete pavement by the end of the work day/night. If the painted pavement markings are not installed by the end of the work day/night, then Temporary Plastic Pavement Marking Tape shall be installed as described above and the painted pavement markings shall be installed by the end of the work day/night on Friday of that week.

If Temporary Plastic Pavement Marking Tape is installed, the Contractor shall remove and dispose of these markings when the painted pavement markings are installed. The cost of furnishing, installing and removing the Temporary Plastic Pavement Marking Tape shall be at the Contractor's expense.

The Contractor shall install permanent Epoxy Resin Pavement Markings in accordance with Section 12.10 entitled "Epoxy Resin Pavement Markings" after such time as determined by the Engineer.

TRAFFIC CONTROL DURING CONSTRUCTION OPERATIONS

The following guidelines shall assist field personnel in determining when and what type of traffic control patterns to use for various situations. These guidelines shall provide for the safe and efficient movement of traffic through work zones and enhance the safety of work forces in the work area.

TRAFFIC CONTROL PATTERNS

Traffic control patterns shall be used when a work operation requires that all or part of any vehicle or work area protrudes onto any part of a travel lane or shoulder. For each situation, the installation of traffic control devices shall be based on the following:

- Speed and volume of traffic
- Duration of operation
- Exposure to hazards

Traffic control patterns shall be uniform, neat and orderly so as to command respect from the motorist.

In the case of a horizontal or vertical sight restriction in advance of the work area, the traffic control pattern shall be extended to provide adequate sight distance for approaching traffic.

If a lane reduction taper is required to shift traffic, the entire length of the taper shall be installed on a tangent section of roadway so that the entire taper area can be seen by the motorist.

Any existing signs that are in conflict with the traffic control patterns shall be removed, covered, or turned so that they are not readable by oncoming traffic.

When installing a traffic control pattern, a Buffer Area shall be provided and this area shall be free of equipment, workers, materials and parked vehicles.

Typical traffic control plans 19 through 25 may be used for moving operations such as line striping, pot hole patching, mowing, or sweeping when it is necessary for equipment to occupy a travel lane.

Traffic control patterns will not be required when vehicles are on an emergency patrol type activity or when a short duration stop is made and the equipment can be contained within the shoulder. Flashing lights and appropriate trafficperson shall be used when required.

Although each situation must be dealt with individually, conformity with the typical traffic control plans contained herein is required. In a situation not adequately covered by the typical traffic control plans, the Contractor must contact the Engineer for assistance prior to setting up a traffic control pattern.

PLACEMENT OF SIGNS

Signs must be placed in such a position to allow motorists the opportunity to reduce their speed prior to the work area. Signs shall be installed on the same side of the roadway as the work area. On multi-lane divided highways, advance warning signs shall be installed on both sides of the highway. On directional roadways (on-ramps, off-ramps, one-way roads), where the sight distance to signs is restricted, these signs shall be installed on both sides of the roadway.

ALLOWABLE ADJUSTMENT OF SIGNS AND DEVICES SHOWN ON THE TRAFFIC CONTROL PLANS

The traffic control plans contained herein show the location and spacing of signs and devices under ideal conditions. Signs and devices shall be installed as shown on these plans whenever possible.

The proper application of the traffic control plans and installation of traffic control devices depends on actual field conditions.

Adjustments to the traffic control plans shall be made only at the direction of the Engineer to improve the visibility of the signs and devices and to better control traffic operations. Adjustments to the traffic control plans shall be based on safety of work forces and motorists, abutting property requirements, driveways, side roads, and the vertical and horizontal curvature of the roadway.

The Engineer may require that the traffic control pattern be located significantly in advance of the work area to provide better sight line to the signing and safer traffic operations through the work zone.

Table I indicates the minimum taper length required for a lane closure based on the posted speed limit of the roadway. These taper lengths shall only be used when the recommended taper lengths shown on the traffic control plans cannot be achieved.

TABLE I – MINIMUM TAPER LENGTHS

POSTED SPEED LIMIT MILES PER HOUR	MINIMUM TAPER LENGTH IN FEET FOR A SINGLE LANE CLOSURE
30 OR LESS	180
35	250
40	320
45	540
50	600
55	660
65	780

SECTION 1. WORK ZONE SAFETY MEETINGS

- 1.a) Prior to the commencement of work, a work zone safety meeting will be conducted with representatives of DOT Construction, Connecticut State Police (Local Barracks), Municipal Police, the Contractor (Project Superintendent) and the Traffic Control Subcontractor (if different than the prime Contractor) to review the traffic operations, lines of responsibility, and operating guidelines which will be used on the project. Other work zone safety meetings during the course of the project shall be scheduled as needed.
- 1.b) A Work Zone Safety Meeting Agenda shall be developed and used at the meeting to outline the anticipated traffic control issues during the construction of this project. Any issues that can't be resolved at these meetings will be brought to the attention of the District Engineer and the Office of Construction. The agenda shall include:
 - Review Project scope of work and time
 - Review Section 1.08, Prosecution and Progress
 - Review Section 9.70, Trafficpersons
 - Review Section 9.71, Maintenance and Protection of Traffic
 - Review Contractor's schedule and method of operations.
 - Review areas of special concern: ramps, turning roadways, medians, lane drops, etc.
 - Open discussion of work zone questions and issues
 - Discussion of review and approval process for changes in contract requirements as they relate to work zone areas

SECTION 2. GENERAL

- 2.a) If the required minimum number of signs and equipment (i.e. one High Mounted Internally Illuminated Flashing Arrow for each lane closed, two TMAs, Changeable Message Sign, etc.) are not available; the traffic control pattern shall not be installed.
- 2.b) The Contractor shall have back-up equipment (TMAs, High Mounted Internally Illuminated Flashing Arrow, Changeable Message Sign, construction signs, cones/drums, etc.) available at all times in case of mechanical failures, etc. The only exception to this is in the case of sudden equipment breakdowns in which the pattern may be installed but the Contractor must provide replacement equipment within 24 hours.
- 2.c) Failure of the Contractor to have the required minimum number of signs, personnel and equipment, which results in the pattern not being installed, shall not be a reason for a time extension or claim for loss time.
- 2.d) In cases of legitimate differences of opinion between the Contractor and the Inspection staff, the Inspection staff shall err on the side of safety. The matter shall be brought to the District Office for resolution immediately or, in the case of work after regular business hours, on the next business day.

SECTION 3. INSTALLING AND REMOVING TRAFFIC CONTROL PATTERNS

- 3.a) Lane Closures shall be installed beginning with the advance warning signs and proceeding forward toward the work area.
- 3.b) Lane Closures shall be removed in the reverse order, beginning at the work area, or end of the traffic control pattern, and proceeding back toward the advance warning signs.
- 3.c) Stopping traffic may be allowed:
- As per the contract for such activities as blasting, steel erection, etc.
 - During paving, milling operations, etc. where, in the middle of the operation, it is necessary to flip the pattern to complete the operation on the other half of the roadway and traffic shall not travel across the longitudinal joint or difference in roadway elevation.
 - To move slow moving equipment across live traffic lanes into the work area.
- 3.d) Temporary road closures using Rolling Road Blocks (RRB) will be allowed on limited access highways for operations associated with the installation and removal of temporary lane closures. RRB will be allowed for the installation and removal of lead signs and lane tapers only. The maximum duration of a RRB shall be limited to 15 minutes and shall meet the following requirements:
- RRB may not start prior to the time allowed in the contract Limitations of Operations for sign pattern installation. Sign pattern removal must be complete prior to the time indicated in the Limitations of Operation for restoring the lanes to traffic.
 - On limited access highways with 4 lanes or more, a RRB may not start until the Limitations of Operation Chart allows a 2 lane closure. In areas with good sight lines and full shoulders, opposite side lead signs shall be installed in a separate operation.
 - Truck-Mounted Impact Attenuators (TMAs) equipped with arrow boards shall be used to slow traffic to implement the RRB. State Police Officers in marked vehicles may be used to support the implementation of the RRB. The RRB shall start by having all vehicles, including Truck-Mounted Impact Attenuators TMAs and police vehicles leave the shoulder or on-ramp and accelerate to a normal roadway speeds in each lane, then the vehicles will position themselves side by side and decelerate to the RRB speed on the highway.
 - **PRE-WARNING VEHICLE (PWV):** An additional Truck-Mounted Impact Attenuator TMA equipped with a Portable Changeable Message Sign shall be utilized to advise the motorists that sign pattern installation / removal is underway. The Pre-Warning Vehicle (PWV) shall be initially positioned in the right shoulder ½ mile prior to the RRB operation. If a traffic queue reaches the PWV's initial location, the contractor shall slowly reverse the PWV along the shoulder to position itself prior to the new back of queue. A Pre-Warning Vehicle, as specified elsewhere in the

- contract, shall be utilized to advise the motorists that sign pattern installation / removal is underway.
- The RRB duration shall not exceed 15 minutes from start of the traffic block until all lanes are opened as designated in the Limitation of Operations chart. If the RRB duration exceeds 15 minutes on 2 successive shifts, no further RRB will be allowed until the Contractor obtains approval for a revised installation procedure from the respective construction District.
 - RRB shall not be utilized to expand a lane closure pattern to an additional lane during the shift. The workers and equipment required to implement the additional lane closure shall be staged from within the closed lane. Attenuator trucks (and State Police if available) shall be used to protect the workers installing the taper in the additional lane.
 - Exceptions to these work procedures may be submitted to the District Office for consideration. A minimum of 2 business days shall be allowed for review and approval by the District.
 - The RRB procedures (including any approved exceptions) will be reviewed and discussed by the inspection team and the Contractor in advance of the work. The implementation of the agreed upon plan will be reviewed with the State Police during the Work Zone Safety meeting held before each shift involving temporary lane closures. If the State Police determine that alternative procedures shall be implemented for traffic control during the work shift, the Department and Contractor will attempt to resolve any discrepancies with the duty sergeant at the Troop. If the discrepancies are unable to be resolved prior to the start of the shift, the work will proceed as recommended by the Trooper's (within reason). Any unresolved issues will be addressed the following day.
- 3.e) The Contractor must adhere to using the proper signs, placing the signs correctly, and ensuring the proper spacing of signs.
- 3.f) Additional devices are required on entrance ramps, exit ramps, and intersecting roads to warn and/or move traffic into the proper travel path prior to merging/exiting with/from the main line traffic. This shall be completed before installing the mainline pattern past the ramp or intersecting roadway.
- 3.g) Prior to installing a pattern, any conflicting existing signs shall be covered with an opaque material. Once the pattern is removed, the existing signs shall be uncovered.
- 3.h) On limited access roadways, workers are prohibited from crossing the travel lanes to install and remove signs or other devices on the opposite side of the roadway. Any signs or devices on the opposite side of the roadway shall be installed and removed separately.

**SECTION 4. USE OF HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING
ARROW**

- 4.a) On limited access roadways, one Flashing Arrow shall be used for each lane that is closed. The Flashing Arrow shall be installed concurrently with the installation of the traffic control pattern and its placement shall be as shown on the traffic control plan. For multiple lane closures, one Flashing Arrow is required for each lane closed. If conditions warrant, additional Flashing Arrows shall be employed (i.e.: curves, major ramps, etc.).
- 4.b) On non-limited access roadways, the use of a Flashing Arrow for lane closures is optional. The roadway geometry, sight line distance, and traffic volume shall be considered in the decision to use the Flashing Arrow.
- 4.c) The Flashing Arrow shall not be used on two lane, two-way roadways for temporary alternating one-way traffic operations.
- 4.d) The Flashing Arrow board display shall be in the “arrow” mode for lane closure tapers and in the “caution” mode (four corners) for shoulder work, blocking the shoulder, or roadside work near the shoulder. The Flashing Arrow shall be in the “caution” mode when it is positioned in the closed lane.
- 4.e) The Flashing Arrow shall not be used on a multi-lane roadway to laterally shift all lanes of traffic, because unnecessary lane changing may result.

SECTION 5. USE OF TRUCK MOUNTED OR TRAILER MOUNTED IMPACT ATTENUATOR VEHICLES (TMAs)

- 5.a) For lane closures on limited access roadways, a minimum of two TMAs shall be used to install and remove traffic control patterns. If two TMAs are not available, the pattern shall not be installed.
- 5.b) On non-limited access roadways, the use of TMAs to install and remove patterns closing a lane(s) is optional. The roadway geometry, sight line distance, and traffic volume shall be considered in the decision to utilize the TMAs.
- 5.c) Generally, to establish the advance and transition signing, one TMA shall be placed on the shoulder and the second TMA shall be approximately 1,000 feet ahead blocking the lane. The flashing arrow board mounted on the TMA shall be in the “flashing arrow” mode when taking the lane. The sign truck and workers shall be immediately ahead of the second TMA. In no case shall the TMA be used as the sign truck or a work truck. Once the transition is in place, the TMAs shall travel in the closed lane until all Changeable Message Signs, signs, Flashing Arrows, and cones/drums are installed. The flashing arrow board mounted on the TMA shall be in the “caution” mode when traveling in the closed lane.
- 5.d) A TMA shall be placed prior to the first work area in the pattern. If there are multiple work areas within the same pattern, then additional TMAs shall be positioned at each

additional work area as needed. The flashing arrow board mounted on the TMA shall be in the “caution” mode when in the closed lane.

- 5.e) TMAs shall be positioned a sufficient distance prior to the workers or equipment being protected to allow for appropriate vehicle roll-ahead in the event that the TMA is hit, but not so far that an errant vehicle could travel around the TMA and into the work area. For additional placement and use details, refer to the specification entitled “Truck-Mounted or Trailer-Mounted Impact Attenuator”. Some operations, such as paving and concrete repairs, do not allow for placement of the TMA(s) within the specified distances. In these situations, the TMA(s) shall be placed at the beginning of the work area and shall be advanced as the paving or concrete operations proceed.
- 5.f) TMAs will be paid in accordance with how the unit is utilized. If it is used as a TMA and is in the proper location as specified, then it will be paid at the specified hourly rate for “Truck-Mounted or Trailer-Mounted Impact Attenuator”. When the TMA is used as a Flashing Arrow, it will be paid at the daily rate for “High Mounted Internally Illuminated Flashing Arrow”. If a TMA is used to install and remove a pattern and is also used as a Flashing Arrow in the same day, then the unit will be paid as a “Truck-Mounted or Trailer-Mounted Impact Attenuator” for the hours used to install and remove the pattern, typically 2 hours (1 hour to install and 1 hour to remove). If the TMA is also used as a Flashing Arrow during the same day, then the unit will be paid at the daily rate as a “High Mounted Internally Illuminated Flashing Arrow”.

SECTION 6. USE OF TRAFFIC DRUMS AND TRAFFIC CONES

- 6.a) Traffic drums shall be used for taper channelization on limited-access roadways, ramps, and turning roadways and to delineate raised catch basins and other hazards.
- 6.b) Traffic drums shall be used in place of traffic cones in traffic control patterns that are in effect for more than a 36-hour duration.
- 6.c) Traffic Cones less than 42 inches in height shall not be used on limited-access roadways or on non-limited access roadways with a posted speed limit of 45 mph and above.
- 6.d) Typical spacing of traffic drums and/or cones shown on the Traffic Control Plans in the Contract are maximum spacings and may be reduced to meet actual field conditions as required.

SECTION 7. USE OF (REMOTE CONTROL) CHANGEABLE MESSAGE SIGNS (CMS)

- 7.a) For lane closures on limited access roadways, one CMS shall be used in advance of the traffic control pattern. Prior to installing the pattern, the CMS shall be installed and in operation,

displaying the appropriate lane closure information (i.e.: Left Lane Closed - Merge Right). The CMS shall be positioned ½ - 1 mile ahead of the lane closure taper. If the nearest Exit ramp is greater than the specified ½ - 1 mile distance, than an additional CMS shall be positioned a sufficient distance ahead of the Exit ramp to alert motorists to the work and therefore offer them an opportunity to take the exit.

- 7.b) CMS shall not be installed within 1000 feet of an existing CMS.
- 7.c) On non-limited access roadways, the use of CMS for lane closures is optional. The roadway geometry, sight line distance, and traffic volume shall be considered in the decision to use the CMS.
- 7.d) The advance CMS is typically placed off the right shoulder, 5 feet from the edge of pavement. In areas where the CMS cannot be placed beyond the edge of pavement, it may be placed on the paved shoulder with a minimum of five (5) traffic drums placed in a taper in front of it to delineate its position. The advance CMS shall be adequately protected if it is used for a continuous duration of 36 hours or more.
- 7.e) When the CMS are no longer required, they shall be removed from the clear zone and have the display screen cleared and turned 90° away from the roadway.
- 7.f) The CMS shall not be used for generic messages (ex: Road Work Ahead, Bump Ahead, Gravel Road, etc.).
- 7.g) The CMS shall be used for specific situations that need to command the motorist's attention which cannot be conveyed with standard construction signs (Examples include: Exit 34 Closed Sat/Sun - Use Exit 35, All Lanes Closed - Use Shoulder, Workers on Road - Slow Down).
- 7.h) Messages that need to be displayed for long periods of time, such as during stage construction, shall be displayed with construction signs. For special signs, please coordinate with the Office of Construction and the Division of Traffic Engineering for the proper layout/dimensions required.
- 7.i) The messages that are allowed on the CMS are as follows:

<u>Message No.</u>	<u>Frame 1</u>	<u>Frame 2</u>	<u>Message No.</u>	<u>Frame 1</u>	<u>Frame 2</u>
1	LEFT LANE CLOSED	MERGE RIGHT	9	LANES CLOSED AHEAD	REDUCE SPEED
2	2 LEFT LANES CLOSED	MERGE RIGHT	10	LANES CLOSED AHEAD	USE CAUTION

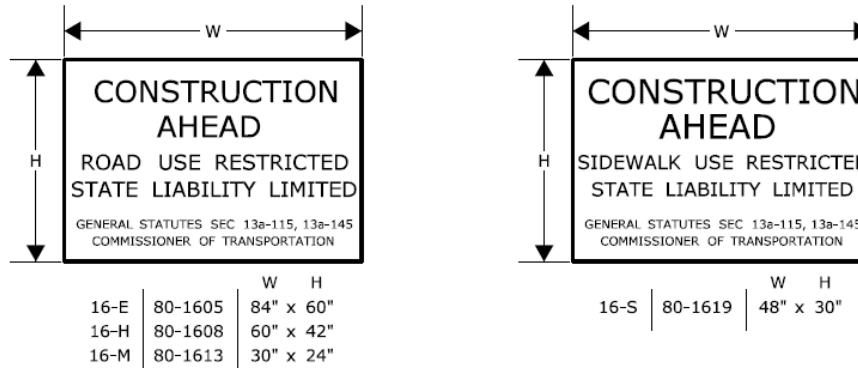
3	LEFT LANE CLOSED	REDUCE SPEED	11	WORKERS ON ROAD	REDUCE SPEED
4	2 LEFT LANES CLOSED	REDUCE SPEED	12	WORKERS ON ROAD	SLOW DOWN
5	RIGHT LANE CLOSED	MERGE LEFT	13	EXIT XX CLOSED	USE EXIT YY
6	2 RIGHT LANES CLOSED	MERGE LEFT	14	EXIT XX CLOSED USE YY	FOLLOW DETOUR
7	RIGHT LANE CLOSED	REDUCE SPEED	15	2 LANES SHIFT AHEAD	USE CAUTION
8	2 RIGHT LANES CLOSED	REDUCE SPEED	16	3 LANES SHIFT AHEAD	USE CAUTION

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

SECTION 8. USE OF STATE POLICE OFFICERS

- 8.a) State Police may be utilized only on limited access highways and secondary roadways under their primary jurisdiction. One Officer may be used per critical sign pattern. Shoulder closures and right lane closures can generally be implemented without the presence of a State Police Officer. Likewise in areas with moderate traffic and wide, unobstructed medians, left lane closures can be implemented without State Police presence. Under some situations it may be desirable to have State Police presence, when one is available. Examples of this include: nighttime lane closures; left lane closures with minimal width for setting up advance signs and staging; lane and shoulder closures on turning roadways/ramps or mainline where sight distance is minimal; and closures where extensive turning movements or traffic congestion regularly occur, however they are not required.
- 8.b) Once the pattern is in place, the State Police Officer shall be positioned in a non-hazardous location in advance of the pattern. If traffic backs up beyond the beginning of the pattern, then the State Police Officer shall be repositioned prior to the backup to give warning to the oncoming motorists. The State Police Officer and TMA shall not be in proximity to each other.
- 8.c) Other functions of the State Police Officer(s) may include:
- Assisting entering/exiting construction vehicles within the work area.
 - Enforcement of speed and other motor vehicle laws within the work area, if specifically requested by the project.
- 8.d) State Police Officers assigned to a work site are to only take direction from the Engineer.

SERIES 16 SIGNS



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

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

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

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

SIGN 16-E SHALL BE USED ON ALL EXPRESSWAYS.

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

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

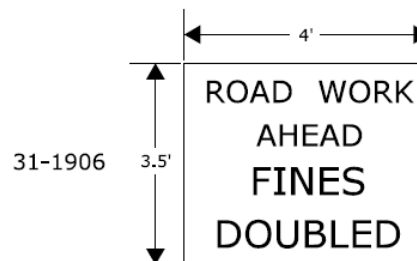
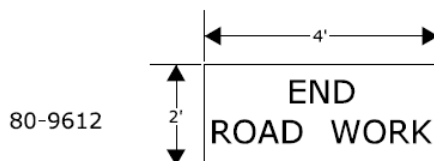
REGULATORY SIGN "ROAD WORK AHEAD, FINES DOUBLED"

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

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

"END ROAD WORK" SIGN

THE LAST SIGN IN THE PATTERN MUST BE THE "END ROAD WORK" SIGN.



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN
REQUIRED SIGNS

NOTES FOR TRAFFIC CONTROL PLANS

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

TABLE 1 - MINIMUM TAPER LENGTHS

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

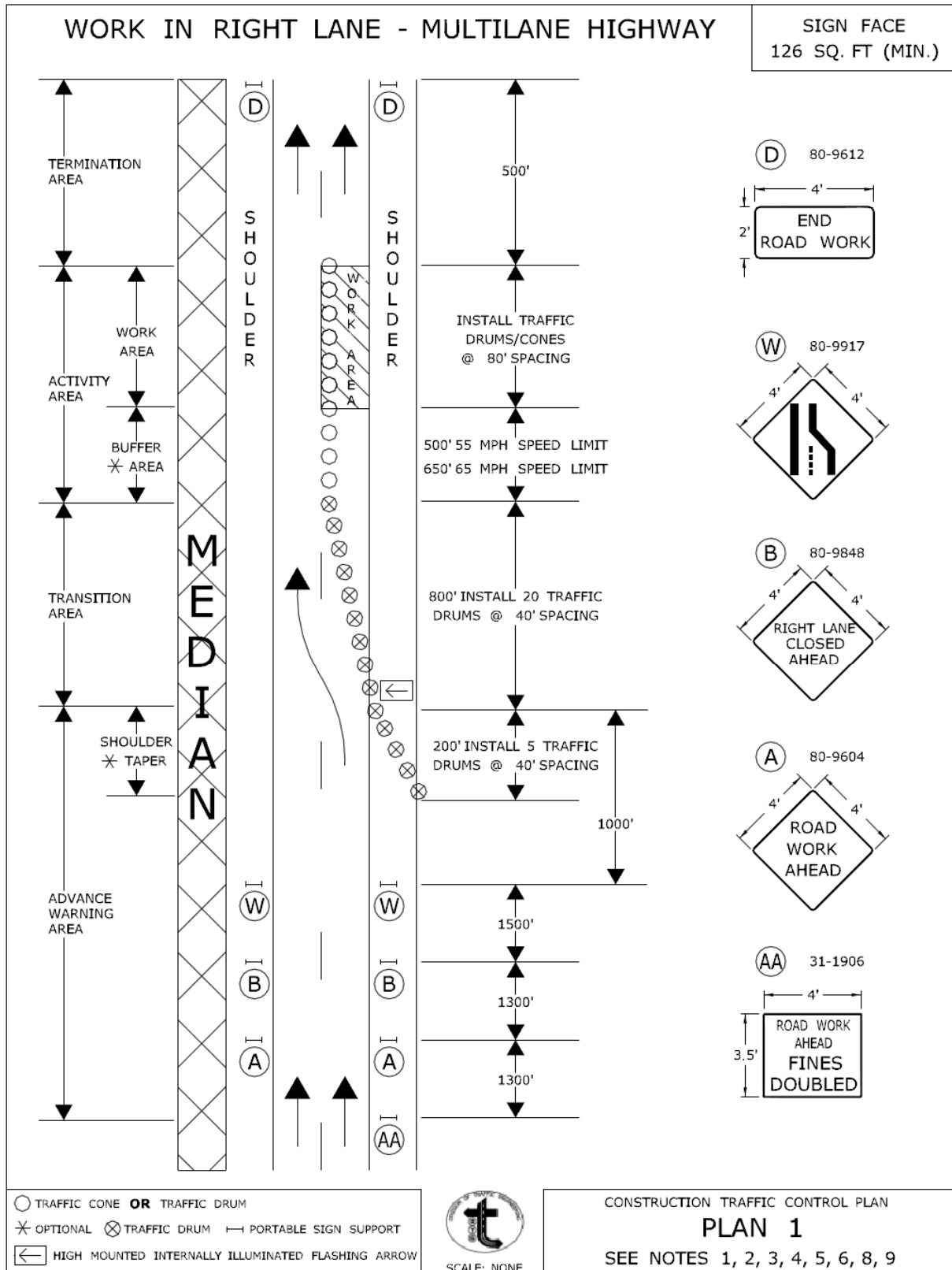
METRIC CONVERSION CHART (1" = 25mm)

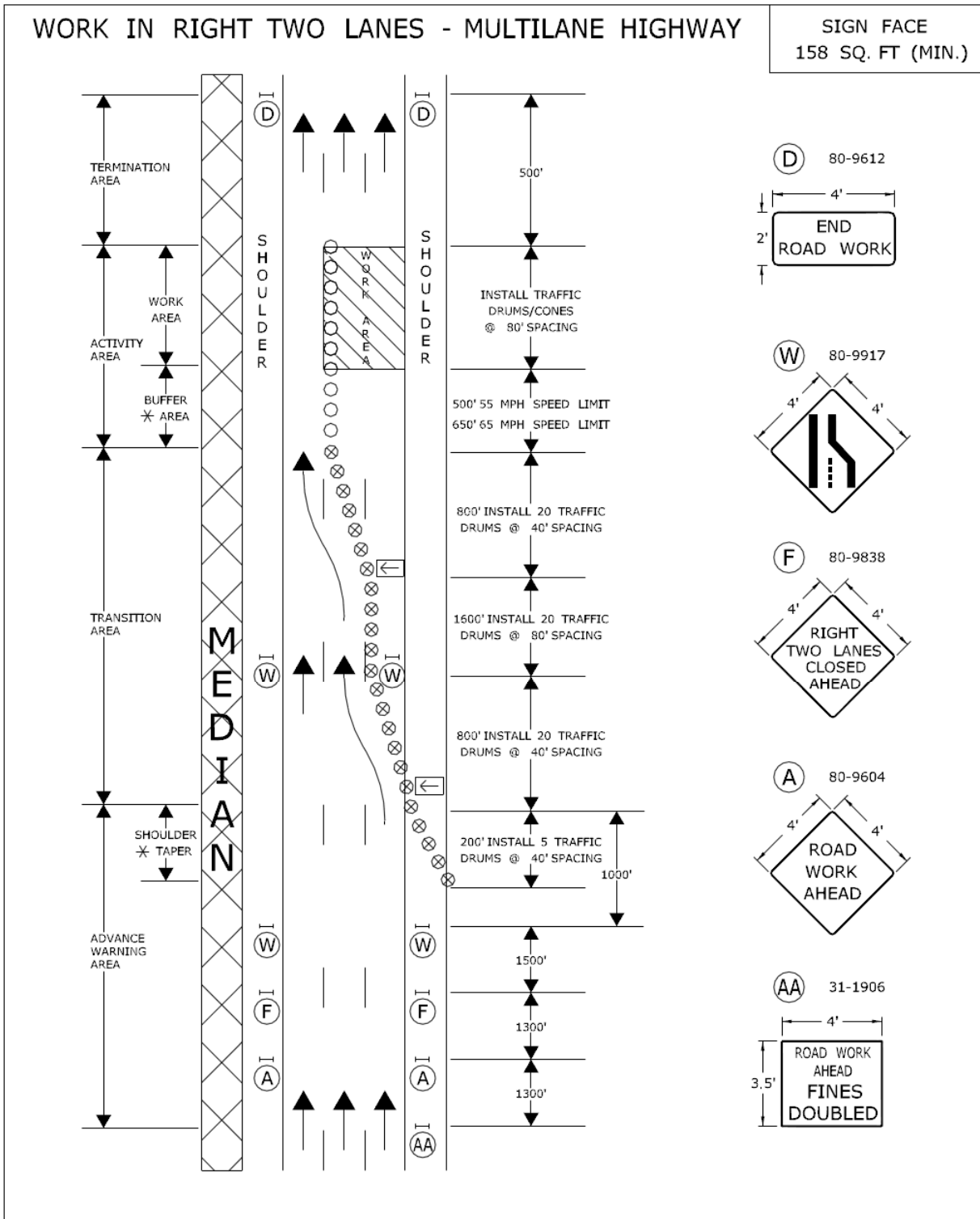
ENGLISH	METRIC	ENGLISH	METRIC	ENGLISH	METRIC
12"	300mm	42"	1050mm	72"	1800mm
18"	450mm	48"	1200mm	78"	1950mm
24"	600mm	54"	1350mm	84"	2100mm
30"	750mm	60"	1500mm	90"	2250mm
36"	900mm	66"	1650mm	96"	2400mm



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN NOTES





- TRAFFIC CONE **OR** TRAFFIC DRUM
- ✱ OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ← HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

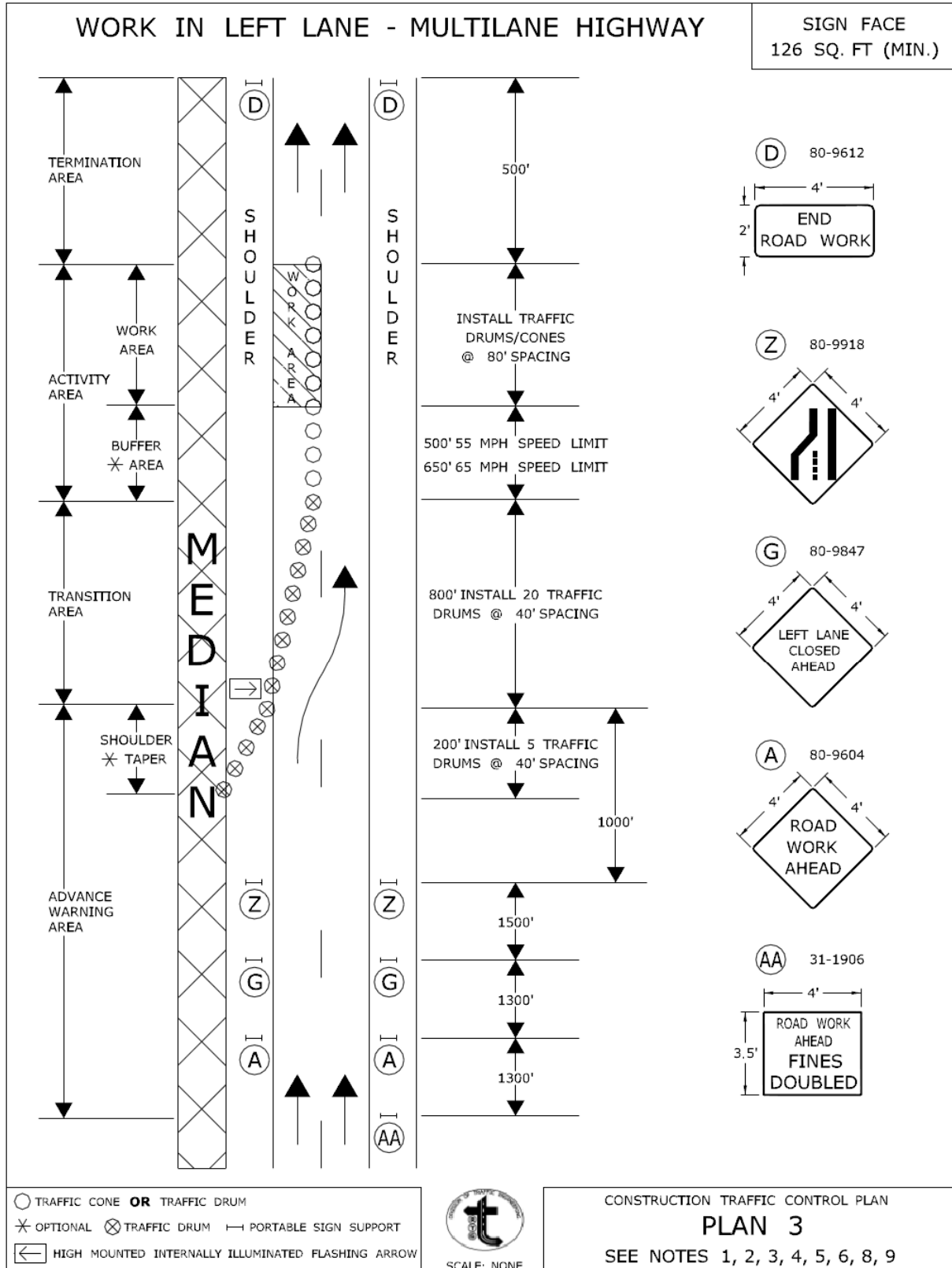


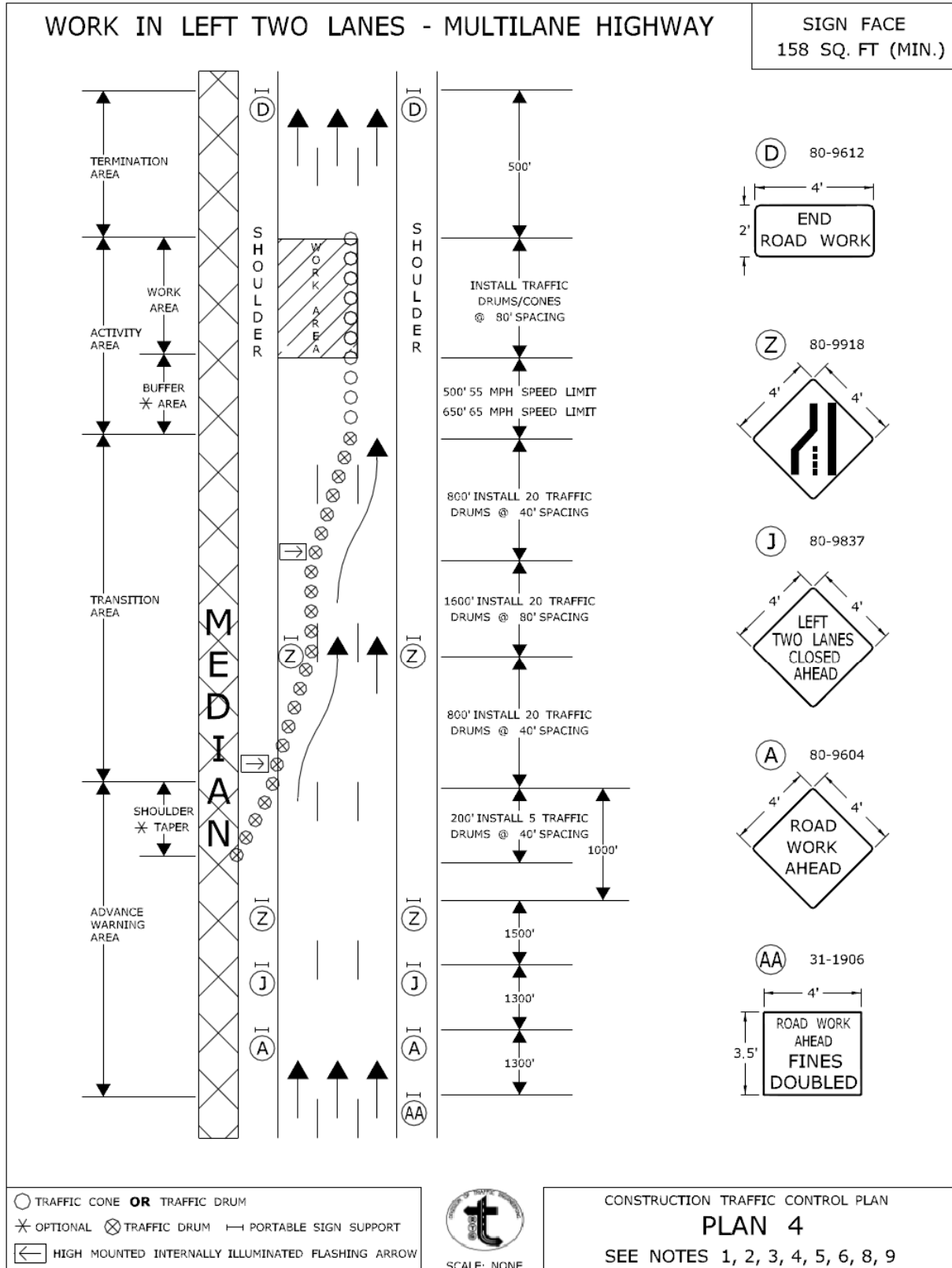
SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 2
SEE NOTES 1, 2, 3, 4, 5, 6, 8, 9

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED *Charles S. Harlow*
PRINCIPAL ENGINEER
Charles S. Harlow
2012.06.05 15:51:23-04'00"





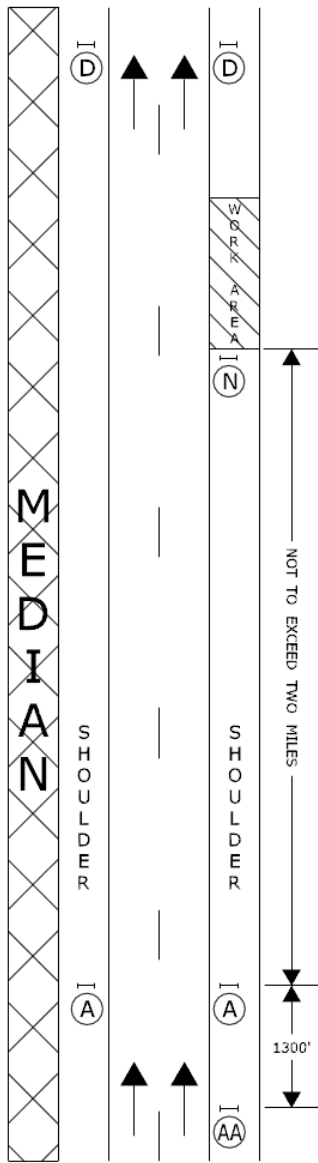
CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 4
SEE NOTES 1, 2, 3, 4, 5, 6, 8, 9

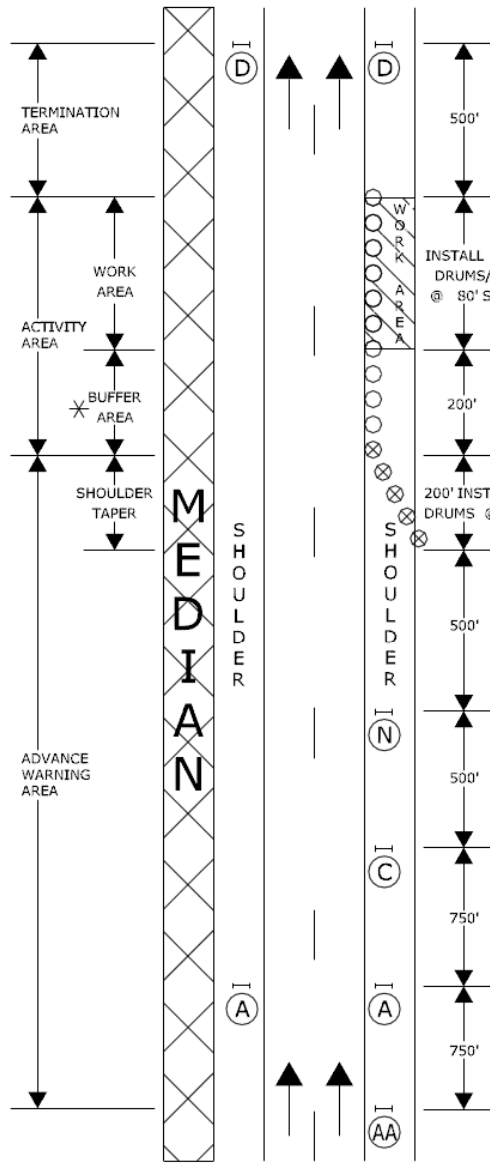
APPROVED *Charles S. Harlow*
PRINCIPAL ENGINEER Charles S. Harlow
2012.06.05 15:52:10-0400

WORK IN SHOULDER AREA - MULTILANE HIGHWAY

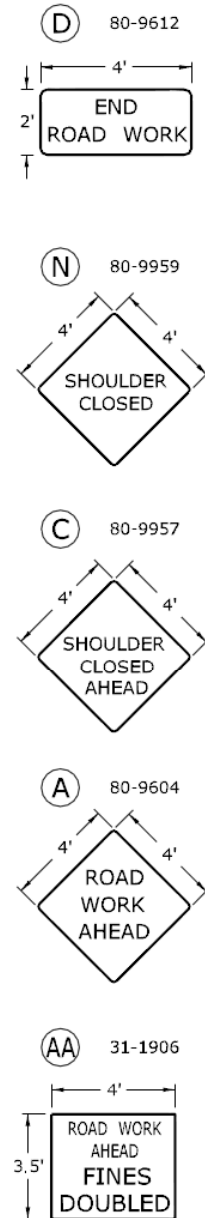
SIGN FACE
94 SQ. FT (MIN.)



MOVING OPERATION



STATIONARY OPERATION



- TRAFFIC CONE OR TRAFFIC DRUM
- ✱ OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN

PLAN 6

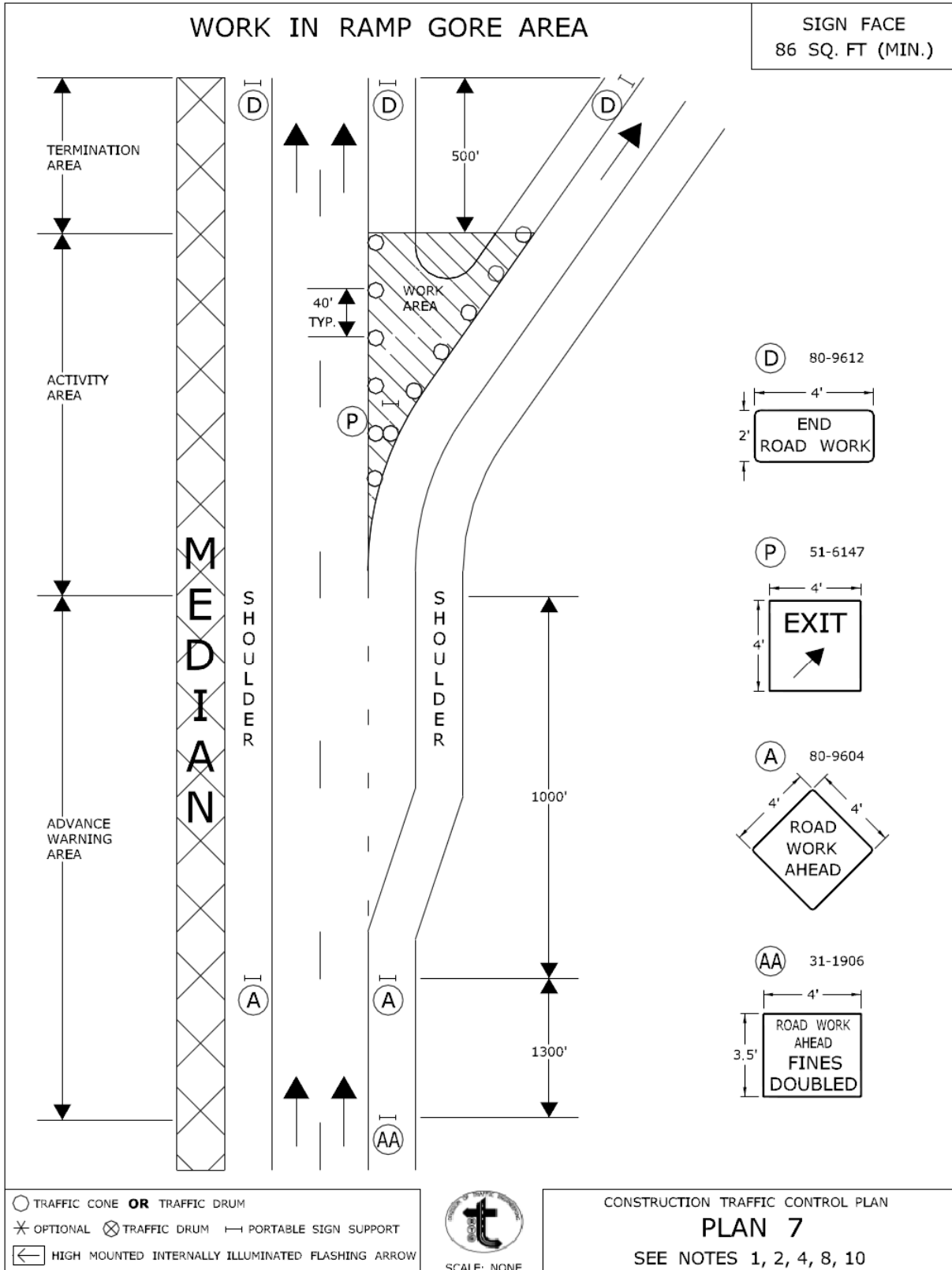
SEE NOTES 1, 2, 4, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

Charles S. Harlow
PRINCIPAL ENGINEER

Charles S. Harlow
2012.06.05 15:52:38-04'00"



CONNECTICUT DEPARTMENT OF TRANSPORTATION
 BUREAU OF ENGINEERING & CONSTRUCTION



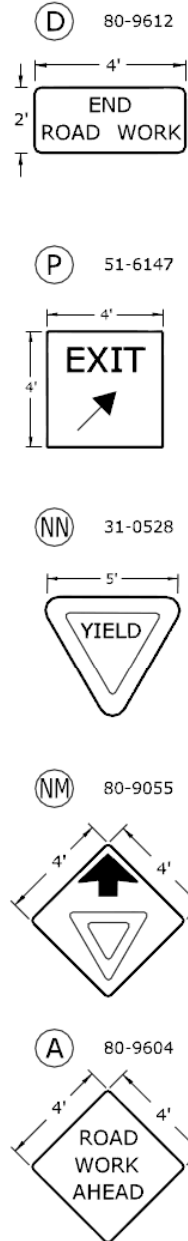
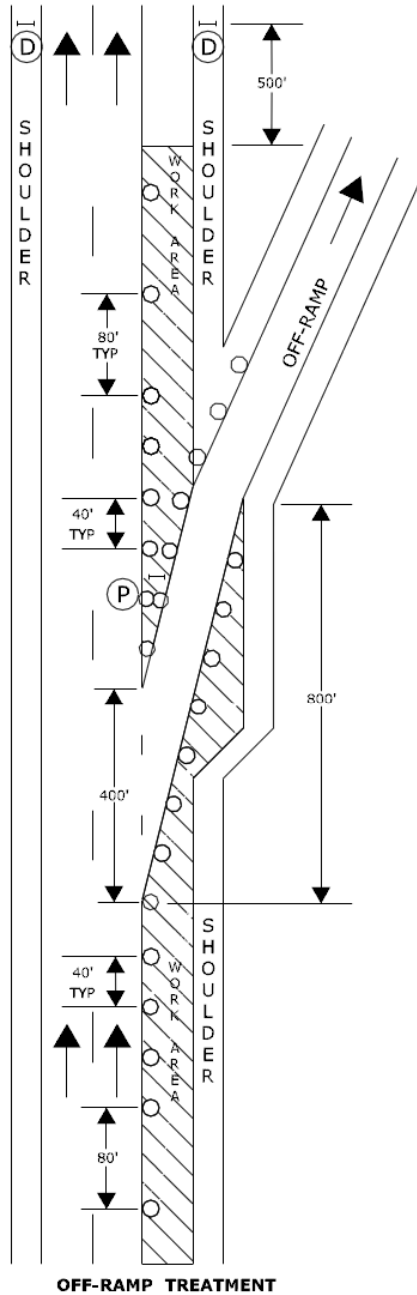
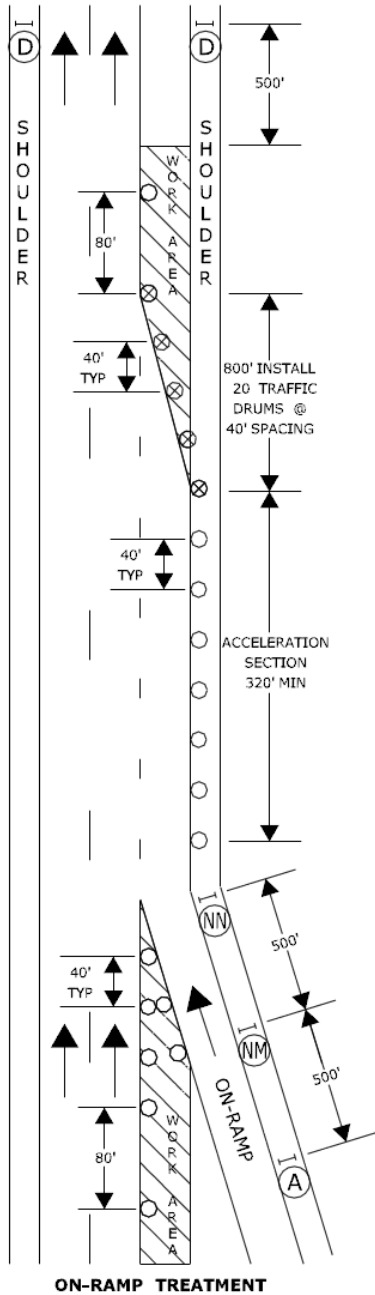
SCALE: NONE

APPROVED *Charles S. Harlow*
 PRINCIPAL ENGINEER

Charles S. Harlow
 2012.06.05 15:53:03-0400

TYPICAL RAMP TREATMENTS FOR MAINLINE LANE CLOSURE - MULTILANE HIGHWAY

SIGN FACE SQ. FT VARIES



USE TRAFFIC CONTROL PLAN 1 TO CLOSE THE RIGHT LANE

- TRAFFIC CONE OR TRAFFIC DRUM
- ✱ OPTIONAL ✕ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN

PLAN 8

SEE NOTES 1, 2, 3, 4, 5, 6, 8, 9, 10

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

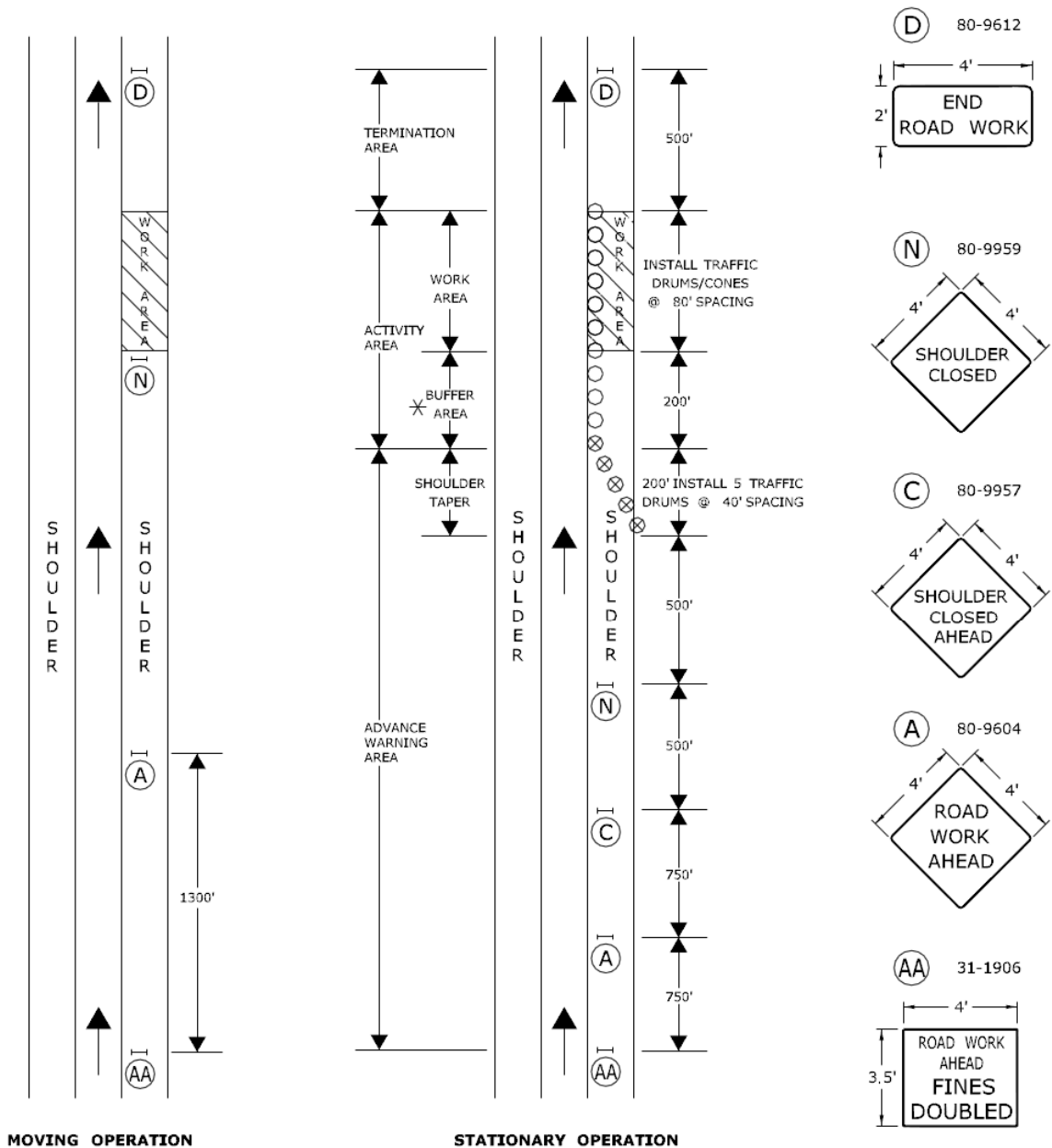
APPROVED

Charles S. Harlow
PRINCIPAL ENGINEER

Charles S. Harlow
2012.06.05 15:53:31-0400

WORK IN SHOULDER AREA - TURNING ROADWAYS / RAMPS

SIGN FACE
70 SQ. FT (MIN.)



- TRAFFIC CONE **OR** TRAFFIC DRUM
- * OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN

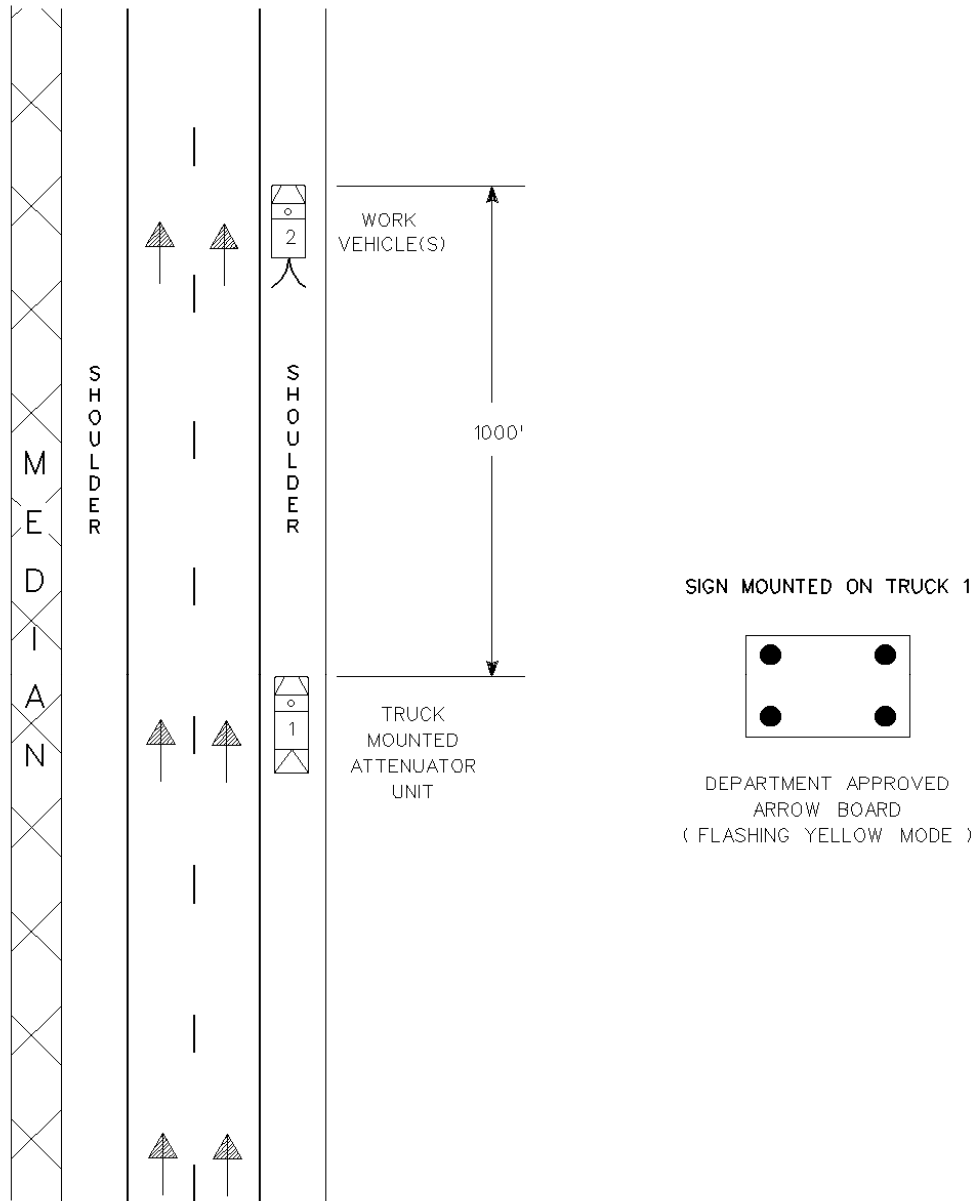
PLAN 9

SEE NOTES 1, 2, 4, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED *Charles S. Harlow*
PRINCIPAL ENGINEER
2012.06.05 15:53:0400'

MOVING OPERATION ON RIGHT SHOULDER MULTILANE HIGHWAY & SECONDARY ROADWAYS



REV'D 1-02

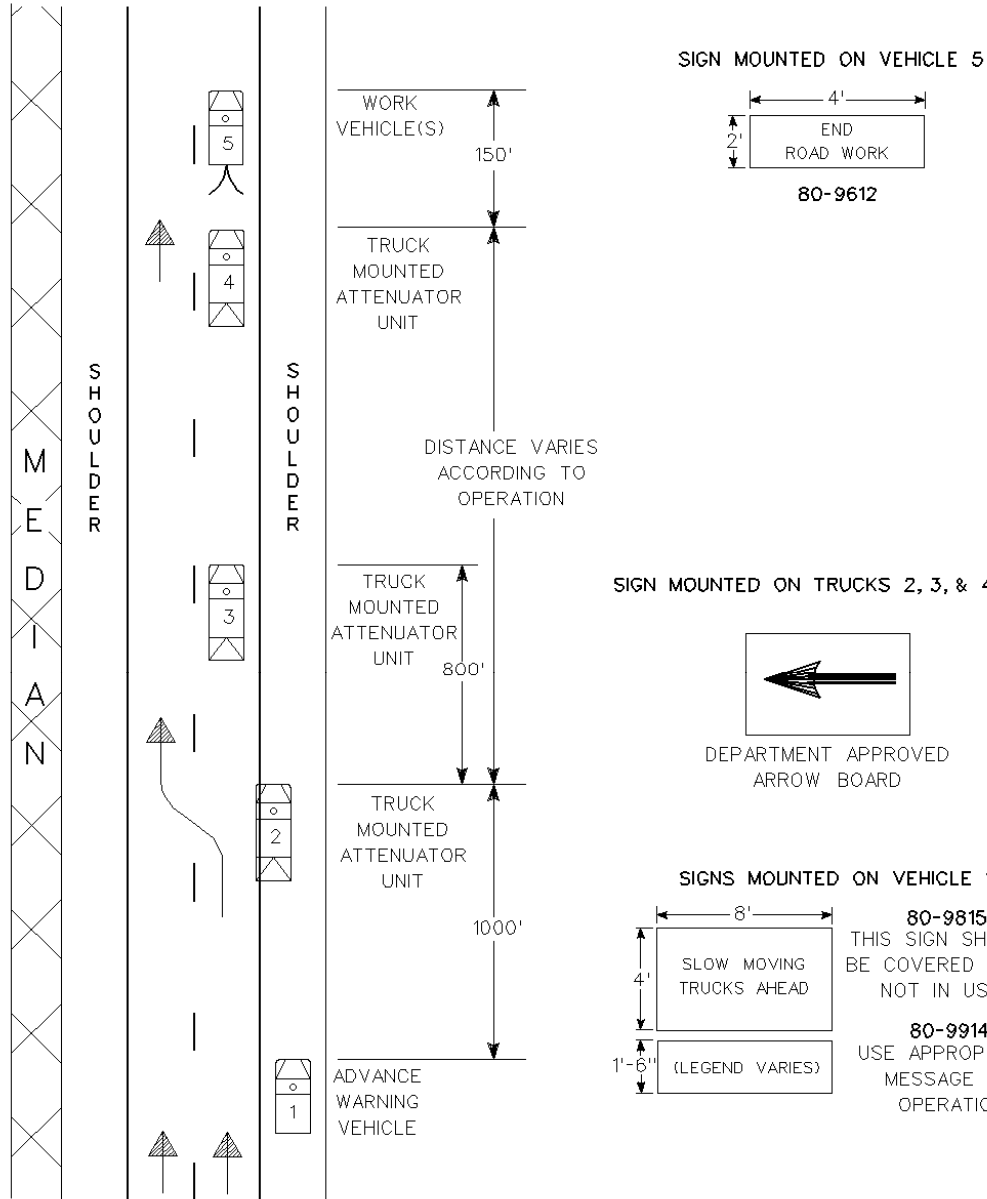


CONNECTICUT
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BUREAU OF ENGINEERING &
HIGHWAY OPERATIONS
DIVISION OF TRAFFIC ENGINEERING

CONSTRUCTION
TRAFFIC CONTROL PLAN
PLAN 19
SCALE NONE

APPROVED J. McCall DATE 1-30-02
PRINCIPAL ENGINEER

MOVING OPERATION IN RIGHT LANE
AND OUTSIDE SHOULDER AT THE SAME TIME
MULTILANE HIGHWAY



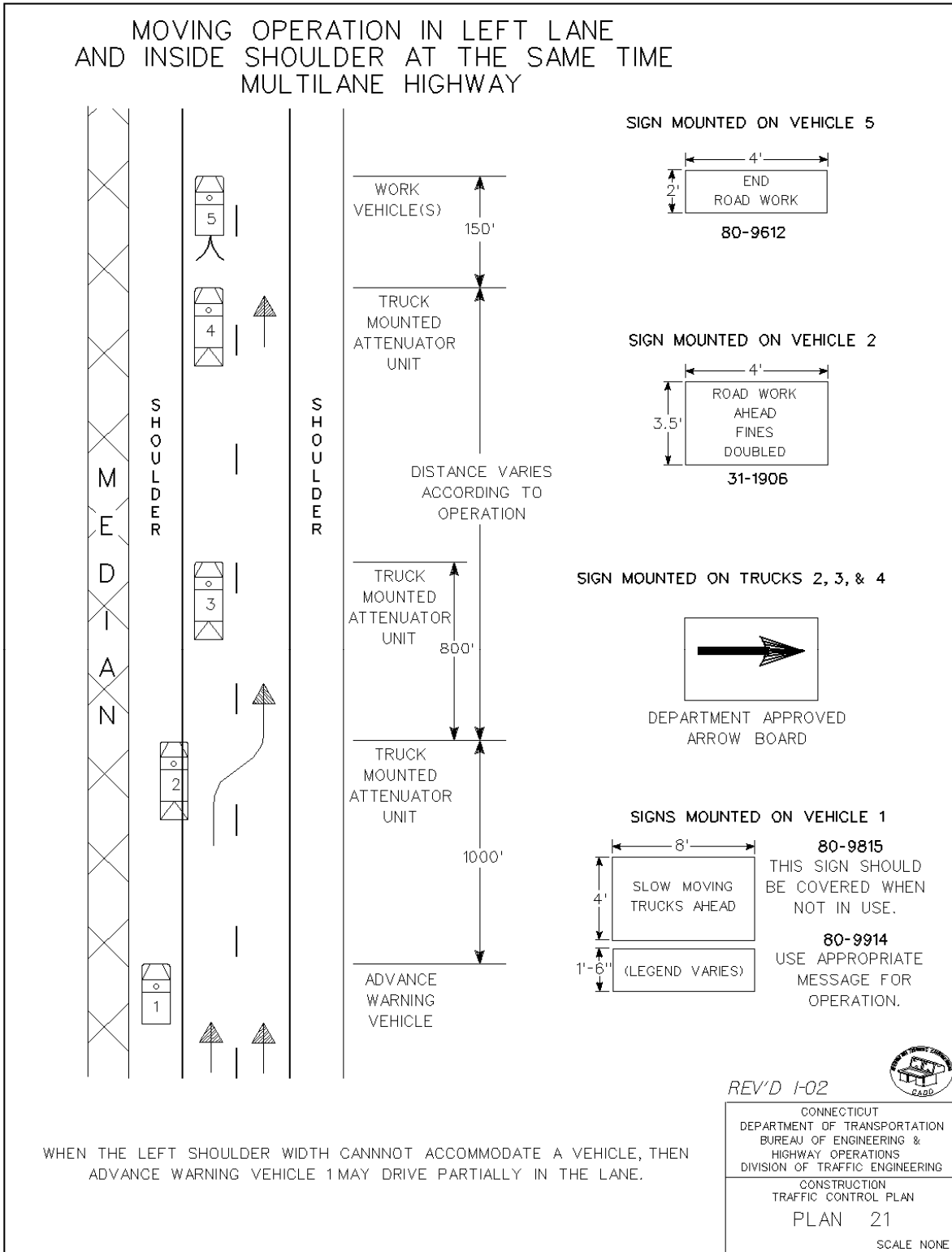
REV'D I-02

CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING &
HIGHWAY OPERATIONS
DIVISION OF TRAFFIC ENGINEERING

CONSTRUCTION
TRAFFIC CONTROL PLAN
PLAN 20

SCALE NONE

APPROVED John D. McCall DATE I-30-02
PRINCIPAL ENGINEER



APPROVED John D. McCall DATE I-30-02
PRINCIPAL ENGINEER

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

The temporary relocation of signs and supports, and the furnishing, installation and removal of any temporary supports shall be paid for under the item “Maintenance and Protection of Traffic”.

The cost of furnishing, installing, and removing the material for the 4H:1V traversable slope shall be paid for under the item “Maintenance and Protection of Traffic.”

ITEM #1008308A – 2" FIBERGLASS CONDUIT IN STRUCTURE

ITEM #1008664A – 2" FIBERGLASS CONDUIT IN TRENCH

DESCRIPTION: This item shall consist of furnishing and installing fiberglass conduit of the size and type specified with necessary fittings within a trench or cast in concrete, at the locations shown on the plans or as directed by the Engineer and in accordance with this specification.

Work under the above items shall conform to Section 10.08 of the standard specifications, supplemented and amended as follows:

MATERIALS: The 2" fiberglass conduit shall be standard wall type with a minimum wall thickness of 0.070 inches. The conduit shall be reinforced thermosetting resin conduit using the single circuit filament winding process and shall be free from defects including non-circularity and foreign inclusions. The conduit shall be nominally uniform (as commercially practical) in color, density, circularity, and physical properties and shall be straight with the ends cut square to the inside diameter. Each section of conduit shall be supplied with an overall length of 20'. The conduit color shall be black.

The complete conduit system shall be UL listed and shall meet or exceed the requirements of UL 2420 below ground standard and CSA-22.2 No. 211.3-96 standard. All conduit, elbows and fittings shall be durably and legibly marked in accordance with NEMA TC 14-2002.

All conduit joints shall be interference type and shall be permanently bonded using a joint adhesive supplied by the conduit manufacturer. The joint adhesive shall be applied to the conduit as specified by the manufacturer. The resin system shall be epoxy anhydride-cured with no fillers.

A complete line of fittings, adapters, and elbows shall be available and shall be manufactured from the same materials and manufacturing process as the conduit.

The conduit shall have an operating range of -40F to +250F and shall contain a ultra-violet (UV) inhibitor to meet the appropriate UL, CSA or NEMA specification.

The Contractor shall submit shop drawings to the Engineer for approval in accordance with Section 1.06.01.

CONSTRUCTION METHODS: All conduit joints shall be glued together using the Manufacturer's recommended adhesive as well as the Manufacturer's recommended procedure. The surface of the conduit shall be dry and clean, free of dust, moisture, oil, grease, or any other contaminant. Any field cuts in the conduit shall be hand sanded to remove the resin glaze and to ensure proper mechanical adhesion. The adhesive shall be applied only within the temperature

range as specified by the Manufacture. The adhesive shall be applied in conformance with the Manufacturer's recommendations and in such a manner as to avoid "ponding" and voids which will result in weak joints. The Contractor shall ensure that no adhesive has formed on the interior wall of the conduit. Once the adhesive has set, the Contractor shall hand test the joint for proper connection. Any joints which are loose, cracked, or exhibit poor adhesion shall be cut out and re-made.

For conduit in trench: Trenches shall be of the depth and cross section shown on the plans with a minimum covering of 24". Trenching and backfilling shall be paid for under a separate bid item.

For conduit in structure: It shall be the Contractor's responsibility to coordinate the setting of the conduit in the structure wall prior to pouring the concrete. Proper rodding/compaction of the concrete around the conduit where it connects to a junction box shall be carried out to prevent voids and honeycombing. The fiberglass conduit shall be securely attached to the cast iron junction box using a threaded box connector and galvanized locknuts. The free end of the fiberglass conduit sweep shall be directed into the fill area behind the adjacent guide railing and shall terminate at a depth of 24" below finished grade. The end of the conduit sweep shall be temporarily capped with a conduit cap (non-glued) to prevent entry of dirt and debris into the conduit sweep.

METHOD OF MEASUREMENT: The conduit shall be measured for payment by the actual number of linear feet of the type and size installed, complete and accepted. Fixed sweep-bends and assorted fittings will not be measured for payment but shall be included in the pay item for the conduit of the type and size specified. The measured length shall be from end to end along the centerline through all fittings.

The pull tape and conduit testing will not be measured for payment but shall be included in the pay item for the conduit of the type and size specified.

BASIS OF PAYMENT: This work shall be paid for at the contract unit price per foot for "2" Fiberglass Conduit in Structure" or "2" Fiberglass Conduit in Trench" within the limits shown on the plans and in the details. This price shall include all materials required including conduit, couplings, threaded connectors, elbows, fixed sweep-bends, conduit fittings, caps, pull-rope, adhesive, sanding, equipment, tools, labor, and all work incidental thereto.

ITEM #1008860A – 4” (100 MM) FIBERGLASS MULTIDUCT CONDUIT – EXTRA HEAVY WALL

DESCRIPTION:

The mainline fiberglass conduit shall be a 4” multi-duct conduit system designed and engineered for installation underneath or on the outside of the parapet or beam of a structure terminated by ground mounted pullboxes, vaults or manholes. The multiduct concept shall maximize duct usage by compartmentalization of cables for current requirements and for future expansion.

The mainline conduit shall contain four (4) factory installed 30 mm innerducts within a 4” outer duct. As part of this item, the Contractor will be required to test the integrity of the conduit with a poly-line and to install pull tape as required in the specification.

Work under the above items shall conform to Public Utility Commission Rules and Regulations, where applicable, and to Section 10.08 of the standard specifications, supplemented and amended as follows:

MATERIALS:

The multi-cell conduit system shall be a pre-assembled conduit manufactured from a 100 mm round outerduct containing 4 factory installed innerducts. The innerducts shall be held together in a square configuration by a system of spacers, bands, or other mechanism. The coupling system shall be resistant to water infiltration, air loss during cable installation, and shall be capable of locking the system tightly together to not allow free twisting of the innerducts.

Outerduct:

The conduit shall be free from defects including non-circularity and foreign inclusions. It shall be nominally uniform (as commercially practical) in color, density, and physical properties. It shall be straight and the ends shall be cut square to the inside diameter. Fiberglass conduit and fittings shall be supplied with an ultraviolet inhibitor. The color of the outerduct shall be a gray that matches as close as possible the color of the parapets of the structures. The Contractor will be required to submit a color swatch for approval.

The complete conduit system shall be UL listed, designed and engineered for an outdoor plant application. Protective outer duct shall be filament wound fiberglass reinforced epoxy as manufactured to comply with the specifications outlined in NEMA TC-14 and UL 1684 as noted.

The extra heavy wall fiberglass conduit shall have a minimum wall thickness of ¼ in. (6.35 mm). The extra heavy wall conduit shall prevent the penetration of a .45 caliber slug fired from a distance of 20 ft. (6.1 meters). The protective outer duct shall have extended 6 in. (150 mm) integrally wound bell ends and shall be shipped in a minimum lay length of 20 ft. (6.1 meters). The outer duct shall have a longitudinal running print line to assure proper innerduct orientation and alignment. This line shall consist of the following wording: “Install This Side Up –

Connecticut D.O.T. Cable – For Assistance Call 860-594-3447”. The outer duct shall be marked with data traceable to plant location, date, shift, and machine of manufacture.

<u>PHYSICAL AND MECHANICAL PROPERTIES</u>	<u>TEST METHODS</u>
Ultimate Tensile Strength – 11,000 PSI Min.	ASTM D 2105
Dielectric Strength – 500 Volts/Mil.	ASTM D 149
Water Absorption – 1% Max.	ASTM D 570
Specific Gravity – 1.9-2.0	ASTM D 792
Glass Content – 68 ± 2 %	API SPEC 15 LR
Barcol Hardness – 58-52	ASTM D 2583

The outer duct shall have a circumferential ring on the spigot end of the ducts so as to provide a reference point for ensuring the proper insertion depth when connecting conduit ends. Both ends of the conduit shall be capped to protect inner-duct during shipment and job site storage.

The fiberglass conduit system to be utilized shall be a complete system and the Contractor shall provide the following fittings:

- Coupling Kits
- Terminator Kits
- Lubrication Fittings
- Repair Kits
- Installation Accessories

A complete line of fittings, adapters, and elbows shall be available and shall be manufactured from the same materials and manufacturing process as the conduit. The multi-cell conduit shall be joined by use of a coupling system that effectively seals the outerducts and innerducts but allows for expansion or contraction in the system.

All multicell conduit entering and exiting conduit termination points shall have a terminator installed that is made of PVC with an anti-reversing gasket that prevents ingress of water and debris into the outer conduit and the innerduct.

Couplings:

The couplings shall allow for transitions from fiberglass conduit to rigid metal conduit to flexible sweeps to PVC conduit and any combination thereof. The coupling body shall have a factory assembled, multi-stage gasket that is anti-reversing for sealing both the outer and innerduct. A secondary, mid-body gasket shall be seated at the shoulder of the bell to assure 100psi (690 kPa) air pressure (in accordance with Bellcore GR 2884 Issue 1) and watertight integrity with minimum joint infiltration of 6 psi (41 kPa). This will allow for the use of Air-Jet technology to be used in the placing of cables.

The coupling body shall be designed so that when the conduit is joined, the outer walls of the innerducts and the inner walls of the outerduct shall be sealed, providing an airtight seal from within the innerduct system and a watertight seal from the outside of the outerduct. The coupling body shall be tested for water tightness and air-tightness in accordance with Bellcore

GR-2884-CORE Issue 1, July 1995 (R3-41 for water-tightness and R3-43 for air-tightness). The coupling body shall conform to the following requirements:

- Watertightness: 6 psi(41 kPa) minimum
- Air Tightness: no significant leakage at 100 psi (690 kPa).

The system shall be designed so that expansion and contraction of the inner-duct shall take place in the coupling body, and the fittings shall allow going from steel to PVC without compromising air/water tightness, or pulling capabilities. The coupling body shall be factory assembled in the bell end of the outer duct and shall be manufactured from high impact engineered thermoplastic. The coupling body face shall be supplied with lead-ins to facilitate assembly. The coupling body shall have each conduit entrance identified with a raised number and the white inner duct locator conduit entrance shall have raised ribs that can be felt through a glove.

The conduit system shall be designed so that the assembly of components can be accomplished in the following steps:

- a. Loosen set screws on coupling spin back to allow for insertion
- b. Insert male into female and spin coupling forward to bottom
- c. Tighten set screws

Flexible Sweeps:

The conduit system shall offer a complete line of fixed and flexible sweep bends with system compatible bell and spigot ends. The conduit system shall offer and the Contractor shall utilize the following standard fixed sweep bends:

Radius	Bend	System
4 ft & 3 ft. (1200mm & 900mm)	11.25°,22.5°,45°,90°	4-way

Note: Direction changes shall not exceed 90 degrees.

The flexible sweep bend shall be supplied in two lengths to meet field requirements. They shall have a steel core with a PVC outer jacket and be UL listed for exposed and direct burial installation. The inner duct shall always remain flush to the end of the flexible elbow, even when bending.

Length Feet (Meters)	Radius Feet (Meters)	Bend degrees (°)	System
10 (3.2)	4 (1.2) min	0-90	4-way
10 (3.2)	6 (1.8)	0-70	4-way
10 (3.2)	9 (2.7)	0-55	4-way
16 (4.9)	4 (1.2) min	0-90	4-way
16 (4.9)	6 (1.8)	0-70	4-way
16 (4.9)	9 (2.7)	0-55	4-way

All bends, including flexible sweeps, shall have a minimum radius of 3 ft. (900 mm). The inner duct system shall be solvent welded to the coupling body; supported by a movable spacer every 4 ft. (1.32 m). The bends shall not violate the minimum bend radius of the fiber optic cable to be installed.

All bends shall have nylon inner ducts, or approved equivalent, installed to prevent burn-through in accordance with test procedure outlined in Bellcore GR-2884 Issue 1 Section R3-35 and R3-36.

Innerduct:

The innerducts in straight lengths shall be manufactured from PVC or high density polyethylene (HDPE). Innerducts shall be factory treated with atomized silicone or manufactured in a manner to reduce friction during pulling of fiber optic cable.

Innerduct to be used in bends and sweeps shall have a minimum burn through time of 90 minutes when tested in accordance with Bellcore GR-2884 Issue 1 Section R3-35, and R3-36.

PVC inner ducts shall not be allowed in bends and sweeps.

The innerducts shall have a permanent dry lubricant extruded within the inner wall and shall incorporate longitudinal ribs within the inner wall. The innerducts shall have a nominal size of 1.25" (30 mm) and shall consist of 4 unique colors: white, red, orange, and yellow. Innerduct colors shall be oriented in a clockwise direction as specified above, looking at the spigot end of the multi-cell conduit system. The white innerduct shall be located directly under the print line on the outerduct.

Each inner-duct shall be sealed with an expanding Neoprene Plug that withstands 22 psi (150 kPa) and seals the inner-duct from water and debris infiltration, and a provision for tying off a pull line.

Conduit Testing:

The poly-line installed to verify the integrity of the conduit system shall be ¼" (6 mm) polypropylene. The pull tape shall consist of polyethylene or PVC jacket woven into the polyester tape. The pull tape shall be NEPTCO Part No. WP1250P, or approved equal, for cable sizes of less than 97 fibers. NEPTCO Part No. WP1800P, or approved equal, shall be used for cable size of 97-288 fibers.

The pull tape shall have the following properties:

- Proper tensile strength for the required fiber installation, or 1250 lbs. minimum
- flat, not round, construction
- printed foot markings
- Pre-lubricated for reduced pulling tension at start of cable pull
- Low susceptibility to absorption of moisture; moisture resistant

Structure Mounted Conduit Supports

For applications in which the multi-cell conduit system is specified on the plans and/or by the Engineer to be attached to a bridge or other structure, bridge hanger assemblies and conduit support devices shall be required as shown on the details for these attachments. These hanger assemblies and support devices shall be designed for application to the specific bridge or structure for which they will be used, and their materials and design shall be approved by the Department prior to their use.

Threaded rods, anchor bolts, nuts and washers shall conform to ASTM A449 and shall be galvanized in accordance with ASTM A153.

All hex nuts shall be “Prevailing Torque Reusable Type Lock Nuts.”

Bedding material for all conduits shall be No. 100 fine aggregate as defined in Section M.03 of the standard specification and backfill for the pits shall be pervious structure backfill conforming to Article 2.16.02.

When the Contractor core drills through abutment back walls, wing walls and retaining walls, the conduit within the wall shall be Rigid Metal. Fiberglass conduit will only be installed underneath the structure, not within the walls.

Construction Methods

Construction methods shall conform to Article 10.08.03 of the Standard Specifications and to the manufacturer’s instructions.

The Contractor shall layout the trench for the conduit in conjunction with the installation of pullboxes, vaults, or manholes. When installing the conduit, the Contractor shall be aware of the location of the proposed conduit terminal point when they are at a sufficient distance from the terminal point to allow for adjustment of the trench so that the conduit will line up flush with the applicable entry point. Flexible conduit will not be used indiscriminately.

Fiberglass conduit shall extend 2” (50 mm) into the manhole/vault/pullbox for installation of grounded end bushings.

Conduits and innerduct entering conduit terminal points or where terminated in trench, shall be capped or sealed to prevent ingress of water and debris into the conduit. At each conduit terminal point, a PVC coupling body with an anti-reversing gasket that seals between the innerduct and the conduit shall be used. Conduits containing innerduct shall be plugged using a quadplex expansion plug inside the conduit around the innerduct. Each innerduct shall be sealed with an expanding Neoprene Plug that withstands 22 psi (150 kPa) and seals the innerduct from water and debris infiltration, and a provision for tying off a pull line. Innerduct containing one cable shall be plugged using an expandable cable seal off.

Structure Mounted Conduit Supports

The Contractor will be required to submit to the Engineer for approval a proposal detailing the proposed installation method of the surface mounted conduit including the spacing between the conduit supports. The Contractor shall support the conduit as recommended by the manufacturer and approved by the Engineer.

Surface mounted conduit shall be installed where indicated on the plans; using mounting brackets and/or clamps as detailed on the plans or as directed by the Engineer.

Anchor bolts for conduit supports shall be drilled and anchored into sound concrete only. The anchorage system shall be installed per the manufacturers' recommendations. If existing reinforcement is encountered during drilling, the hole shall be abandoned, filled with non-shrink grout and relocated as directed by the Engineer. After installation of the conduit support, tighten all chemical anchor bolts to the torque as recommended by the anchorage system manufacturer.

Shop Drawings:

Prior to beginning work and fabrication of any materials, the Contractor shall take all field measurements necessary to assure the proper fit of the finished structure mounted conduit. This shall include all supports, brackets and hangers, fixed and flexible sweep bends, expansion/contraction fittings, junction boxes, and other structure mounted appurtenances. The Contractor shall submit shop drawings to the Engineer for approval in accordance with Article 1.05.02(b).

- a. Layout plans and other pertinent information, including conduit lengths, locations and type of supports, sweep-bends, expansion fittings, junction boxes, etc. for each bridge or sign support that has structure mounted conduit and appurtenances.
- b. Commercial items shall be identified by manufacturer, trade name and catalog number. Catalog sheets, including pertinent specifications, shall be included with the submission.
- c. Complete fabrication details, including material and galvanizing specifications, for all conduit supports, brackets and hangers, hardware, field fasteners including chemical anchorages, etc.
- d. All field measurements shall be submitted for reference to the reviewer.

Pull Tape

The Contractor shall install pull tape, by hand pulling, blowing, or via vacuum method, into each empty conduit and empty cell within the multi-cell conduit. The intention of this installation is to verify the integrity of the completed system; therefore, this testing will only be allowed to commence once the conduit system has been completely installed. Testing shall be performed in the presence of the Engineer. The Engineer will document the date, time, and the results of the testing and shall submit this information to Highway Operations for record keeping purposes. The Contractor shall neatly coil and secure 10 ft. (3 meters) of slacked pull tape in each vault location. The pull tape shall be field installed within each innerduct for the purpose of attaching to, and pulling of, the fiber optic cable.

As -Built Plans:

The Contractor shall advise the Engineer of any change of measurement of layout of the Plans submitted to them. Upon completion of construction but prior to acceptance of the contract, the Contractor shall furnish as-built plans on 2' X 3' (55 cm by 91 cm) standard plan sheets. All construction changes, with the final location and depth of the conduits, etc. shall be shown in sepia or other reproducible format. These plans shall include all field installations. One sepia or other reproducible of the Project Plans will be provided to the Contractor for their use. Any other base maps that may be necessary for the Contractor to comply with this requirement shall be the Contractor's responsibility.

Method Of Measurement:

The conduit shall be measured for payment by the actual number of feet (meters) of the type and size installed and accepted. Expansion fittings, fixed and flexible sweep-bends, conduit fittings, will not be measured for payment but shall be included in the pay item for the conduit of the type and size specified. The measured length shall be from end to end along the centerline through all fittings.

Core drilling through abutment back walls, wing walls and retaining walls, including the placement of the joint seal around the conduit at the front and rear face of the walls shall be included in the cost of the Fiberglass conduit of the type and size specified. The Rigid Metal conduit within the walls shall be measured for payment by the actual number of feet (meters) of the type and size installed and accepted.

All work necessary to complete the attachment of the conduit, including but not limited to mounting brackets, clamps, hangers, anchors, bolts, etc. to the structures, will not be measured for payment but shall be included in the pay item for the conduit.

The pull tape and conduit testing will not be measured for payment but shall be included in the pay item for the conduit of the type and size specified.

Basis Of Payment:

This work shall be paid for at the contract unit price per foot (meter) for conduit of the size and type indicated, within the limits shown on the plans and in the details. This price shall include all materials required including expansion fittings, fixed and flexible sweep-bends, conduit fittings, pervious structure backfill, bedding material, boxes, caps, pull-rope, inserts, warning tape, ground wire, identification posts with signs, structural supports, equipment, tools, labor and work incidental thereto. Trenching and backfilling shall be paid as specified in Section 10.01 of the Standard Specifications.

Pay Item	Pay Unit
4" Fiberglass Multiduct conduit – Extra Heavy Wall	l.f.

ITEM #1008901A - REMOVE CONDUIT

DESCRIPTION: This item shall consist of the removal of existing surface mounted conduit that are attached to a bridge structure. The limits of conduit removal shall be as indicated on the plans or as ordered and in accordance with these specifications. The removed conduit shall remain the property of the Contractor.

CONSTRUCTION METHOD: The Contractor shall remove surface mounted conduit with conductors from the bridge structure as indicated on the plans or as directed. This item shall also include the removal of any surface mounted junction boxes and conduit bodies associated with the conduit to be removed. The Contractor shall only remove the conduit once the new conduit and conductors have been installed and are supplying power to the bridge electrical systems (new conduit, conductors and navigation lights to be paid for under separate bid items).

Removed conduit with conductors shall be properly disposed of by the Contractor.

METHOD OF MEASUREMENT: This work will be measured for payment by the actual number in linear feet of conduit removed.

BASIS OF PAYMENT: This work will be paid for at the contract unit price per linear foot for "Remove Conduit" which price shall include the removal of the conduit with conductors, surface mounted junction boxes, cutting, removal of clamps, disposal, and all equipment, labor and work incidental thereto.

ITEM# 1008908A - CLEAN EXISTING CONDUIT

Description:

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

Construction Methods:

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

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

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

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

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

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

Method of Measurement:

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

Basis of Payment:

The work under the Item "Clean Existing Conduit" shall be paid for at the contract unit price per linear foot, which price shall include all material, tools, equipment, labor, and work incidental thereto. Replacement of any damaged conduit shall be paid for under the applicable conduit item.

Pay Item
Clean Existing Conduit

Pay Unit
l.f.

ITEM #1010060A – CLEAN EXISTING CONCRETE HANDHOLE

DESCRIPTION: Under this item the Contractor shall clean all debris from an existing concrete handhole where shown on the plans or as directed.

CONSTRUCTION METHODS: The Contractor shall remove all sand, silt and other debris from within an existing concrete handhole where shown on the plans or as directed. Debris shall be removed to a level of 12” below the incoming electrical conduit. Removed debris shall be properly disposed of by the Contractor. Where new conductors are to be installed in existing rigid metal conduit entering the handhole, the Contractor shall remove the old insulated bonding bushing from the end of each conduit and install a new insulated bounding bushing.

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

BASES OF PAYMENT: This work will be paid for at the contract unit price each for "Clean Existing Concrete Handhole", which price shall include the removal and disposal of debris from handhole, removal of existing bonding bushings, furnishing and installing new insulated bonding bushings, and all equipment and work incidental thereto.

ITEM #1014401A – FUSE CONNECTOR

DESCRIPTION: This item shall consist of furnishing and installing a non-breakaway fuse connector with fuse or brass slug in a parapet junction box to feed a navigation light.

MATERIALS: Fuse connectors shall conform to the requirements of Article M.15.05 with the exception of being non-breakaway type. Fuse connectors shall have a rubber or molded plastic housing which is watertight. Fuse connectors shall be rated for 600 volts. Conductor terminals shall be crimp type.

CONSTRUCTION METHOD: The Contractor shall install a fuse connector in the parapet mounted junction box (paid for under a separate bid item) to feed the navigation light. Each navigation light shall be fed by two fuse connectors. The fuse connector connected to the “hot” leg shall contain a 10 amp fast-acting fuse. The fuse connector connected to the neutral leg shall contain a brass slug.

The fuse connector shall be connected to the branch circuit via a taped split-bolt connector as indicated in the plan details. The split-bolt connector shall be paid for as part of the conductor item.

METHOD OF MEASUREMENT: This work will be measured for payment by the number of fuse connectors of the type specified, installed, complete and accepted.

BASIS OF PAYMENT: This work will be paid for at the contract unit price each for "Fuse Connector", complete and accepted in place, which price shall include all materials including fuse connector, fuse, brass slug, connections, crimping, and all labor, tools, equipment and work incidental thereto.

ITEM #1014901A - REMOVE CABLE

DESCRIPTION: This item shall consist of removing conductors and cables from existing cabinets, conduit and handholes where indicated in the plans or as directed by the Engineer and in accordance with these specifications. The removed conductors and cables shall remain the property of the Contractor.

CONSTRUCTION METHOD: The Contractor shall remove all conductors and cables from existing cabinets, conduit and handholes at the location where new conductors and cables are to be installed. Prior to installing the new conductors and cables, all existing conductors and cables shall have been removed, neatly coiled, tied and the conduit reamed cleaned. The removed conductors and cables shall be disposed of by the Contractor.

Nighttime illumination shall not be interrupted by this work.

METHOD OF MEASUREMENT: This work shall be measured for payment by the actual number of linear feet of conduit from which all conductors are removed, also including the length of handholes, junction boxes, and cabinets.

BASIS OF PAYMENT: This work will be paid for at the contract unit price per linear foot for "Remove Cable" which price shall include the removal of all conductors and cables, the cleaning of conduit, the proper disposal of the removed conductors and cables, and all equipment, labor and work incidental thereto.

ITEM #1018012A – REMOVE, STORE, AND RESET NAVIGATION LIGHT

Description: Under this item the Contractor shall remove, temporarily store as required, and install an existing pivot arm mounted 360-degree green navigation lights or an existing pier mounted 180-degree red navigation lights, completely wired and attached to the bridge structure, in accordance with the plans and specifications.

Materials: The Contractor shall be responsible for damage to all equipment and materials incurred during removal and hauling to the specified area. All repairs or replacements due to damage or loss by the Contractor shall be made at the Contractor's expense. Chemical anchoring material shall conform to sub article M.03.01-15 and shall be selected from the Department's qualified products list. SOW cord with 3#10 conductors shall be installed to the reinstalled navigation light.

Construction Method: The Contractor shall remove the existing 360-degree green or 180-degree red navigation light with all mounting hardware where indicated on the plans, or as directed by the Engineer. The Contractor shall effectively disconnect the navigation light from the lighting circuit.

For the 360-degree green navigation lights, the Contractor shall remove the hanger housing, ring anchor, and associated hardware and remove the navigation light from the anchorage. The 360-degree green navigation light and mounting hardware shall be properly stored as a unit away from traffic and sources of possible damage. Upon installation of the new parapets (paid for under separate bid item), the removed navigation light shall be bolted securely to the parapets in accordance with the plans and specifications.

For the 180-degree red navigation lights, the Contractor shall remove the steel mounting plate, stanchion, and associated hardware and remove the navigation light from the anchorage. The 180-degree red navigation light and mounting hardware shall be properly stored as a unit away from traffic and sources of possible damage. Upon installation of the new pier cap (paid for under separate bid item), the removed navigation light shall be bolted securely to the pier cap in accordance with the plans and specifications.

The navigation light shall be connected to grounding system and connected to the lighting circuit as indicated on the plans.

The Contractor shall make all necessary arrangements with the District Electrical Maintenance Supervisor, for locking and unlocking of the circuits on which any work is to be done, through the Engineer.

The drilled holes and chemical anchors for supports shall be installed in sound concrete per the chemical anchoring material manufacturer's recommendations. Prior to placement of the chemical anchoring material in the holes, the holes shall be cleaned of all dirt, moisture, dust, and foreign material. If existing reinforcement is encountered during drilling, the hole shall be abandoned, filled with non-shrink grout and relocated as directed by the Engineer. After installation of the supports, tighten all chemical anchor bolts to the torque as recommended by the anchorage system manufacturer.

The Contractor shall take field measurements to determine the required length of the SOW cable allowing enough slack in the cable to accommodate the 180° degree rotation of the pivot arm bracket, create a suitable drip loop, and allow for conductor splicing in the adjacent junction box as indicated on the plans.

Connect 3#10 conductors to branch circuit conductors with insulated fuse connectors per Item No.1014401A – Fuse Connector. Connect equipment ground with split bolt type connector.

All work shall be in strict conformance with the National Electric Code.

The Contractor shall carry out this work so that there is no disruption to the proper nighttime navigation lighting of the navigable channel. See Item No. 1018050A.

Method of Measurement: This work will be measured for payment by the number of 360-degree green or 180-degree red navigation lights removed and reinstalled, complete and accepted.

Basis of Payment: This work will be paid for at the contract unit price each for "Remove, Store, and Reset Navigation Light" as specified, which price shall include removal, storage, delivery and installation of the navigation light, drilling, chemical anchors, S.O. cable, connections, and all work, materials, tools and equipment incidental thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
Remove, Store and Reset Navigation Light	EA

ITEM #1018013A – TEMPORARY WATERWAY CONSTRUCTION MARKERS

Description: Work under this item shall consist of furnishing, establishing, constructing, maintaining, and removing all applicable signage and beacons necessary to maintain the safe navigation of the navigable channel and to establish a safe work zone on the waterway. Also included in this item are any modification to the temporary waterway construction markers necessary due to stage construction in the areas around Bridge Nos. 01218 and 04180 as a result of demolition/construction activities. This work includes the driving and removal of piles needed to support any beacons and the preparation of any waterway closure plans required for the construction and demolition of Bridge Nos. 01218 and 04180. Navigation lights required to mark the positions of the Contractor's equipment, the work trestle, and sheeting enclosures are included under this item.

This item also includes fabrication, setting and maintenance of temporary vertical clearance signs for marine traffic.

Materials:

Signage:

All reflective sheeting shall meet the requirements of Section M18.09 of the Form 817.

Lighting:

All temporary lighting on beacons shall be new LED lights rated for marine environments as recommended by the manufacturer. All temporary lights shall be rated IP68 and shall be equipped with an integral photocell that will allow for dusk to dawn operation. Temporary lighting shall be placed to illuminate vertical clearance signs.

Navigation lights to mark the position of the Contractor's equipment, the work trestle, and any other vessel or obstruction shall meet U.S. Coast Guard requirements (33 CFR).

Construction Methods: The Contractor prior to the start of any work on, in, or above the waterway shall establish the required work zone as shown on the plans or as directed by the Engineer. The Contractor shall submit 90 days prior to the establishment of the work zone a Boat Safety Plan identifying any temporary work in the vicinity of the waterway, proposed staging of any work that will affect the boating public or use of the waterway, durations of the proposed work zone and locations of beacons (signs). The Contractor shall maintain a minimum of a 75' wide channel at all times unless prior written permission is granted from the Engineer. The Contractor shall submit a Closure Plan to the Engineer a minimum of 30 days prior to the establishment of the channel closure. Channel closures shall only be permitted Monday – Friday between May 1st and October 1st. All navigation lights shall remain on at all times. Any piles used for support of signage and/or beacons shall be removed. Piles that can't be removed shall be cut off 2' below the mudline.

Vertical Clearance Signs:

Temporary vertical clearance signs are to be fabricated, installed and maintained during the duration of the project. These signs shall be illuminated to a minimum surface value of 5 footcandles. Signs are to meet the requirements of the U.S. Coast Guard and regulatory agencies and be approved by the Engineer prior to fabrication. Signs are to be placed at the center of the navigable channel such that one sign is visible to upstream traffic and the other is visible to down-stream traffic. Relocation of and resetting of this sign to indicate the correct available vertical clearance during the course of construction is included within this work. If approved by the Engineer, the existing/permanent vertical clearance sign(s) may be used to meet this signage requirement.

Method of Measurement: This work, which is to be paid on a Lump Sum basis, shall not be measured for payment.

Basis of Payment: This work will be paid for at the contract Lump Sum price for “Temporary Waterway Construction Markers”, which price shall include all work defined herein and necessary for the furnishing, establishing, constructing, maintaining, and removing all applicable beacons, as well as any modifications necessary due to stage construction to the areas around Bridge Nos. 01218 and 04180 at the location(s) shown on the plans for the purpose of demolishing and constructing the bridges as shown on the plans and establishing a safe work zone on the waterway and all materials, equipment, tools and labor incidental thereto. The preparation of the Boat Safety Plan and any required Closure Plans shall also be included in this item.

PAY ITEM
Temporary Waterway Construction Markers

PAY UNIT
L.S.

ITEM #1018050A - MAINTAINING NAVIGATION LIGHTS

Description:

This item consists of maintaining the navigational lighting required by the U.S. Coast Guard and regulatory agencies in the vicinity of the existing and proposed bridge throughout the duration of construction.

Materials:

Temporary solar powered navigation lights shall be furnished by the following manufacturers or approved equal:

Sealite USA, LLC - 61 Business Park Drive, Tilton, New Hampshire, 03276, (603)-737-1311, www.sealite.com

Model Nos.: 180° red: SL70-180R
360° green: SL-BRK (green)

McDermott Light & Signal – 1639 Stephen Street, Ridgewood, NY, (718)-456-3606, www.mcdermottlight.com.

Model Nos.: 180° red: 9SOL-FM-RED
360° green: Bridge-Tube-LT-(green)-solar

Navigation lights from alternate manufacturers shall conform to U.S. Coast Guard requirements (33 CFR) and provide a visible range of 1 mile or greater. 180° red navigation lights shall feature integral solar modules with NiMH rechargeable batteries. 360° green navigation lights shall be for pendant mounting and shall be powered by a remote battery with remote solar panel. Temporary navigation lights shall be rated IP68 and shall be equipped with an integral photocell that will allow dusk to dawn operation only.

Construction Methods:

Navigation lighting is to be maintained through the use of existing navigation lights, proposed navigation lights or the furnishing, installation and maintenance of temporary solar powered navigation lights with batteries.

This item includes installation of any temporary conduit and wiring to maintain power to existing or permanent navigation lights being used.

Temporary Solar Powered Navigation Lights:

Temporary light fixtures shall be installed and operational prior to termination of electrical service to the existing navigation lights. Temporary navigation lights shall be installed as shown on Drawing No. C-09, Boat Safety Plan.

All temporary light fixtures shall be securely fastened. The Contractor shall furnish and install all necessary material for secure installation and maintenance access to the lights.

The Contractor shall fully maintain the temporary lights throughout their service life at the site, including battery replacement. When no longer required as directed by the Engineer, the Contractor shall remove and properly dispose of the lights and batteries.

Method of Measurement

This work will not be measured for payment. Partial payments will be based on the table below:

Completion of Stage 1	20% of Lump Sum Amount
Completion of Stage 2	20% of Lump Sum Amount
Completion of Stage 3	20% of Lump Sum Amount
Completion of Stage 4	20% of Lump Sum Amount
Completion of All Work Navigation Channel	20% of Lump Sum Amount In

Basis of Payment:

This work shall be paid for at the lump sum price for "Maintaining Navigation Lights" complete in place, which price shall include all items required to maintain navigational lighting during construction including: navigation lights, batteries, battery boxes, lamps, padlocks, keys, conduit, cable, solar panels, pendent mounts, fixed mounting brackets, junction boxes, fittings, conduit bodies, attachment hardware, drilling, anchoring, fabrication, mounting, removal, relocation, maintaining, delivery, and disposal.

ITEM #1206023A - REMOVAL AND RELOCATION OF EXISTING SIGNS

Section 12.06 is supplemented as follows:

Article 12.06.01 – Description is supplemented with the following:

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

Article 12.06.03 – Construction Methods is supplemented with the following:

The Contractor shall take care during the removal and relocation of existing signs, sign posts, and sign supports that are to be relocated so that they are not damaged. Any material that is damaged shall be replaced by the Contractor at no cost to the State.

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

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

Article 12.06.04 – Method of Measurement is supplemented with the following:

Payment under Removal and Relocation of Existing Signs shall be at the contract lump sum price which shall include all extruded aluminum and sheet aluminum signs, sign posts, and sign supports designated for relocation, all new sign posts and associated hardware for signs designated for relocation, all extruded aluminum signs, sheet aluminum signs, sign posts and sign supports designated for scrap, and foundations and other materials designated for removal and disposal, and all work and equipment required.

Article 12.06.05 – Basis of Payment is supplemented with the following:

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

<u>Pay Item</u>	<u>Pay Unit</u>
Removal and Relocation of Existing Signs	L.S.

ITEM #1208931A — SIGN FACE - SHEET ALUMINUM (TYPE IX RETROREFLECTIVE SHEETING)

Section 12.08 is supplemented and amended as follows:

12.08.01—Description:

Add the following:

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

12.08.03—Construction Methods:

Delete the last sentence and add the following:

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

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

12.08.04—Method of Measurement:

Add the following:

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

12.08.05—Basis of Payment:

Replace the entire Article with the following:

This work will be paid for at the Contract unit price per square foot for “Sign Face - Sheet Aluminum” of the type specified complete in place, adjusted by multiplying by the applicable Pay Factor listed in the table below. The price for this work shall include the completed sign, metal sign post(s), span-mounted sign brackets and mast arm-mounted brackets, mounting hardware, including reinforcing plates, field testing, restoration and replacement of defective base post(s), and all materials, equipment, and work incidental thereto.

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

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

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 #1806226A – PRE-WARNING VEHICLE

Description: Work under this item shall include furnishing, deploying and maintaining a Truck-Mounted Impact Attenuator equipped with a changeable message sign (CMS) for use as a Pre-Warning Vehicle (PWV) in a rolling road block operation on limited access highways. Impact attenuators shall only be truck-mounted. The message on the sign shall warn motorists of slow or stopped traffic conditions.

Materials: The Truck-Mounted Impact Attenuator shall meet the requirements of Article 18.06.02, except replace all instances of “flashing arrow,” “arrow sign,” and “arrow” with “CMS”. The CMS shall meet the requirements of Article 11.31.02, with the following amendments:

1. Physical Characteristics of the CMS

- a) Mounting – The CMS shall be truck mounted only
- b) Sign Display Dimensions – Width of 6 feet, height of 4 feet

2. Visual Characteristics of the CMS Display

- a) Sign Type – CMS shall have a LED display only
- b) Color – CMS shall have black background with orange, yellow, or amber legend
- c) Characters – Letter height shall be 13 inches; Single stroke
- d) Visibility– CMS brightness must provide for visibility at 1/2 mile
- e) Message – The message shall read as follows, or shall be as directed by the Engineer:

Frame 1: SLOWED TRAFFIC AHEAD

Frame 2: BE PREPARED TO STOP

Or

Frame 1: STOPPED TRAFFIC AHEAD

Frame 2: BE PREPARED TO STOP

Construction Methods: The PWV shall be initially positioned in the right shoulder ½ mile prior to the rolling road block operation.

If a traffic queue reaches the PWV’s initial location, the Contractor shall slowly reverse the PWV along the shoulder to position itself prior to the new back of queue.

The Contractor shall meet the requirements of Article 18.06.03.

Method of Measurement: This work will be measured for payment by the actual number of hours that the Pre-Warning Vehicle is used in a rolling road block operation.

Basis of Payment: This work will be paid for at the Contract unit price per hour for “Pre-Warning Vehicle,” which shall include the furnishing and use of the pre-warning vehicle and a driver, attenuator reflector, flashing lights, changeable message sign, and all equipment, materials, tools, labor, disposal of damaged Truck-Mounted Impact Attenuator components and work incidental thereto.

Pay Item
Pre-warning Vehicle

Pay Unit
hr

PERMITS AND/OR REQUIRED PROVISIONS:

The following Permits and/or and Required Provisions follow this page are hereby made part of this Contract.

- **PERMITS AND/OR PERMIT APPLICATIONS**

Flood Management General Certification	Approved: October 3, 2019
Inland Wetland General Permit	Approved: October 21, 2019
Army Corps 404 Self Verification Notification	Approved: October 17, 2019
Stormwater General Permit	Pending District 4 Signature

- **Construction Contracts - Required Contract Provisions (FHWA Funded Contracts)**



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

17 October 2019

Regulatory Division
File Number: NAE-2019-02730

Kimberly Lesay
CT DOT Bridge No. 1218 and 4180
2800 Berlin Turnpike
Newington, CT 06131

Dear Ms. Lesay:

PROPOSED WORK/LOCATION: Repair the Existing Bridge Structures for Bridge No. 1218 and Bridge 4180, Newtown/Southbury, CT.

We have reviewed your proposal to perform work within Corps of Engineers jurisdiction. We have assigned this file number **NAE-2019-02730**. Please reference this number in any future correspondence with us.

Since your project may have only minimal individual and cumulative impacts on waters and wetlands of the United States, it is authorized by the Corps of Engineers under the Connecticut General Permits (GPs). This authorization does not obviate the need to obtain other federal, state, or local approvals. You are responsible for ensuring that the work meets the terms and conditions of the CT GPs. We have recorded this project as permittee self-verification of the CT GPs in our database.

Please contact me at (978) 318-8703 if you have any questions.

Sincerely,

A handwritten signature in black ink that reads "Kevin R. Kotelly". The signature is written in a cursive style with a long, sweeping tail on the letter "y".

Kevin R. Kotelly, P.E.
Chief, Permits & Enforcement Branch
Regulatory Division

cc:
CT DEEP, Chief, Land & Water Resources Division – via email

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

FLOOD MANAGEMENT GENERAL CERTIFICATION

Project No.: 096-201
Description: Bridge No. 01218, I-84 EB
Bridge No. 04180, I-84 WB
over Housatonic River

Town: Newtown/Southbury

Date: October 3, 2019

memorandum

to: Mr. Michael E. Masayda
Trans. Principal Engineer
Hydraulics and Drainage
Bureau of Engineering and Highway Operations

from: Andrew J. Cardinali Andrew J. Cardinali, P.E. 2019.10.03 10:05:23-04007
Transportation Supervising Engineer
Bridge CLE Design
Bureau of Engineering and Construction

Please review this request for Flood Management General Certification and indicate your concurrence below.

Certification (to be completed by designer)

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:


- Minor Safety Improvements and Streetscape Projects
- Roadway Repaving, Maintenance & Underground Utilities
- Minor Stormwater Drainage Improvements
- Removal of Sediment or Debris from a Floodplain
- Wetland Restoration Creation or Enhancement
- Scour Repairs at Structures; *(Must acquire DEEP Fisheries Concurrence to be eligible)*
- Guide Rail Installation
- Deck and Superstructure Replacements
- Minor Bridge Repairs and Access
- Fisheries Enhancements
- Surveying and Testing
- Bicycle / Pedestrian, Multi Use Trails and Enhancement Projects

The following required documentation is attached in support of this certification:

- 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 09/27/2019) with FEMA floodplain and floodway boundaries plotted, cross sections and profiles, as necessary, that clearly depict the floodplain involvement
- FEMA 100-year flood elevation plotted on elevation view (for structures)

Print Name: Tracey Brais

Title: Project Manager

Signature: 


Digitally signed by Tracey Brais
DN: cn=US, email=tracey@engr.com, o=CMAA
Associates, Inc., c=Tracy Brais
Date: 2019.10.03 10:05:23-04007

Date: 09/30/2019

Concurrence (to be completed by Hydraulics and Drainage)

Based on the documentation submitted, I hereby concur that the project qualifies for Flood Management General Certification.

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: 

Chong L. Chow, P.E.
for Michael E. Masayda
2019.10.06 11:06:04-04009

Date:

Project No.: 096-201
Description: Bridge No. 01218, I-84 EB
Bridge No. 04180, I-84 WB
over Housatonic River

Town: Newtown/Southbury

Date: October 3, 2019

m e m o r a n d u m

to: Mr. Michael E. Masayda
Trans. Principal Engineer
Hydraulics and Drainage
Bureau of Engineering and Highway Operations

from: Andrew J. Cardinali
Transportation Supervising Engineer
Bridge CLE Design
Bureau of Engineering and Construction

Please review this request for Flood Management General Certification and indicate your concurrence below.

Certification (to be completed by designer)

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:

- Minor Safety Improvements and Streetscape Projects
- Roadway Repaving, Maintenance & Underground Utilities
- Minor Stormwater Drainage Improvements
- Removal of Sediment or Debris from a Floodplain
- Wetland Restoration Creation or Enhancement
- Scour Repairs at Structures; *(Must acquire DEEP Fisheries Concurrence to be eligible)*
- Guide Rail Installation
- Deck and Superstructure Replacements
- Minor Bridge Repairs and Access
- Fisheries Enhancements
- Surveying and Testing
- Bicycle / Pedestrian, Multi Use Trails and Enhancement Projects

The following required documentation is attached in support of this certification:

- Project description
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- Design plans, (dated 09/27/2019) with FEMA floodplain and floodway boundaries plotted, cross sections and profiles, as necessary, that clearly depict the floodplain involvement
- FEMA 100-year flood elevation plotted on elevation view (for structures)

Print Name: Tracey Brais

Title: Project Manager

Signature:

Date: 09/30/2019

Concurrence (to be completed by Hydraulics and Drainage)

Based on the documentation submitted, I hereby concur that the project qualifies for Flood Management General Certification.

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:

Date:

Flood Management General Certification

State Project No. 096-201 in Newtown and Southbury
Bridge No. 01218: I-84 Eastbound over Housatonic River
Bridge No. 04180: I-84 Westbound over Housatonic River

Existing Conditions

Bridge No. 01218 carries Interstate-84 (I-84) eastbound (EB) traffic, and Bridge No. 04180 carries I-84 westbound (WB) traffic over the Housatonic River between the Towns of Southbury and Newtown. Despite I-84 being logged as an east-west road, both bridges are oriented north-south at the bridge site and the river flows from west to east under both bridges. Bridge No. 01218 is a 4-span continuous plate girder structure. This structure, also known as the Rochambeau Bridge, was originally built in 1953 for the relocation of US Route 6 and reconstructed in 1979 as part of the building of I-84. The bridge carries two lanes of eastbound traffic and a sidewalk outboard of the south parapet. The total structure length is approximately 792 feet. The out-to-out width is 70.09 feet, with a 60-foot curb-to-curb roadway width, a 5-foot exterior sidewalk, and a 1.25-foot rail base for protective pedestrian fence. The 60-foot curb-to-curb width includes two travel lanes and two wide shoulders. The recent biennial state inspection revealed that Bridge No. 01218 superstructure is rated poor (4) due to primarily section losses noted of the floorbeams. Bridge No. 04180 is a 4-span girder steel bridge. Originally built in 1977 as part of the construction of I-84, the superstructure is supported by reinforced concrete abutments and piers found on piles. The overall length of the structure is 792 feet with an out-to-out of 63.8 feet and curb to curb width of 60 feet. The 60-foot curb-to-curb width includes two travel lanes and two wide shoulders. The recent biennial state inspection revealed that Bridge No. 04180 superstructure is rated fair (5) due to section losses, cracked fillet welds, and warped webs of select floorbeams.

The Housatonic River flows approximately west to east beneath the structures. Approximately 600 feet west of the project bridges, the Pomperaug River flows into the Housatonic River. Upstream of the project bridges, approximately 2.5 miles west of the project bridges, is the hydroelectric Shepaug Dam. Downstream from the project bridges, approximately 5.5 miles southeast of the project bridges, is the Stevenson Dam. This impoundment of the Housatonic River creates Lake Zoar. As a result of the floodway control, the bridges are considered hydraulically adequate. According to the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map number 09009C0228H and 09001C0180F (effective dates December 17, 2010 and June 18, 2010 respectively), the area of the crossing is located in Zone AE, a Special Hazard Area. The FEMA 100-year base flood elevation upstream and downstream of the crossings is 108 feet (NAVD88).

Proposed Project Description

The proposed work is intended to repair the existing bridge structures. Bridge Nos. 01218 and 04180 superstructures will be replaced. Each new superstructure will be a four span continuous constant depth welded weathering steel plate girder bridge with composite concrete deck. The approved rehabilitation scope includes the following items:

- The new superstructure of each bridge will support a roadway geometry to match existing including a 60 foot roadway curb-to-curb width.
- The superstructures will be designed to support 14 foot high noise walls which would be attached to the concrete parapets along each side of the roadway.
- Existing piers will be modified by the addition of a pier cap that extends beyond the existing pier stem to support the proposed fascia girders.

- Existing abutments will be modified to support the proposed girder configuration. Approach slabs will be included at each abutment.
- Repairs to areas of deteriorated concrete on all existing substructure units which are to remain.
- Installation of new bearings at all locations and finger type deck joints at the abutments.
- Construction of a drainage structure, which has an access door and connects to the storm drainage system, behind both abutment backwalls at each bridge.
- The vertical profile will be maintained as close a practical to the existing profile. The approach roadway work will be limited to paving and approach guide rail tie-in.
- Bridge No. 01218 will support a 5 foot wide clear sidewalk which connects to existing sidewalks in the approaches. A pedestrian fence will be installed along the east fascia adjacent to the sidewalk. Light standard anchorage build outs will be constructed as part of the parapet and located at the same locations as on the existing bridge. Conduit and junction boxes will be installed so that future illumination on the bridge is possible.
- Pier 3 of Bridge No. 04180 will have cofferdams installed around it for the construction of a concrete collar.
- Removal of debris that is collecting around the piers.
- The existing navigation system components attached to the bridges will be removed during construction, then reused and reinstalled. Conduit will be replaced in-kind and the navigation system will be reinstalled with a similar configuration as the existing.

The project also includes drainage modifications. Roadway drainage runoff on the bridges will continue to directly discharge into the Housatonic River through new scuppers in the bridge deck. A water quality swale in the median on the south side of the river is proposed to treat the stormwater collected from the south approach roadways prior to discharging to a proposed outfall located along the southern embankment. Stormwater collected on the northern approaches to the bridges will discharge to a new outfall located within the existing grassed median. The median will be modified to function as a water quality basin. Subsequently the stormwater flow will discharge to an existing outfall along the northeastern slope of I-84.

Construction is anticipated to commence in early 2020 and conclude in fall 2023. Construction access will occur from barges and a temporary work trestle located between I-84 EB and WB. A portion of Span 2 will remain open for recreational boat traffic during construction and will have a minimum width of 75 feet. Short closures to the recreational waterway will occur during large crane picks and barge movement. The proposed pier collar construction is anticipated to take place over the course of 8 weeks during the 4 year construction timeframe. A conceptual work trestle layout is included in the attached plans. The work trestle will be constructed in the median between the project bridges and is anticipated to remain for most of the construction duration (3-4 years). The maximum 70-foot wide temporary work trestle will be pile supported with an approximate pile spacing of 18 to 20 feet. The work trestle low chord elevation will be above the First Light project boundary elevation of 107.3 feet and above the 100-year floodplain elevation of 108 feet (NAVD88) with a minimum low chord elevation of approximately 109.5 feet. The contractor shall make a best effort to remove all piles before the completion of construction; however, if some piles cannot be removed, they will be cut a minimum 2 feet below mudline.

To access the work trestle, haul roads are proposed to be constructed within the bridge approach medians for transport of materials and equipment from I-84 to the work trestle. The haul roads are to be constructed so that they do not encroach on any wetlands, the 100-year floodplain elevation, and/or the Housatonic River. A temporary earth retaining system will be installed and best management practices will be used to

prevent haul road materials and excavation from falling into the regulated areas. Barges are proposed to facilitate superstructure demolition and erection operations and will be launched from the proposed work trestle. When not in use, the barges will be moored in Spans 1 or 3 using spuds or by tying off to the work trestle.

Project Qualification for General Certification

The proposed repairs are included in Category 8: Deck and Superstructure Replacement. According to the FEMA mapping, the project bridges and surrounding area are within the FEMA 100-year floodplain at elevation 108. The proposed work shall include a containment system/debris shield that will be installed at approximately the same elevation as the existing girder bottom flanges (estimated EL.127 NAVD88) to ensure that no materials fall from the bridge into the regulated areas during the superstructure replacement operations. The proposed low chord elevations are approximately 3 feet higher than the existing bridge low chord elevations; however both the existing and proposed low chord elevations are above the 100-year floodplain elevation. No decrease in the hydraulic capacity of the bridges is proposed; the project is limited to the aforementioned maintenance and repair tasks on the existing structures. The temporary work trestle will be set well above the FEMA 100-year flood. The only impact to the channel as a result of the trestle are the piles. A reasonable assumption was made that, given the relative size of the channel, proposed cofferdam, and trestle piles, the pile and cofferdam configuration will have no measurable impact to the channel capacity. Therefore, a detailed hydraulic analysis of the work trestle and cofferdam was not necessary. The proposed project will not obstruct flood flows or result in an adverse increase in flood elevations. The majority of the work (superstructure demolition and replacement, pier cap construction, abutment modifications) will be performed above the floodplain boundary. Extensive excavation will be required to construct the haul roads located within the median; however, the excavation work and temporary haul road will be above the 100-year floodplain.

Additional work within the floodplain includes the excavation required for the construction of the Pier 3 concrete collar of Bridge No. 04180. Once the collar has been constructed, the excavated area will be backfilled with new natural streambed material installed to match the existing mudline elevation. This excavation and fill at Bridge 04180 Pier 3 will have a net quantity of 0 cubic yards. The concrete pier collar will add a negligible amount of fill when taking into account the hydraulic area of the bridge.

The project will meet the following conditions required of FM-General approvals:

- Sedimentation and erosion controls included in the design are in accordance with the *2002 Connecticut Guidelines for Soil Erosion and Sedimentation Control* and current CTDOT standards. Proper erosion and sedimentation controls will be utilized in conjunction with Best Management Practices as outlined in Section 1.10 of The State of Connecticut Department of Transportation Standard Specifications for Roads, Bridge and Incidental Construction, Form 817, as revised by the latest supplementals.
- Temporary structures such as the work trestle and cofferdam around Bridge No. 04180 Pier 3 are to be designed in accordance with the guidelines outlined in the *CTDOT Drainage Manual for Temporary Hydraulic Structures*. The temporary work trestle platforms will be set well above the FEMA 100-year flood. The only impacts to the channel are the placement of piles and a cofferdam surrounding Bridge 04180 Pier 3. A reasonable assumption was made that, given the relative size of the piles and cofferdam to the channel in a lake setting (Lake Zoar), the temporary work configuration will have no measurable impact to the channel capacity. Therefore, it is not necessary to perform a hydraulic analysis.

Any other temporary facilities or equipment requiring work in or placement within a floodplain will be removed in a timely manner from the site in case of a flood warning.

- Temporary facilities will allow for the continued passage of fish. DEEP Fisheries did not have any concerns with this project. Per correspondence with DEEP Fisheries, no time of year restriction for unconfined in-water work is specified.
- Modifications to I-84 drainage system will be designed in accordance with the 2004 Connecticut Stormwater Quality Manual to provide stormwater treatment.

Attachments

- Attachment A: Location Map
- Attachment B: FEMA Flood Insurance Rate Maps
- Attachment C: Fisheries Coordination
- Attachment D: Permit Plans

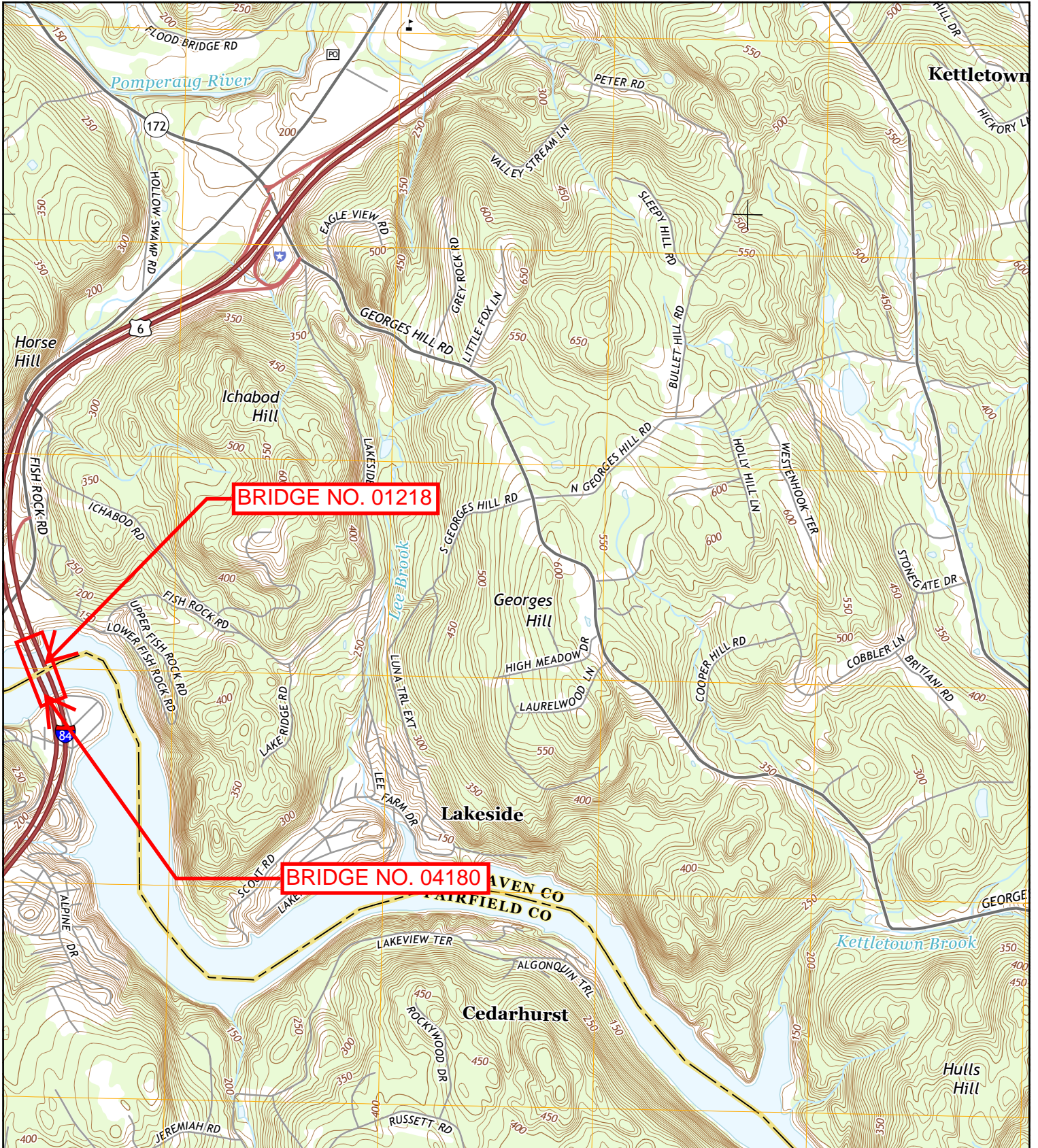
Attachment A: Location Map



Engineers
Designers
Consultants
Planners
Scientists
101 East River Drive, 1st Floor * East Hartford, CT 06108
T 860.290.4100 * www.cmeengineering.com

USGS QUADRANGLE MAP

BRIDGE NOS. 01218 & 04180 NEWTOWN/SOUTHBURY
I-84 EASTBOUND AND WESTBOUND OVER HOUSATONIC RIVER



USGS QUAD
SOUTHBURY,
CONNECTICUT

REQUESTER: CONNDOT
DATE: 2015

1 INCH = 2,000 FEET

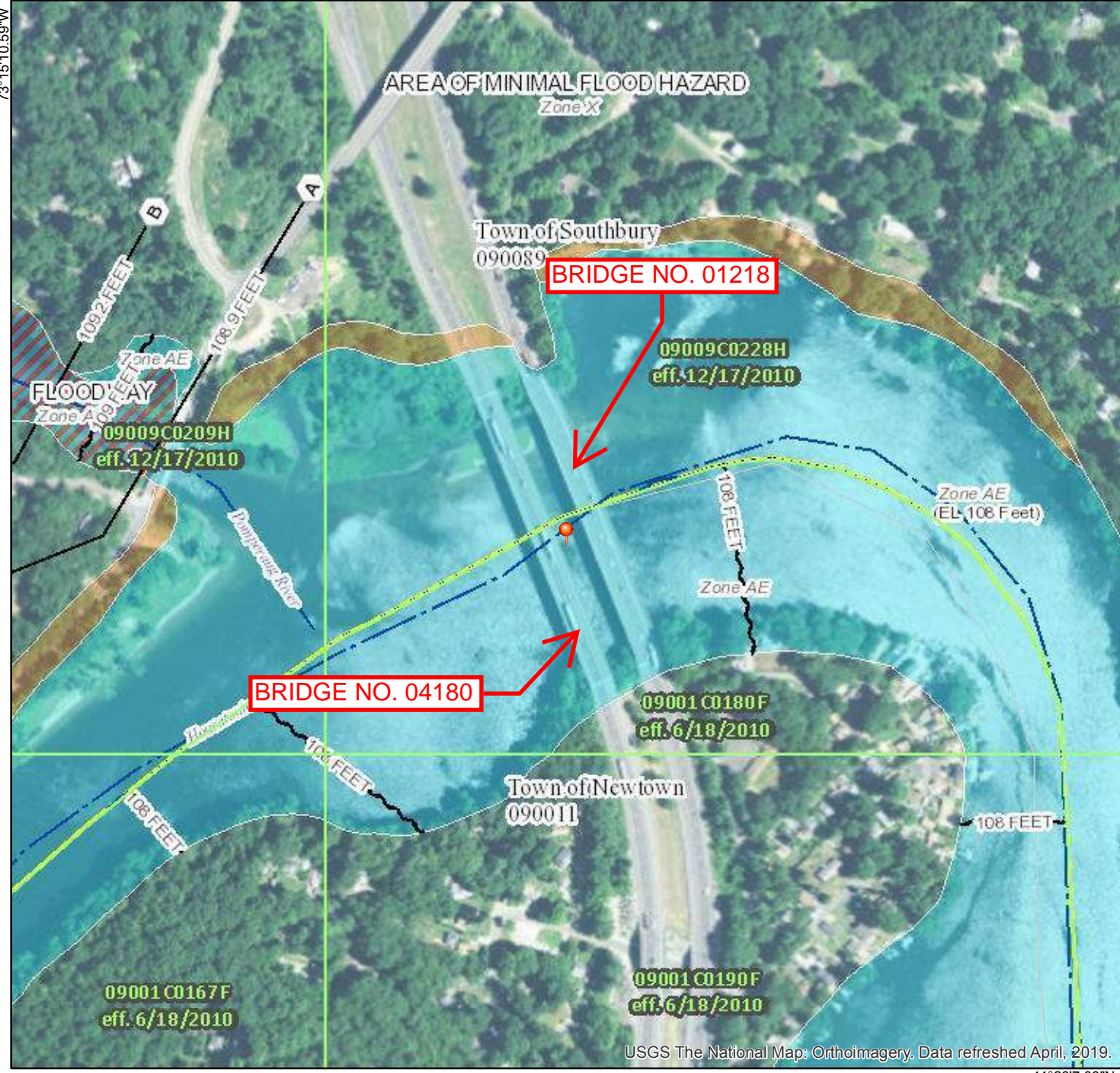


Attachment B: FEMA Flood Insurance Rate Maps

National Flood Hazard Layer FIRMette



41°26'34.03"N



USGS The National Map: Orthoimagery. Data refreshed April, 2019. 1:6,000 Feet

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- | | | |
|------------------------------------|--|---|
| SPECIAL FLOOD HAZARD AREAS | | Without Base Flood Elevation (BFE)
Zone A, V, A99 |
| | | With BFE or Depth Zone AE, AO, AH, VE, AR |
| | | Regulatory Floodway |
| OTHER AREAS OF FLOOD HAZARD | | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X |
| | | Future Conditions 1% Annual Chance Flood Hazard Zone X |
| | | Area with Reduced Flood Risk due to Levee. See Notes. Zone X |
| | | Area with Flood Risk due to Levee Zone D |
| OTHER AREAS | | NO SCREEN Area of Minimal Flood Hazard Zone X |
| | | Effective LOMRs |
| | | Area of Undetermined Flood Hazard Zone D |
| GENERAL STRUCTURES | | Channel, Culvert, or Storm Sewer |
| | | Levee, Dike, or Floodwall |
| OTHER FEATURES | | 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation |
| | | 17.5 Coastal Transect |
| | | Base Flood Elevation Line (BFE) |
| | | Limit of Study |
| | | Jurisdiction Boundary |
| | | Coastal Transect Baseline |
| | | Profile Baseline |
| | | Hydrographic Feature |
| MAP PANELS | | Digital Data Available |
| | | No Digital Data Available |
| | | Unmapped |



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/19/2019 at 9:25:40 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

73°14'33.13"W

41°26'7.06"N

Attachment C: Fisheries Coordination

Salter, Michael J

From: Roise, Michelle A.
Sent: Tuesday, February 14, 2017 2:57 PM
To: Salter, Michael J; Finch, Alexander T
Subject: FW: initial fisheries reviews for DOT (Don projects) February 2017

From: Mysling, Donald
Sent: Tuesday, February 14, 2017 1:48 PM
To: Roise, Michelle A.
Subject: RE: initial fisheries reviews for DOT (Don projects) February 2017

Michelle,

As previously discussed, there are no fisheries resource issues of concern with either Project 96-200 or Project 96-201.

Best regards,

Don

Don Mysling, Senior Fisheries Biologist
CT DEEP Fisheries Division
Habitat Conservation & Enhancement Program
Western Headquarters, 230 Plymouth Road, Harwinton, CT 06791
(P) 860.567.8998 (E-mail) donald.mysling@ct.gov

From: Roise, Michelle A.
Sent: Tuesday, February 14, 2017 1:19 PM
To: Mysling, Donald <Donald.Mysling@ct.gov>
Cc: Salter, Michael J <Michael.Salter@ct.gov>; Finch, Alexander T <Alexander.Finch@ct.gov>; Harms, David W <David.Harms@ct.gov>
Subject: FW: initial fisheries reviews for DOT (Don projects) February 2017

Good afternoon Don,

You gave me a call last week in response to my email below. When we spoke, you mentioned that for Project 96-200 (4 culvert re-linings) and Project 96-201 (I-84 EB/WB bridge rehab) there was no concern with resources for those projects. Were you able to review and confirm that finding and/or send an email with the finding? I've attached the project's information in case you need it.

(P.S. I am still waiting for plan sheets for project 109-165, Tomlinson Ave o/Quinnipiac River)
Hopefully you received the other information I emailed.
Let me know if you have any questions or need me to print anything out for Thursday.

Thank you!
See you then,

Michelle Roise
CTDOT
EPC
860-594-3223

From: Roise, Michelle A.
Sent: Friday, February 03, 2017 3:42 PM
To: Mysling, Donald
Cc: Harms, David W; Alexander, Mark W; Carlino, Mark F.; Gilmore, Robert; Gephard, Steve; DOT-EPC; Davis, Andrew H; Ferraro, Aaron M; Finch, Alexander T; Gould, Marilyn R.; Salter, Michael J; Samorajczyk, Christopher W; Saul, Amanda M
Subject: initial fisheries reviews for DOT (Don projects) February 2017

Hi Don,

Here is the monthly DOT fisheries status update ☺ The table below lists DOT projects that are “over 3 months” pending an initial fisheries review.

Also attached is the location map that prioritizes all the initial reviews. The attached spreadsheet lists all the projects I am aware of in your area. I sorted the attached file to list the pending DEEP items at the top. The entire fisheries spreadsheet, as well as the Interagency meeting minutes, have been placed on projectwise for DEEP access.

I hope this information is helpful. If you have any questions, or need additional information, feel free to contact me. In particular, if any of these projects have a concern in which presenting and discussing at the Interagency meeting would be beneficial, let me know. The next Interagency meeting is scheduled for February 16.

**FISHERIES INITIAL REVIEW OVER 3 MONTHS WAITING FOR RESPONSE
as of February 2, 2017**

Project	To DEEP	FDP	Assigned	Biologist
83-266 Wepawaug Rv, Milford	5.13.15/11.29.16	5.9.18	Amanda	Don
96-200 4 culvert relinings, Newtown	9.30.16	5.30.18	Alex	Don
96-201 I-84 EB/WB , Newtown	9.26.16	7.10.19	Mike	Don
99-129 Whiting Rv, No. Canaan	5.13.15	1.17.18	Amanda	Don
109-165 Quinnipiac, Plainville	*	12.19.18	Chris	Don
135-331 Rippowan River, Stamford	7.18.16	6.13.18	Mike	Don
168-160 Sprain Br, Woodbury	3.30.16	8.22.18	Chris	Don

* 109-165 - needs field review with Don to ensure fisheries requests are all included in project (pending plans from designer to review plans prior to site visit)

Thank You!

Michelle Roise
Environmental Permit Coordination Unit (EPC)
Connecticut Department of Transportation
(860) 594-3223

TO: Michael Salter, DOT Office of Environmental Planning

FROM: Bruce Williams, DEEP Fisheries Division

DATE: December 10, 2018

SUBJECT: Final Review: I-84 Bridge Rehabilitation, Lake Zoar

Type of Permit:

1. **DOT Culvert/Bridge Projects**

Project#: 96-201

2. **Diversion**

3. **PGP/Inland Wetland**

4. **Water Quality Certification**

Bridge#: 01218/04180

Applicant: Connecticut Department of Transportation

State P.E. Project#:

Town: Newtown/Southbury

Waters: Housatonic River/Lake Zoar

Sub Regional Basin #: 6000

Project Scope: Proposed rehabilitation of Bridge# 01218, which carries I-84 eastbound over Housatonic River at Lake Zoar, and Bridge# 04180, which carries the westbound traffic. The scope of the rehabilitation includes the following items:

- Replacement of the existing superstructures with new steel multi-girder superstructures
- Construction of longer pier caps to accommodate the new girder configurations
- Construction of a new concrete collar on the pile cap for pier #3 of Bridge# 04180
- Placement of standard riprap to the edge of the river on the eastern half of the embankment at the south abutment of Bridge# 01218

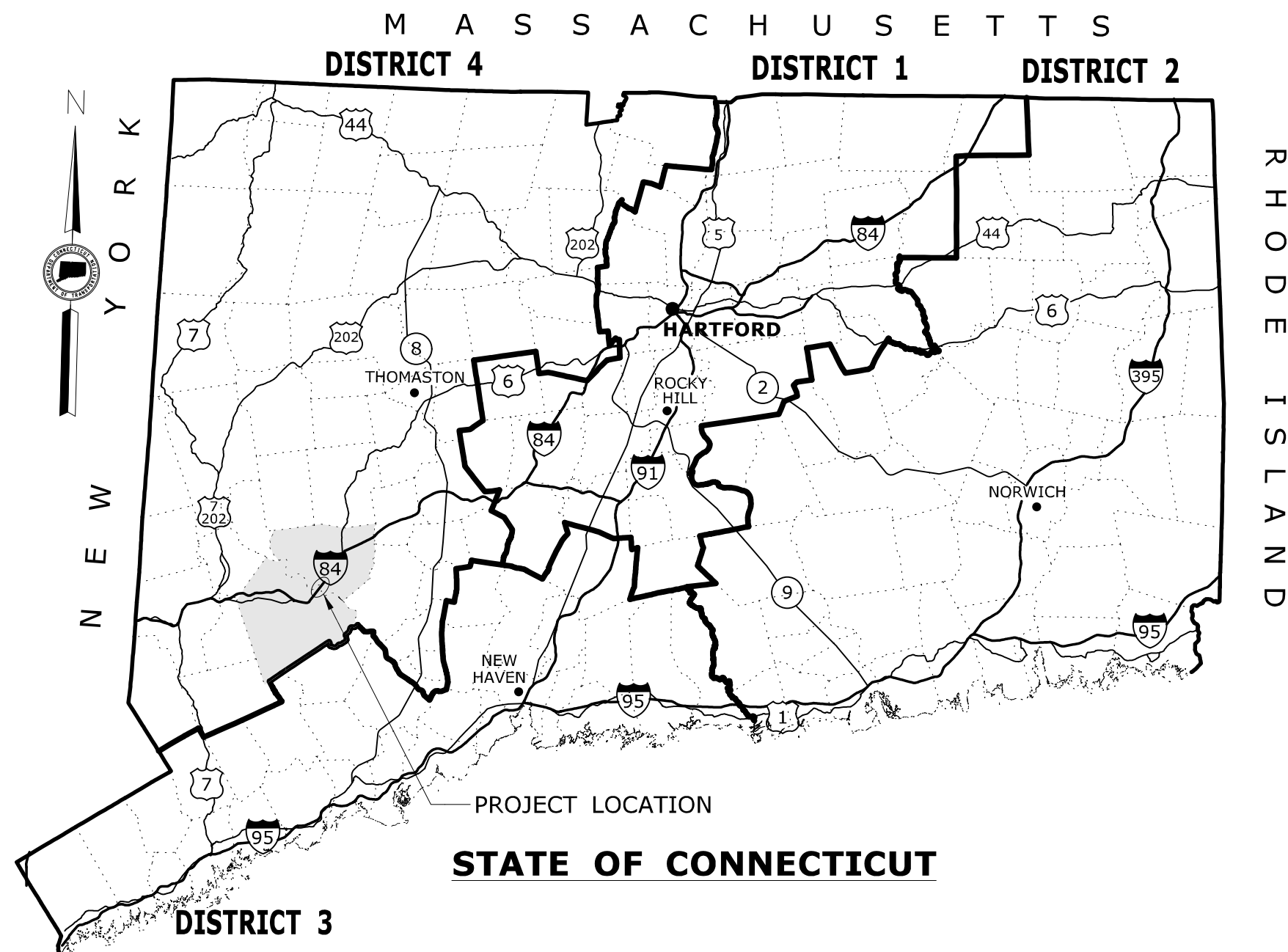
Fisheries Resources: Lake Zoar supports a large recreational fishery. Important fish species found in the lake include Black Crappie, Largemouth Bass, Smallmouth Bass, Sunfish, White Perch, White Catfish, Walleye, and Yellow Perch.

Comments: The proposed project is expected to have little impact on aquatic resources, but recreational boaters and anglers heavily use the navigational channel under bridges. If the channel under the bridge or the state boat launch is closed to boating, prior notification will need to be given to the DEEP Fisheries Division, DEEP Boating Division, and the Lake Zoar Authority. Prior notification should also be posted at the state boat launch in Southbury. Any closure should be limited in duration and exclude weekends, especially during the summer months.

CC. Steve Gephard

Attachment D: Permit Plans

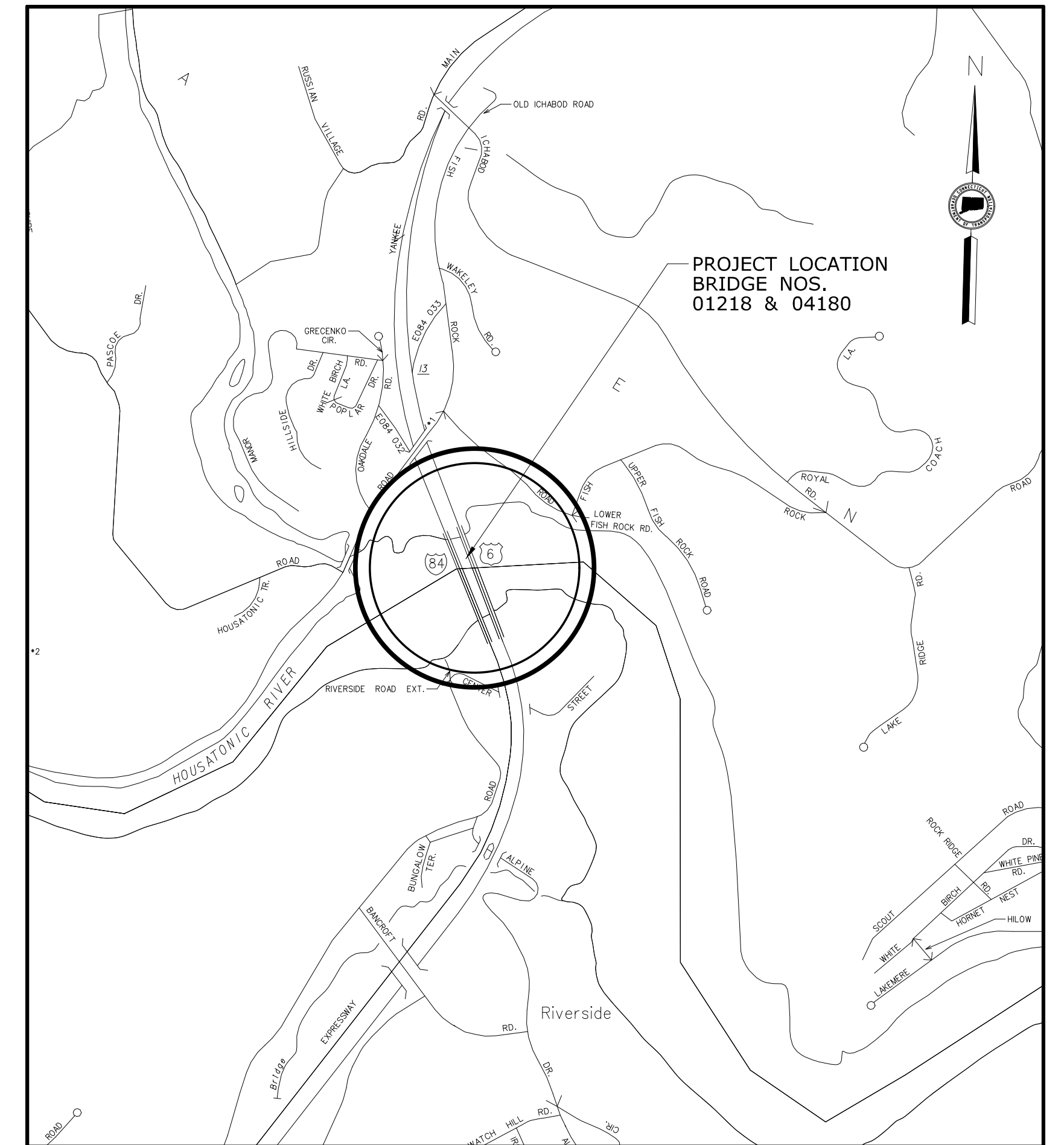
ENVIRONMENTAL PERMIT PLANS STATE PROJECT NO. 0096-0201 REHABILITATION OF BRIDGE NOS. 01218 AND 04180 IN THE TOWNS OF NEWTOWN AND SOUTHBURY



GENERAL NOTES:

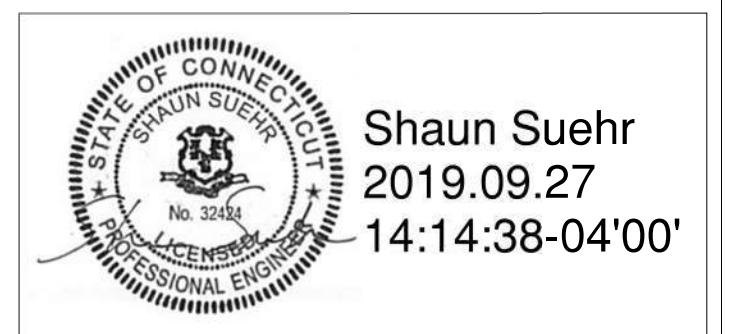
1. THESE PLANS ARE INTENDED ONLY FOR ENVIRONMENTAL PERMITTING PURPOSES. THESE PLANS HOLD AUTHORITY FOR ALL ACTIVITIES CONCERNING THE REGULATED AREA. FOR DETAILED PLANIMETRIC INFORMATION AND PAYMENT REFER TO THE APPLICABLE CONTRACT DOCUMENTS.
2. THE DEPARTMENT OF TRANSPORTATION WILL ONLY SUBMIT REVISIONS 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 NAD 1927 VERTICAL DATUM BASED ON NAVD 1988.
5. ALL CONSTRUCTION ACTIVITIES WILL BE CONDUCTED IN ACCORDANCE WITH THE DEPARTMENT'S STANDARD SPECIFICATIONS FOR ROADS, BRIDGE AND INCIDENTAL CONSTRUCTION, FORM 817, SECTION 1.10 AND WILL ALSO FOLLOW REQUIRED BEST MANAGEMENT PRACTICES (BMPs) AND SEDIMENT AND EROSION CONTROL MEASURES IN ACCORDANCE WITH THE 2002 EROSION & SEDIMENTATION CONTROL GUIDELINES AND THE 2004 STORMWATER QUALITY MANUAL.

DRAWING NUMBER	DRAWING TITLE
PMT-01	INDEX OF DRAWINGS
PMT-02	GENERAL SITE PLAN
PMT-03	GENERAL SITE PLAN BRIDGE NO. 04180 AND 01218
PMT-04	WETLAND / WATERCOURSE IMPACT PLAN
PMT-05	100 YEAR FLOOD IMPACT PLAN
PMT-06	I-84 WB PIER 3 CUT / FILL LIMITS
PMT-07	CONSTRUCTION STAGING - 1
PMT-08	CONSTRUCTION STAGING - 2
PMT-09	CONSTRUCTION STAGING - 3
PMT-10	CONSTRUCTION STAGING - 4 AND 5
PMT-11	TEMPORARY TRESTLE DETAILS 1
PMT-12	TEMPORARY TRESTLE DETAILS 2
PMT-13	TEMPORARY NAVIGATION LIGHTING / BOAT SAFETY PLAN





LOCATION PLAN
1"=300'

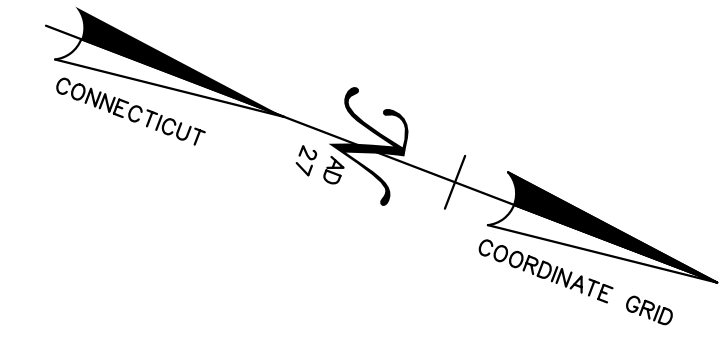
DESIGNED BY:
LOUIS BERGER US
A WSP COMPANY
55 CAPITAL BOULEVARD
ROCKY HILL, CT 06067



Shaun Suehr
2019.09.27
14:14:38-04'00"

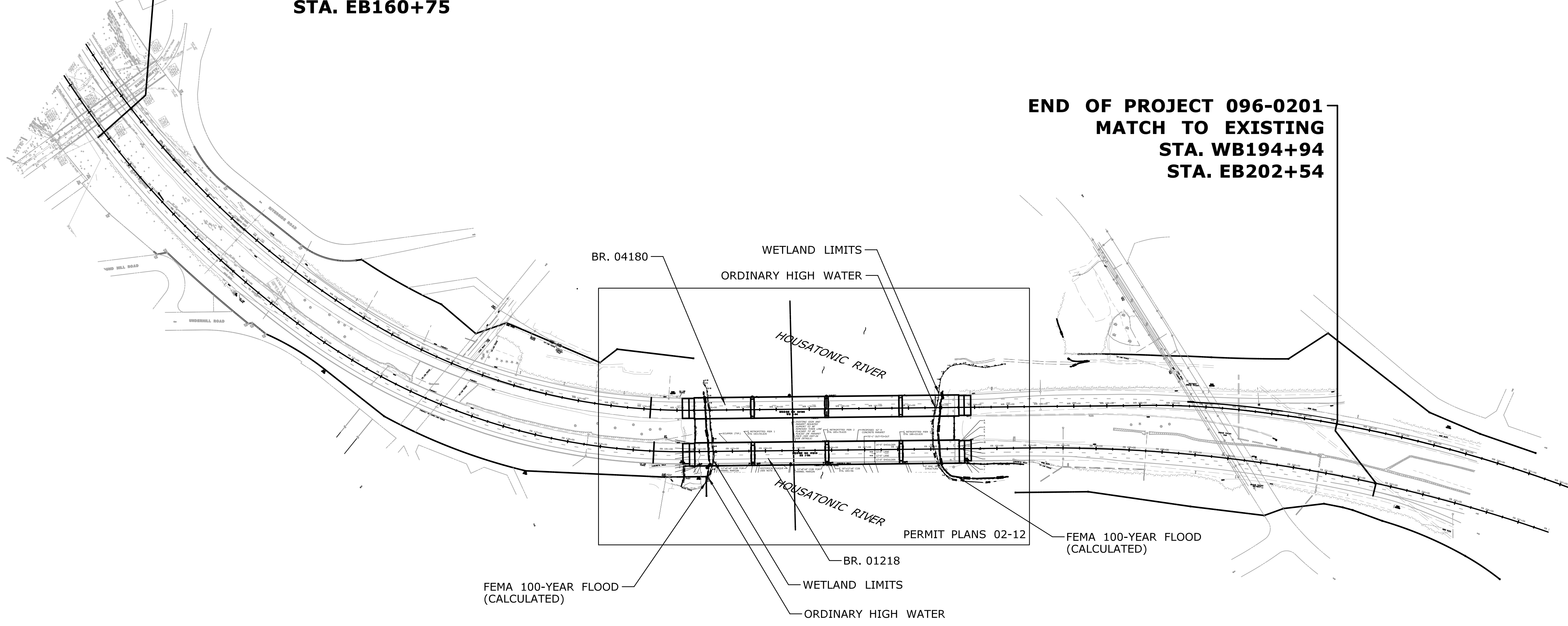
ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 9/24/2019

<table border="1" style="width: 100%;"> <thead> <tr> <th>REV.</th> <th>DATE</th> <th>REVISION DESCRIPTION</th> <th>SHEET NO.</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REV.	DATE	REVISION DESCRIPTION	SHEET NO.					<p>THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.</p>	<p>DESIGNER/DRAFTER: AJM</p> <p>CHECKED BY: JPM</p> <p>SCALE AS NOTED</p>	 <p>STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION</p>	<p>SIGNATURE/ BLOCK:</p>  <p>LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067</p>	<p>PROJECT TITLE:</p> <p style="text-align: center;">REHABILITATION OF BRIDGE NOS. 01218 AND 04180 I-84 OVER HOUSATONIC RIVER</p>	<p>TOWN: NEWTOWN/SOUTHBURY</p> <p>DRAWING TITLE: INDEX OF DRAWINGS</p>	<p>PROJECT NO. 0096-0201</p> <p>DRAWING NO. PMT-01</p> <p>SHEET NO.</p>
REV.	DATE	REVISION DESCRIPTION	SHEET NO.												
Plotted Date: 9/24/2019				Filename: ...VHW_MSH_0096_0201_TSH.dgn											



**BEGIN PROJECT 096-0201
MATCH TO EXISTING
STA. WB155+85
STA. EB160+75**

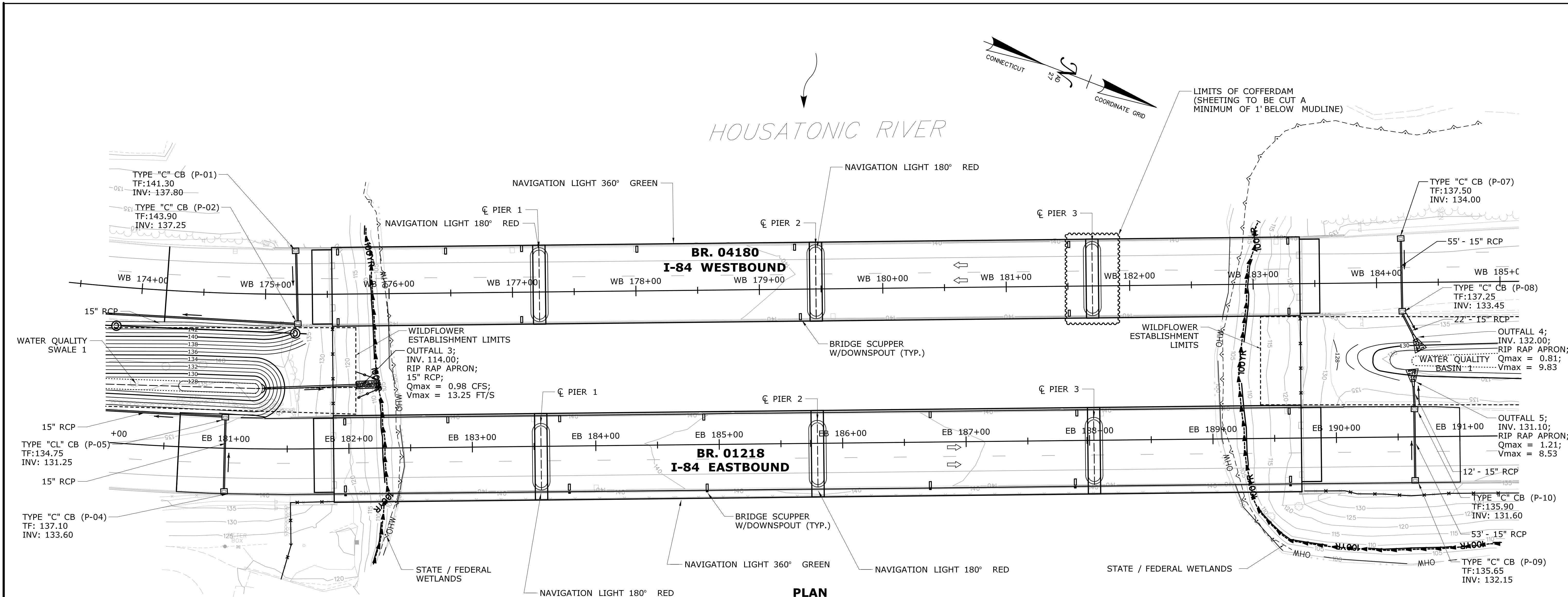
**END OF PROJECT 096-0201
MATCH TO EXISTING
STA. WB194+94
STA. EB202+54**



- LEGEND:**
- FEMA 100-YEAR FLOOD (CALCULATED)
 - ORDINARY HIGH WATER
 - STATE/FEDERAL WETLANDS

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 9/24/2019

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.		DESIGNER/DRAFTER: AJM CHECKED BY: JPM SCALE IN FEET 0 200 400 SCALE 1"=200'	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION Filename: ...\\SB_MSTL_0096_0201_PMT-02.dgn	SIGNATURE/BLOCK: LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067	PROJECT TITLE: REHABILITATION OF BRIDGE NOS 01218 & 04180- I-84 EB/WB OVER HOUSATONIC RIVER	TOWN: NEWTOWN/SOUTHBURY	PROJECT NO. 96-201
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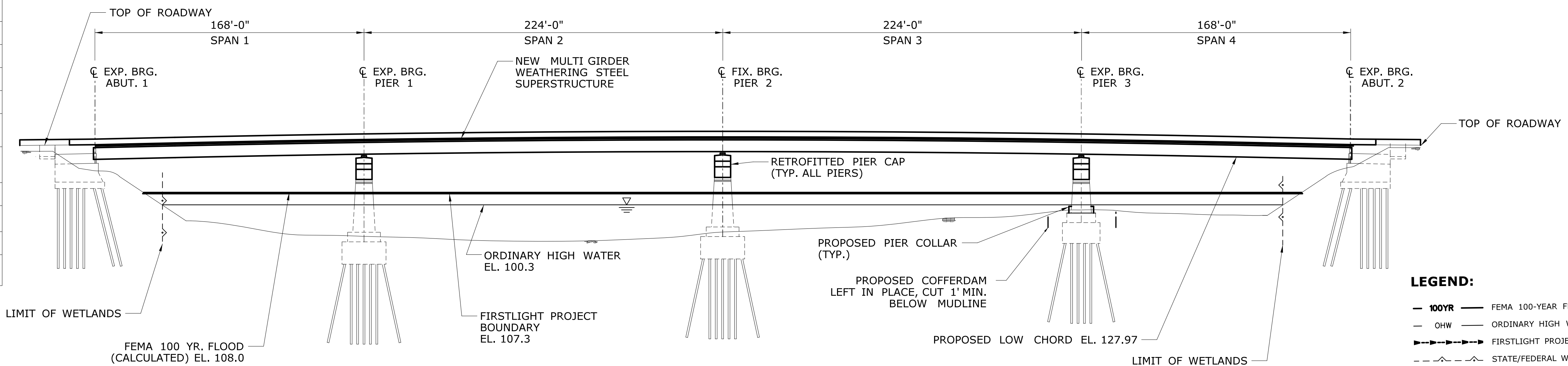


PLAN

SCALE: 1" = 40'

HYDRAULIC DATA	
DRAINAGE AREA (SQ MI)	1,510
DESIGN FREQUENCY (YRS)	100
DESIGN DISCHARGE (CFS)	126,000
AVERAGE DAILY FLOW ELEV (FT)	100
UPSTREAM DESIGN WATER SURFACE ELEV (FT)	108
DOWNSTREAM DESIGN WATER SURFACE ELEV (FT)	108
MAXIMUM SCOUR ELEV (FT)	42
FREQUENCY (YR)	500
DISCHARGE (CFS)	196,000
WORST CASE SCOUR SUB-STRUCTURE UNIT	PIER 1

NOTE: ELEVATIONS PROVIDED ARE REFERENCED TO NAVD88 DATUM.
¹ FAIRFIELD COUNTY FLOOD INSURANCE STUDY, OCT. 16, 2013.
² NORMAL POOL ELEVATION (PROJ. NO. 96-1115 AS-BUILT PLANS)
³ ESTIMATED FROM LEVEL 1 SCOUR ANALYSIS REPORT, DATED SEPT. 21, 2018.



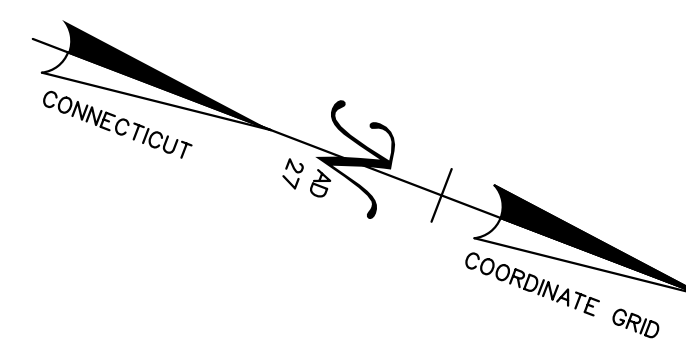
ELEVATION

SCALE: 1" = 40'

- LEGEND:**
- 100YR — FEMA 100-YEAR FLOOD (CALCULATED)
 - OHW — ORDINARY HIGH WATER
 - FIRSTLIGHT PROJECT BOUNDARY
 - STATE/FEDERAL WETLANDS
 - SEDIMENTATION CONTROL SYSTEM (SCS)

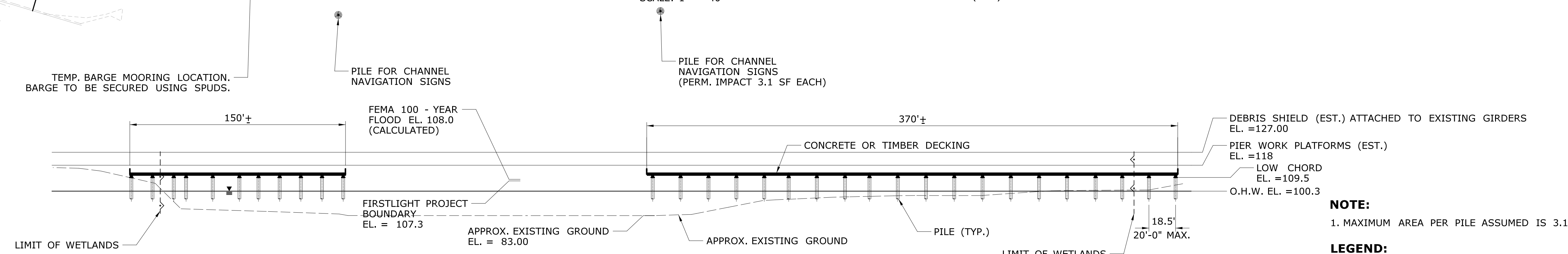
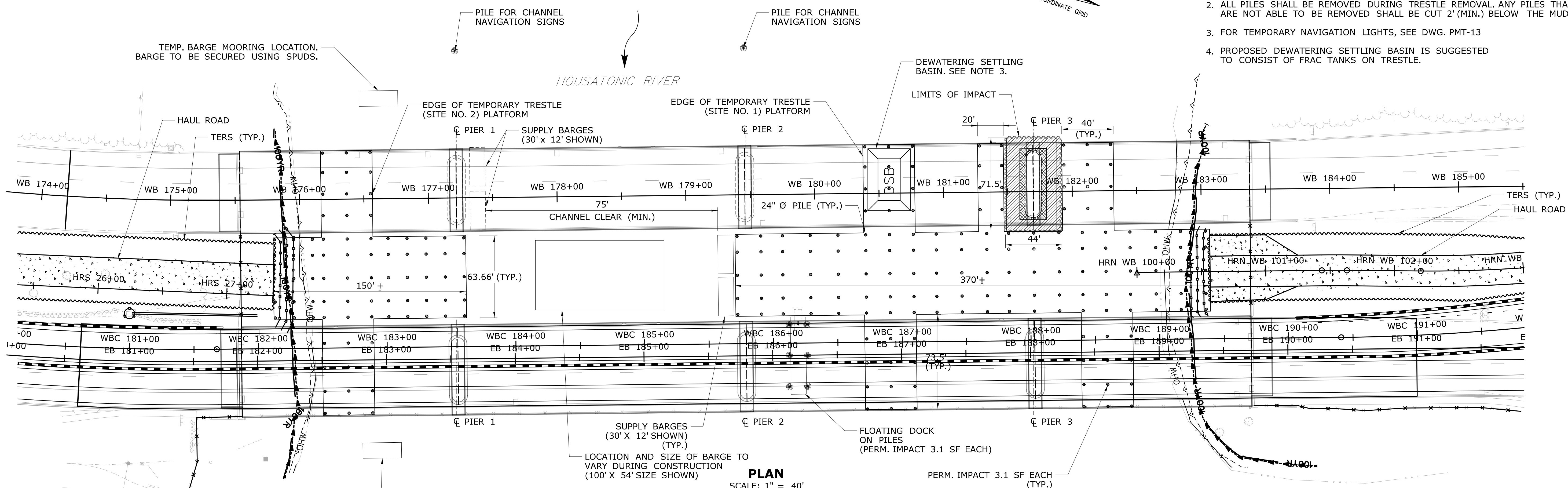
ENVIRONMENTAL PERMIT PLANS
 PLAN DATE: 9/24/2019

DESIGNER/DRAFTER: AJM	CHECKED BY: JPM				SIGNATURE/ BLOCK:	PROJECT TITLE: REHABILITATION OF BRIDGE NOS 01218 & 04180- I-84 EB/WB OVER HOUSATONIC RIVER	TOWN: NEWTOWN/SOUTHBURY
THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.		SCALE AS NOTED		LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067	PROJECT NO. 96-201 DRAWING NO. PMT-03 SHEET NO.		DRAWING TITLE: GENERAL SITE PLAN
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 9/24/2019	Filename: ...\\SB_MSTL_0096_0201_PMT-03.dgn		



NOTES:

1. THE CONTRACTOR SHALL NOT WORK WITHIN THE LIMITS OF THE WETLANDS AND WATERCOURSE WITH THE EXCEPTION OF THOSE AREAS DELINEATED AS TEMPORARY OR PERMANENT IMPACTS TO THE WETLANDS AND WATERCOURSE. ALL DISTURBED AREAS SHALL BE RESTORED TO PRECONSTRUCTION CONDITION.
2. ALL PILES SHALL BE REMOVED DURING TRESTLE REMOVAL. ANY PILES THAT ARE NOT ABLE TO BE REMOVED SHALL BE CUT 2' (MIN.) BELOW THE MUDLINE.
3. FOR TEMPORARY NAVIGATION LIGHTS, SEE DWG. PMT-13
4. PROPOSED DEWATERING SETTLING BASIN IS SUGGESTED TO CONSIST OF FRAC TANKS ON TRESTLE.



- NOTE:**
1. MAXIMUM AREA PER PILE ASSUMED IS 3.1 SF.
- LEGEND:**
- TEMPORARY IMPACT
 - PERMANENT IMPACT
 - 100YR - FEMA 100-YEAR FLOOD (CALCULATED)
 - OHW - ORDINARY HIGH WATER
 - FIRSTLIGHT PROJECT BOUNDARY
 - STATE/FEDERAL WETLANDS
 - SEDIMENTATION CONTROL SYSTEM (SCS)
 - TEMPORARY EARTH RETAINING SYSTEM (TERS)

WETLAND IMPACT TABLE			
	WETLAND IMPACTS SF (ACRES)	WATERWAY IMPACTS SF (ACRES)	TOTAL SF (ACRES)
PERMANENT IMPACTS	0 SF (0.00)	1800 SF (0.04)	1800 SF (0.04)
TEMPORARY IMPACTS	0 SF (0.00)	2000 SF (0.05)	2000 SF (0.05)
TOTAL IMPACTS	0 SF (0.00)	3800 SF (0.09)	3800 SF (0.09)

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 9/24/2019

TOWN: **NEWTOWN/SOUTHBURY** PROJECT NO. **96-201**

DRAWING TITLE: **WETLAND/WATERCOURSE IMPACT PLAN** DRAWING NO. **PMT-04**

SHEET NO.

DESIGNER/DRAFTER: AJM	
CHECKED BY: JPM	
SCALE AS NOTED	
Plotted Date: 9/27/2019	File name: ...SB_MSTL_0096_0201_PMT-04.dgn

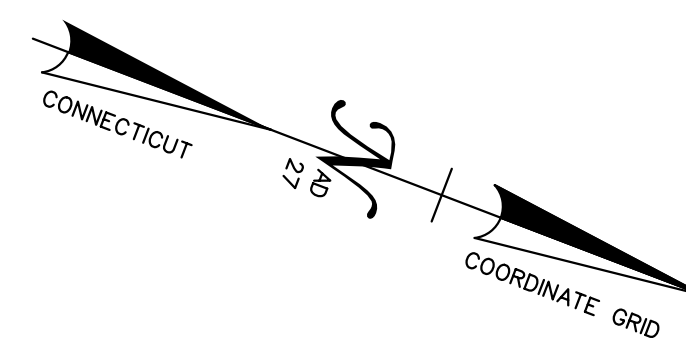
STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Signature/Block:

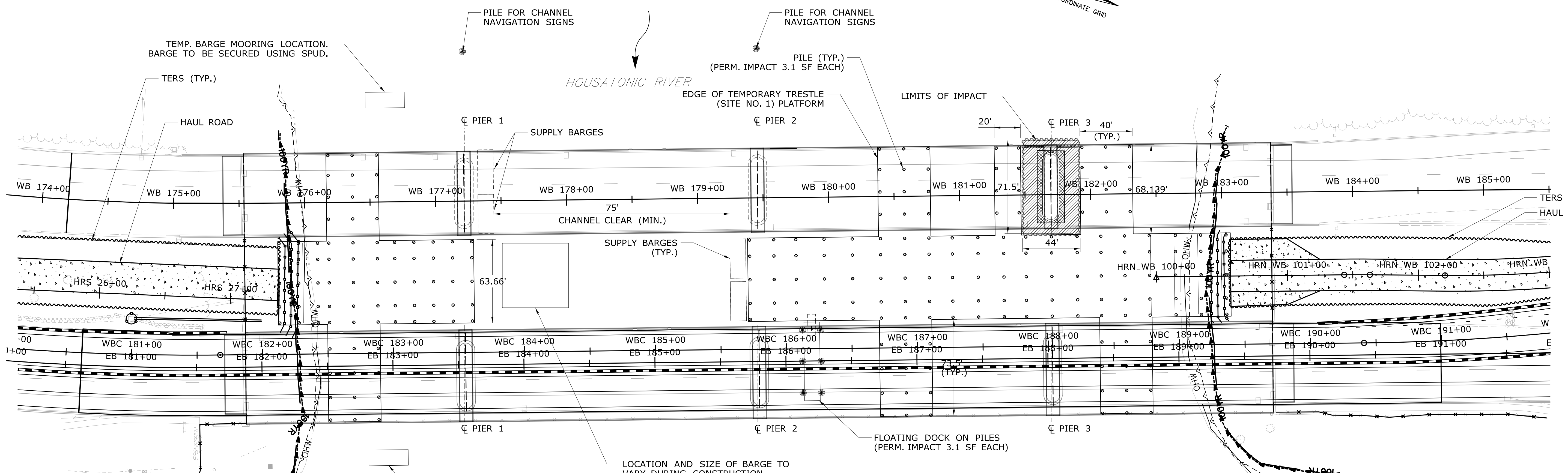
LOUIS BERGER US
A WSP COMPANY
55 CAPITAL BOULEVARD
ROCKY HILL, CT 06067

PROJECT TITLE:
**REHABILITATION OF BRIDGE NOS
01218 & 04180- I-84 EB/WB
OVER HOUSATONIC RIVER**

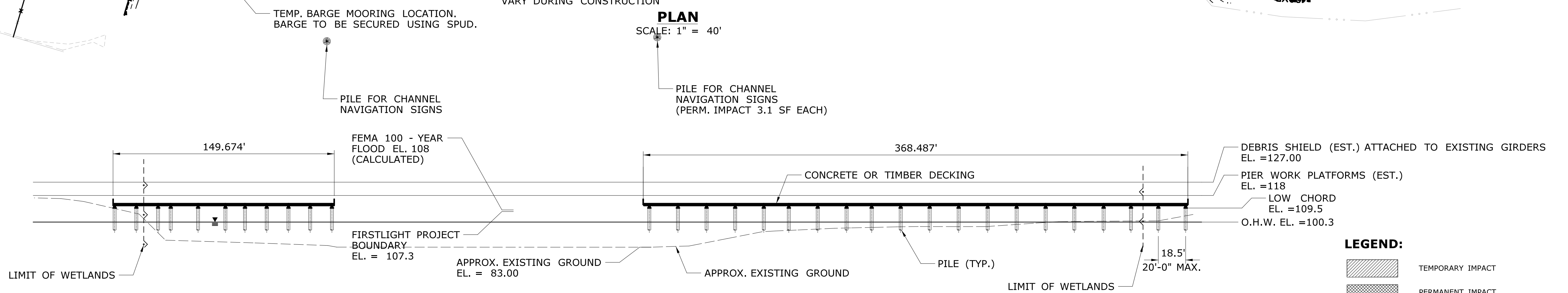
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NOTE:
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PLAN
 SCALE: 1" = 40'



ELEVATION
 SCALE: 1" = 40'

100 YEAR FLOODPLAIN IMPACT TABLE, CUT AND FILL INFORMATION	
VOLUME IMPACTS	
EXCAVATION IN FEMA FLOODPLAIN	FILL IN FEMA FLOODPLAIN
740 CY	830 CY

- LEGEND:**
- TEMPORARY IMPACT
 - PERMANENT IMPACT
 - 100YR - FEMA 100-YEAR FLOOD (CALCULATED)
 - OHW - ORDINARY HIGH WATER
 - FIRSTLIGHT PROJECT BOUNDARY
 - STATE/FEDERAL WETLANDS
 - SEDIMENTATION CONTROL SYSTEM (SCS)
 - TEMPORARY EARTH RETAINING SYSTEM (TERS)

ENVIRONMENTAL PERMIT PLANS
 PLAN DATE: 9/24/2019

	DESIGNER/DRAFTER: AJM CHECKED BY: JPM SCALE AS NOTED	<p>STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION</p>	SIGNATURE/BLOCK: <p>LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067</p>	PROJECT TITLE: <p>REHABILITATION OF BRIDGE NOS 01218 & 04180- I-84 EB/WB OVER HOUSATONIC RIVER</p>	TOWN: <p>NEWTOWN/SOUTHBURY</p>	PROJECT NO. <p>96-201</p>
						DRAWING NO. <p>PMT-05</p>
						SHEET NO. <p>100 YEAR FLOOD IMPACT PLAN</p>

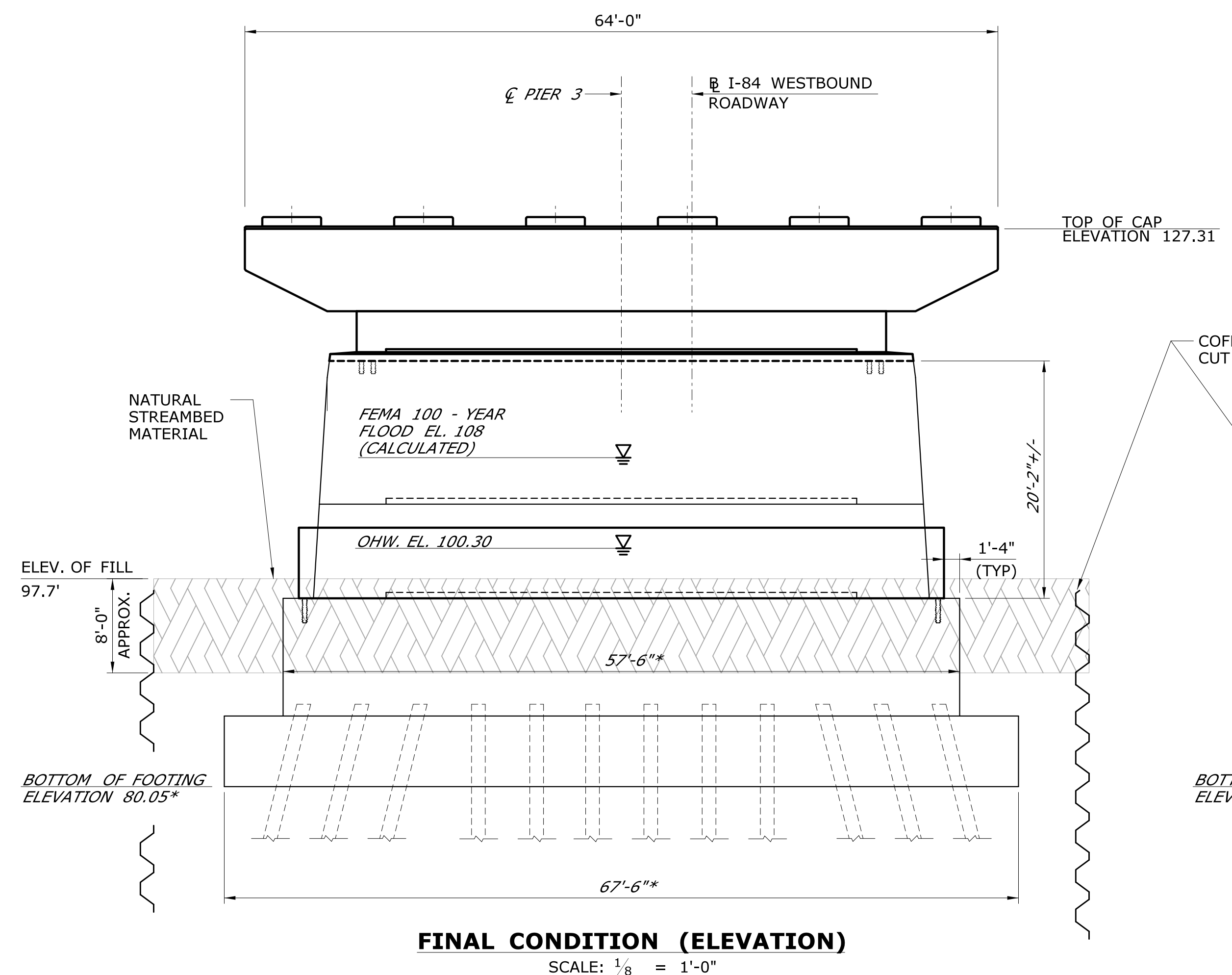
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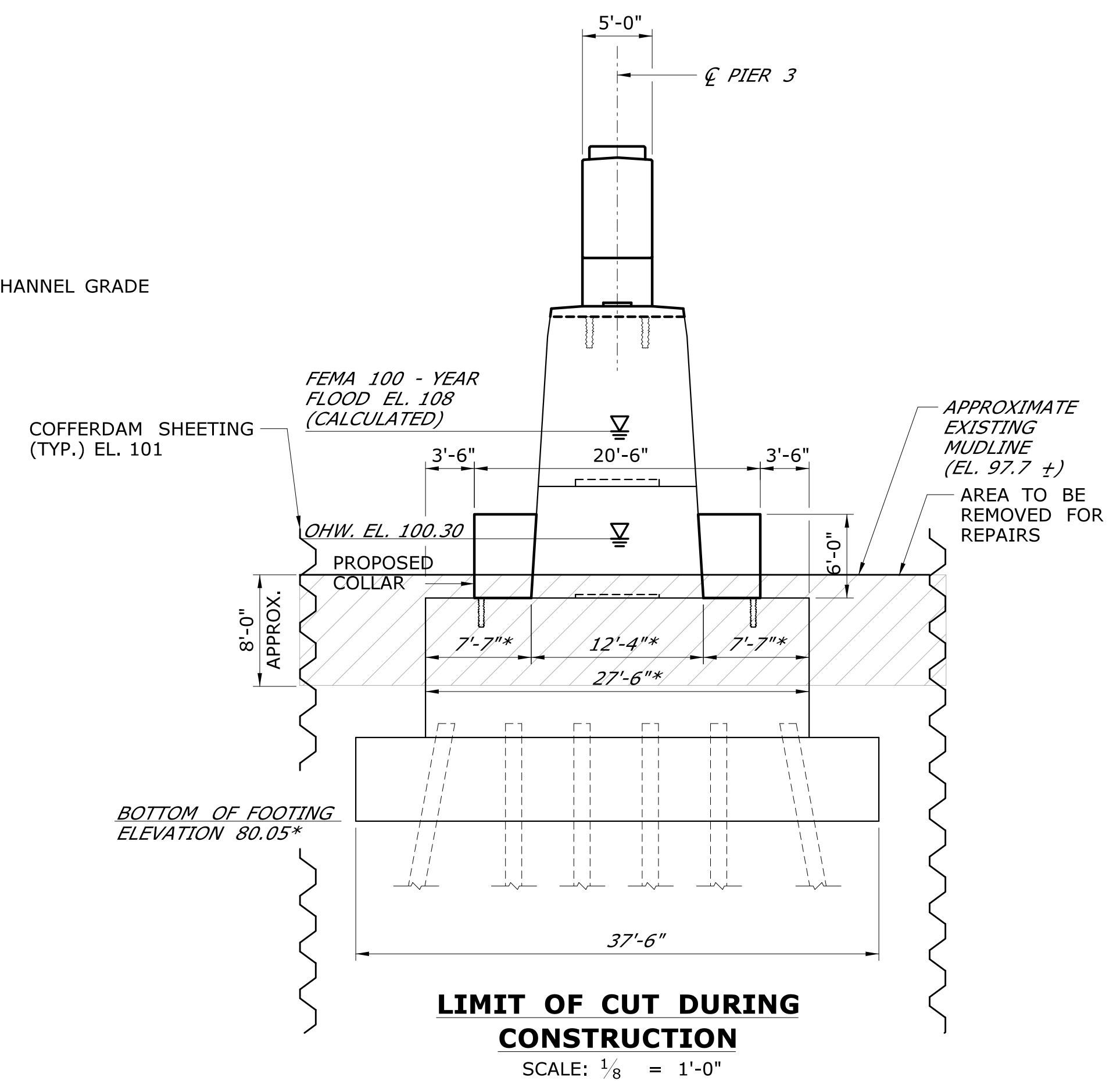
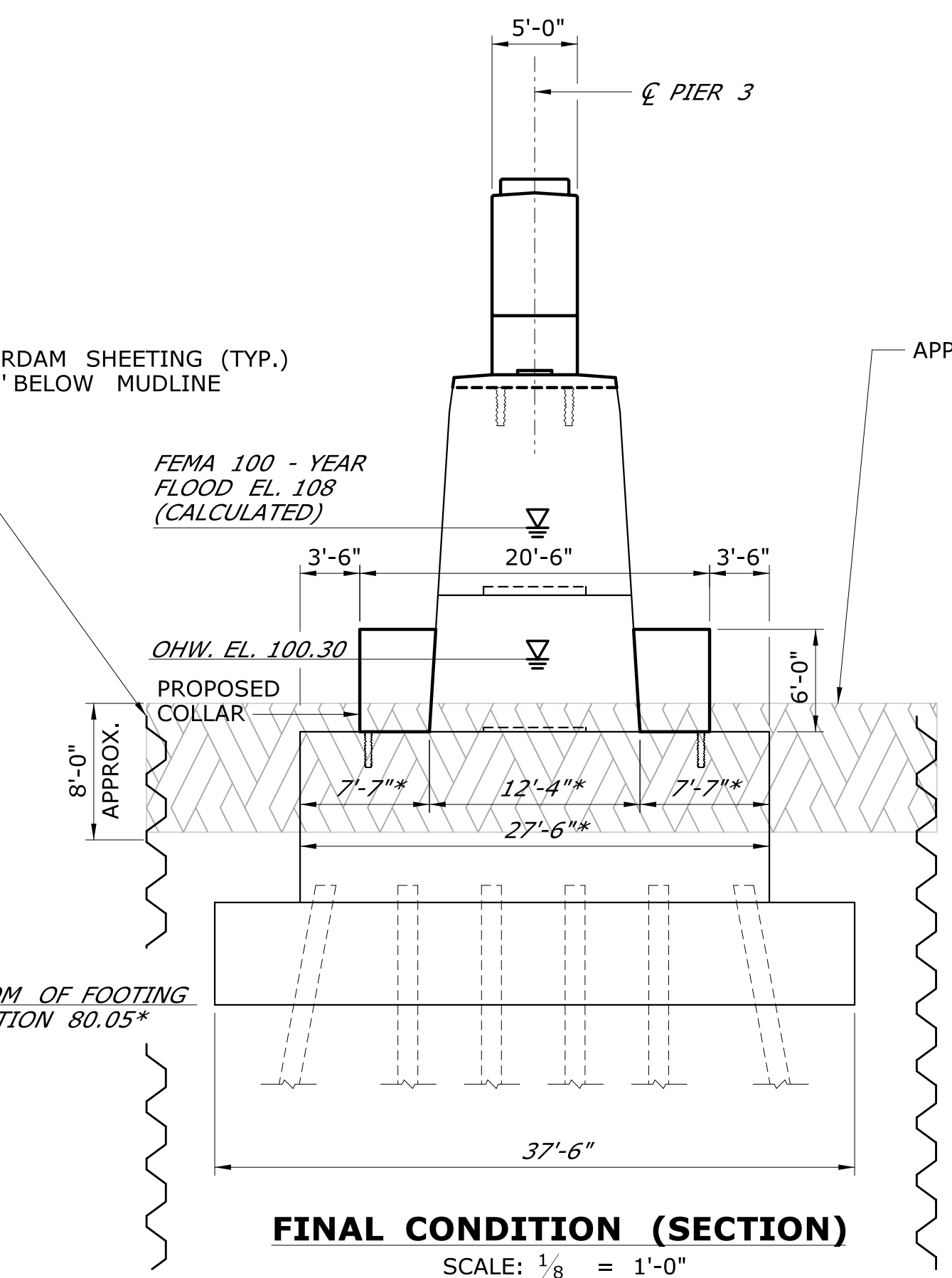
LEGEND

 EXCAVATION

 NATURAL STREAMBED MATERIAL



* PER AS BUILT INFORMATION

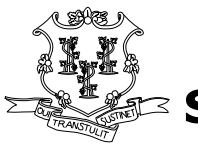


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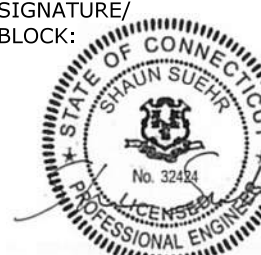
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Plotted Date: 9/27/2019

DESIGNER/DRAFTER: **AJM**
 CHECKED BY: **JPM**
 SCALE AS NOTED

 **STATE OF CONNECTICUT**
DEPARTMENT OF TRANSPORTATION

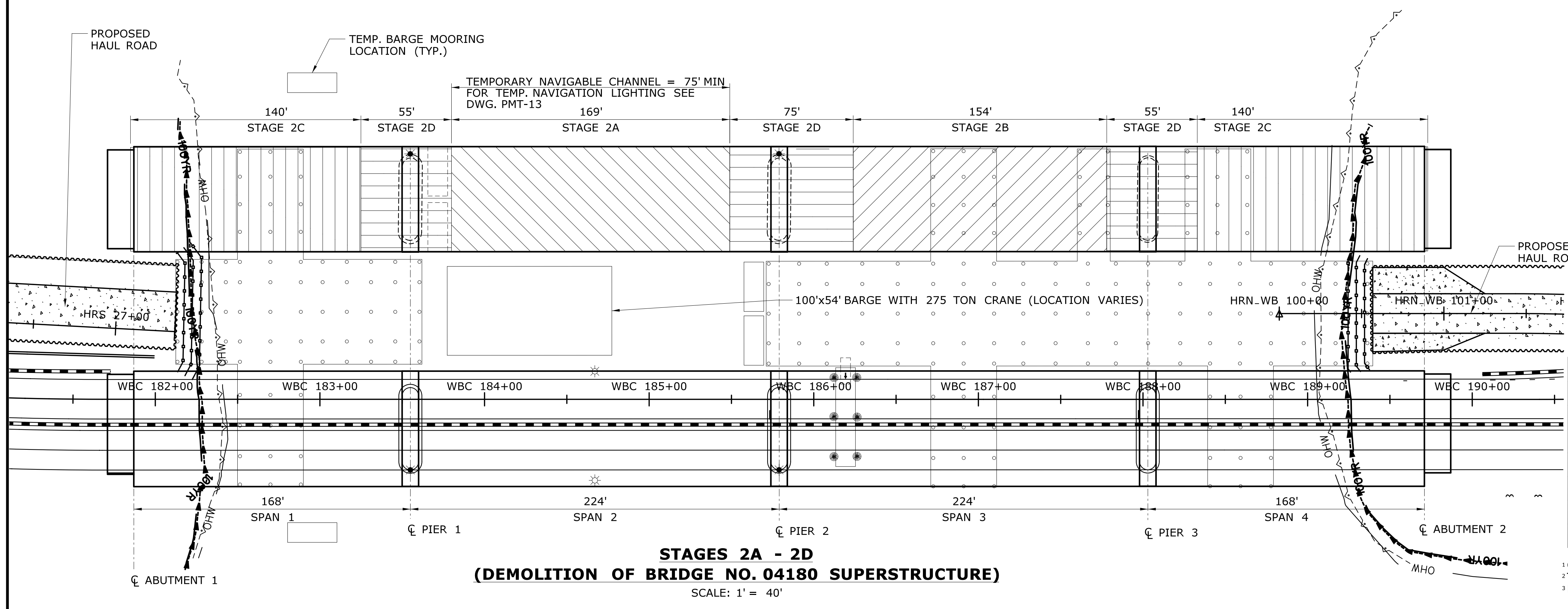
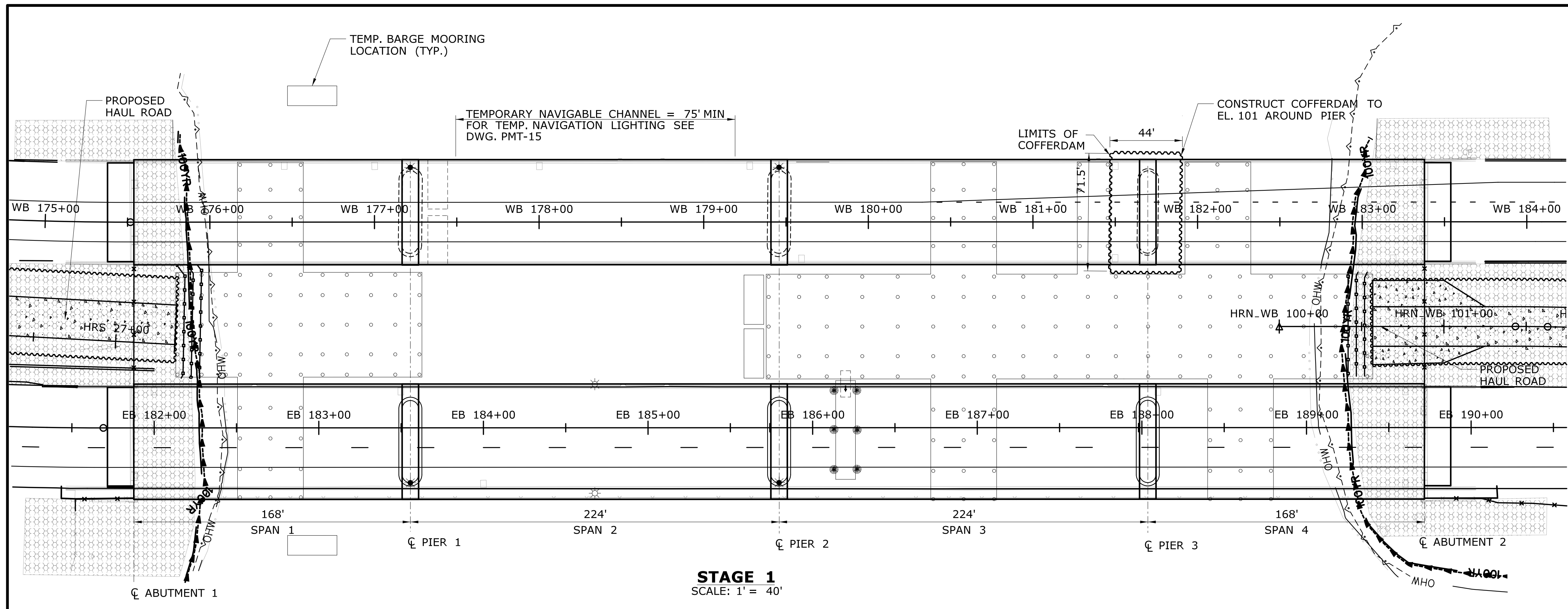
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SIGNATURE/BLOCK:  **LOUIS BERGER US**
 A WSP COMPANY
 55 CAPITAL BOULEVARD
 ROCKY HILL, CT 06067

PROJECT TITLE: **REHABILITATION OF BRIDGE NO. 04180- I-84 WB OVER HOUSATONIC RIVER**

TOWN: **NEWTOWN/SOUTHBURY**
 DRAWING TITLE: **I-84 WB PIER 3 CUT/FILL LIMITS**

PROJECT NO. **96-201**
 DRAWING NO. **PMT-06**
 SHEET NO.



- NOTES:**
- CONTRACTOR BARGES AND WORK BOATS TO BE TIED OFF OR ANCHORED WITH SPUDS IN SPANS 1 & 3 WHEN NOT IN USE.
- STAGE 1 - SUGGESTED CONSTRUCTION SEQUENCE:**
- INSTALL SEDIMENTATION CONTROL SYSTEM.
 - PERFORM THE CONTROL AND REMOVAL OF INVASIVE SPECIES LOCATED WITHIN THE DISTURBED AREAS IN ACCORDANCE WITH ITEM #0952051A - CONTROL AND REMOVAL OF INVASIVE VEGETATION.
 - CONSTRUCT HAUL ROADS IN APPROACHES.
 - DRIVE PILES AND BUILD TEMPORARY TRESTLES AND CONSTRUCT A COFFERDAM AROUND PIER 3. CONSTRUCTION OF TEMPORARY TRESTLES SHALL BE FROM BARGES OR OTHER FLOATED PLATFORMS. THE CONTRACTOR SHALL NOT LAUNCH BARGES FROM STATE OWNED BOAT LAUNCH.
 - PLACE SIGNS AND CHANNEL MARKERS TO DELINEATE TEMPORARY CHANNEL FOR BOAT TRAFFIC. BLOCKAGE OF NAVIGATION CHANNEL FOR DEMOLITION AND CONSTRUCTION SHALL REQUIRE THE PRIOR WRITTEN PERMISSION OF THE ENGINEER.
 - CONSTRUCT CROSSOVER ROADWAY IN MEDIAN AND TEMPORARY ROAD CLOSURES FOR IN ROAD PREP WORK FOR CROSSOVER.
- STAGE 2A - SUGGESTED CONSTRUCTION SEQUENCE:**
- INSTALL DEBRIS SHIELD
 - REMOVE PARAPETS, DECK, STRINGERS, AND FLOORBEAM CANTILEVERS FROM ALL OF SPANS.
 - INSTALL TEMPORARY SUPPORTS/BRACING AT PIER 1 AND PIER 2 TO PROVIDE ADDITIONAL SUPPORTS FOR PRIMARY GIRDERS.
 - REMOVE FLOORBEAMS AND LATERAL BRACING FROM CENTER OF SPAN IN AREA INDICATED.
 - REMOVE MID-SPAN SECTION OF MAIN GIRDERS IN AREA INDICATED.
- NOTE: ESTIMATED DURATION OF NAVIGATION CHANNEL BLOCKAGE IS ONE (1) DAY.**
- STAGE 2B - SUGGESTED CONSTRUCTION SEQUENCE:**
- INSTALL TEMPORARY SUPPORTS AT PIER TO PROVIDE ADDITIONAL SUPPORTS FOR CANTILEVERS.
 - REMOVE FLOORBEAMS, AND LATERAL BRACING FROM CENTER OF SPAN AS INDICATED.
 - REMOVE MID-SPAN SECTION OF MAIN GIRDERS AS INDICATED.
- STAGE 2C - SUGGESTED CONSTRUCTION SEQUENCE:**
- REMOVE FLOORBEAMS AND LATERAL BRACING FROM END OF SPANS AS INDICATED.
 - REMOVE END SECTION OF MAIN GIRDERS AS INDICATED.
- STAGE 2D - SUGGESTED CONSTRUCTION SEQUENCE:**
- INSTALL TEMPORARY BRACING TO STABILIZE MAIN GIRDERS DURING FLOORBEAM AND LATERAL BRACING REMOVAL.
 - REMOVE REMAINING FLOORBEAMS, AND LATERAL BRACING.
 - REMOVE REMAINING SECTIONS OF MAIN GIRDERS.
- NOTE: NAVIGATION CHANNEL SHALL BE CLOSED TO BOAT TRAFFIC DURING DURATION OF STEEL PICKS WITHIN SPAN 2. ESTIMATED DURATION = 2 DAYS.**

LEGEND:

- GREEN NAVIGATIONAL LIGHT
- RED NAVIGATIONAL LIGHT
- 100YR FEMA 100-YEAR FLOOD (CALCULATED)
- OHW ORDINARY HIGH WATER
- FIRSTLIGHT PROJECT BOUNDRY
- STATE/FEDERAL WETLANDS
- SEDIMENTATION CONTROL SYSTEM (SCS)
- TEMPORARY EARTH RETAINING SYSTEM (TERS)
- STAGE 2A
- STAGE 2B
- STAGE 2C
- STAGE 2D
- INVASIVE SPECIES CONTROL AREA

TEMPORARY HYDRAULIC DATA	
AVERAGE DAILY FLOW (CFS)	2,500 ¹
AVERAGE SPRING FLOW (CFS)	5,000 ¹
2-YEAR FREQUENCY DISCHARGE (CFS)	20,000 ²
TEMPORARY DESIGN DISCHARGE (CFS)	42,000 ³
TEMPORARY DESIGN FREQUENCY (YRS)	10
TEMPORARY WATER SURFACE ELEV (FT) - UPSTREAM	100 ³
TEMPORARY WATER SURFACE ELEV (FT) - DOWNSTREAM	100 ³

NOTE: ELEVATIONS PROVIDED ARE REFERENCED TO NAVD88 DATUM.
¹CALCULATED AS PER CTDOT DRAINAGE MANUAL SEC. 6.16 BASED ON DRAINAGE AREA.
²TRANSFERRED FROM GAGE NO. 01205500 ON HOUSATONIC RIVER.
³FAIRFIELD COUNTY FLOOD INSURANCE STUDY, OCT. 16, 2013

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 9/24/2019

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CHECKED BY: JPM	
SCALE AS NOTED	

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Signature/Block: LOUIS BERGER US
A WSP COMPANY
55 CAPITAL BOULEVARD
ROCKY HILL, CT 06067

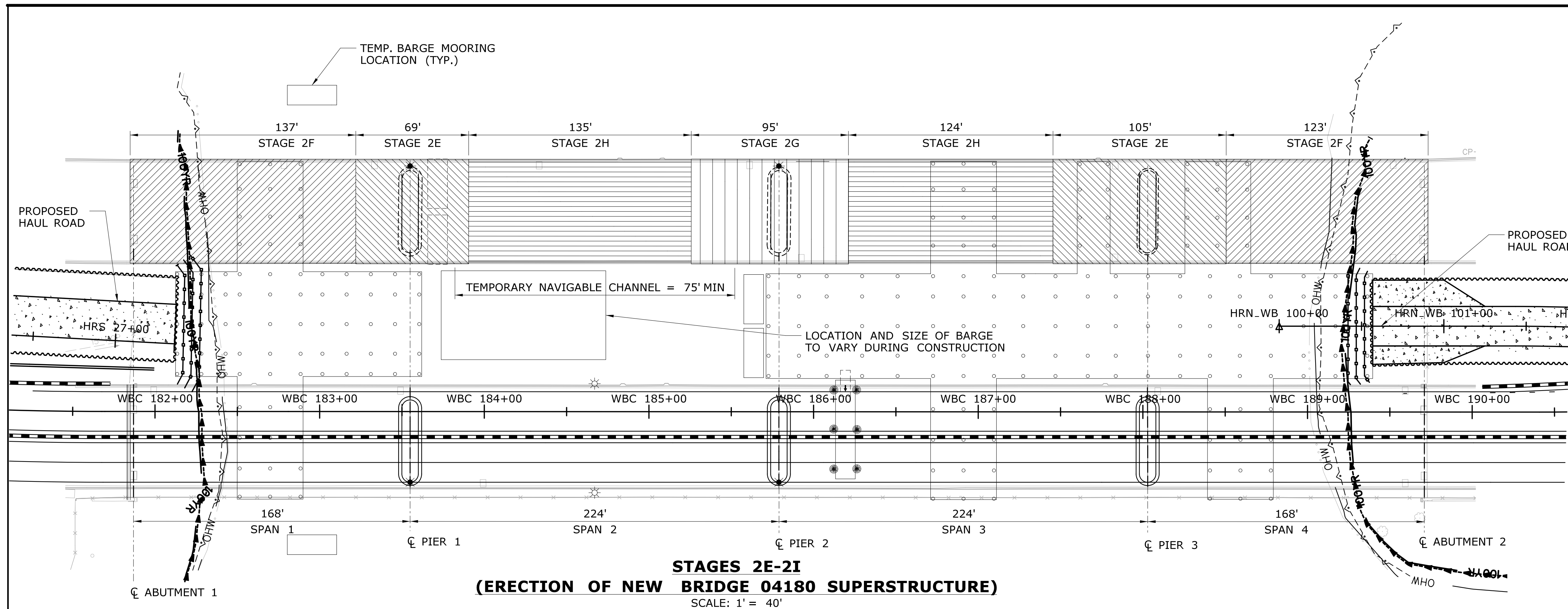
PROJECT TITLE:
REHABILITATION OF BRIDGE NOS 01218 & 04180- I-84 EB/WB OVER HOUSATONIC RIVER

TOWN: NEWTOWN/SOUTHBURY	PROJECT NO. 96-201
DRAWING TITLE: CONSTRUCTION STAGING - 1	DRAWING NO. PMT-07
	SHEET NO.

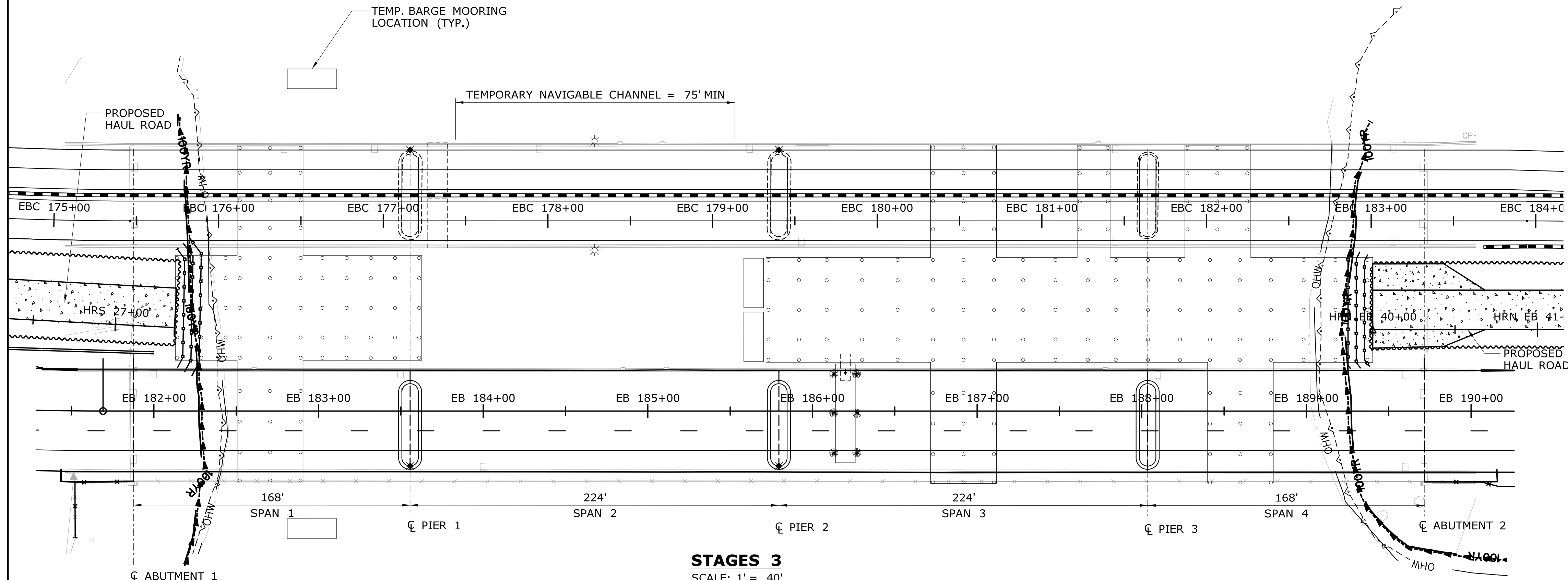
REV.	DATE	REVISION DESCRIPTION	SHEET NO.

Plotted Date: 9/27/2019

Filename: ...SB_MSTL_0096_0201_PMT-07.dgn



**STAGES 2E-2I
(ERECTION OF NEW BRIDGE 04180 SUPERSTRUCTURE)**
SCALE: 1' = 40'



STAGES 3
SCALE: 1' = 40'

NOTES:

1. CONTRACTOR BARGES AND WORK BOATS TO BE TIED OFF OR ANCHORED WITH SPUDS IN SPANS 1 & 3 WHEN NOT IN USE.

STAGE 2E - SUGGESTED CONSTRUCTION SEQUENCE:

1. COMPLETE SUBSTRUCTURE REPAIRS TO PIERS AND ABUTMENTS FROM TRESTLE, FINGERS AND/OR BARGES.
2. COMPLETE MODIFICATIONS OF ABUTMENTS AND PIERS (INCLUDES COLLAR CONSTRUCTION AT PIER 3).
3. INSTALL PROPOSED GIRDERS OVER PIER 1 AND PIER3.
4. INSTALL DIAPHRAGMS AND LATERAL BRACING.

STAGE 2F - SUGGESTED CONSTRUCTION SEQUENCE:

1. INSTALL END GIRDER SECTIONS IN SPAN 1 AND SPAN 4 AND SPLICE WITH PREVIOUSLY INSTALLED SECTIONS OVER PIER 1 AND PIER 3, RESPECTIVELY.
2. INSTALL DIAPHRAGMS AND LATERAL BRACING IN SPAN 1 AND SPAN 4.

STAGE 2G - SUGGESTED CONSTRUCTION SEQUENCE:

1. INSTALL PROPOSED GIRDERS OVER PIER 2 AND TEMPORARILY SUPPORT CANTILEVERS.
2. INSTALL DIAPHRAGMS AND LATERAL BRACING.

STAGE 2H - SUGGESTED CONSTRUCTION SEQUENCE:

1. INSTALL REMAINING MID-SPAN GIRDER SECTIONS IN SPAN 2 AND SPAN 3 AND SPLICE WITH PREVIOUSLY INSTALLED SECTIONS OVER PIER 1, PIER 2, AND PIER 3, RESPECTIVELY.
2. INSTALL ALL REMAINING DIAPHRAGMS AND LATERAL BRACING.

STAGE 2I - SUGGESTED CONSTRUCTION SEQUENCE:

1. REMOVE TEMPORARY SUPPORTS AT ALL PIERS.
2. BACKFILL WORK AREA AT PIER 3 COLLAR WITH NATURAL STREAMBED MATERIAL.
3. REMOVE COFFERDAM FROM PIER 3. CUT SHEETING A MINIMUM OF 1' BELOW MUDLINE.
4. INSTALL PROPOSED DECK AND PARAPETS.

NOTE: NAVIGATION CHANNEL SHALL BE CLOSED FOR DURATION OF STEEL PICKS OCCURRING IN SPAN 2 DURING ANY STAGE. ESTIMATED DURATION = 3 DAYS.

STAGE 3 - SUGGESTED CONSTRUCTION SEQUENCE:

1. REMOVE CROSSOVER ROADWAY IN MEDIAN AND RE-ROUTE TRAFFIC TO NEW BRIDGE.
2. CONSTRUCT NEW CROSSOVER ROADWAY IN MEDIAN AND TEMPORARY ROAD CLOSURES FOR IN ROAD PREP WORK FOR CROSSOVER.
3. CLOSE EASTBOUND BRIDGE AND RE-ROUTE TRAFFIC OVER CROSSOVER TO NEW BRIDGE.
4. REMOVAL OF EXISTING TEMPORARY GREEN NAVIGATION LIGHT ON EXISTING EASTBOUND BRIDGE AND INSTALLATION OF TEMPORARY GREEN NAVIGATION LIGHT ON NEW WESTBOUND BRIDGE.

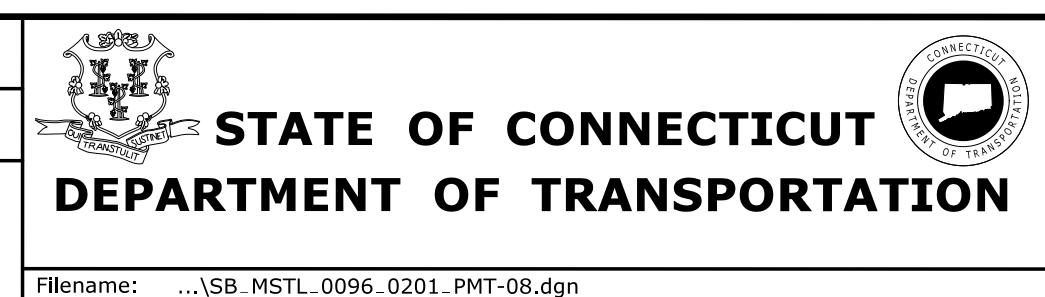
LEGEND:

- GREEN NAVIGATIONAL LIGHT
- RED NAVIGATIONAL LIGHT
- FEMA 100-YEAR FLOOD (CALCULATED)
- ORDINARY HIGH WATER
- FIRSTLIGHT PROJECT BOUNDARY
- STATE/FEDERAL WETLANDS
- SEDIMENTATION CONTROL SYSTEM (SCS)
- TEMPORARY EARTH RETAINING SYSTEM (TERS)
- STAGE 2E
- STAGE 2F
- STAGE 2G
- STAGE 2H

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 9/24/2019

REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 9/24/2019

DESIGNER/DRAFTER:
AJM
CHECKED BY:
JPM
SCALE AS NOTED

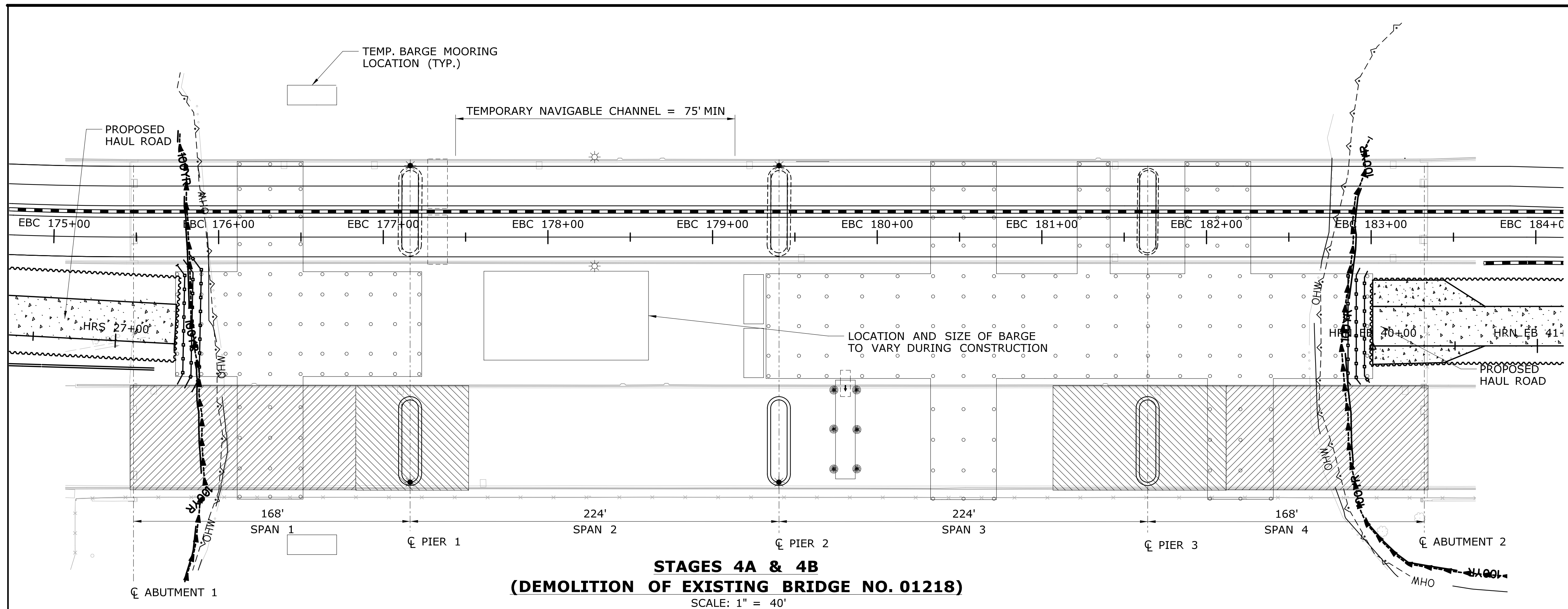


SIGNATURE/BLOCK:
LOUIS BERGER US
A WSP COMPANY
55 CAPITAL BOULEVARD
ROCKY HILL, CT 06067

PROJECT TITLE:
**REHABILITATION OF BRIDGE Nos
01218 & 04180- I-84 EB/WB
OVER HOUSATONIC RIVER**

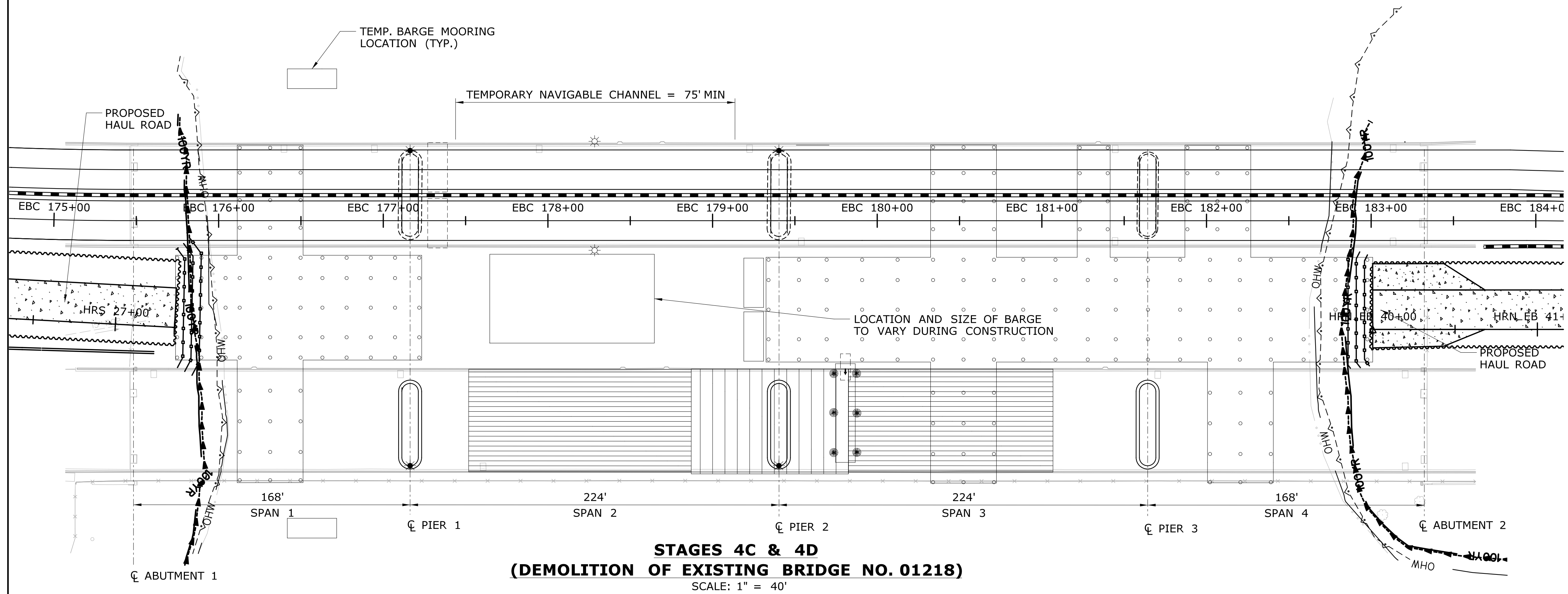
TOWN:
NEWTOWN/SOUTHBURY
DRAWING TITLE:
**CONSTRUCTION
STAGING - 2**

PROJECT NO.
96-201
DRAWING NO.
PMT-08
SHEET NO.



NOTES:

- CONTRACTOR BARGES AND WORK BOATS TO BE TIED OFF OR ANCHORED WITH SPUDS IN SPANS 1 & 3 WHEN NOT IN USE.
- STAGE 4A - SUGGESTED CONSTRUCTION SEQUENCE:**
- INSTALL DEBRIS SHIELD
 - REMOVE PARAPETS, DECK, STRINGERS, AND FLOORBEAM CANTILEVERS FROM ALL SPANS.
 - INSTALL TEMPORARY SUPPORTS/BRACING AT PIERS 1 AND 2 TO PROVIDE ADDITIONAL SUPPORTS FOR PRIMARY GIRDERS.
 - REMOVE FLOORBEAMS AND LATERAL BRACING FROM CENTER OF SPAN IN AREA INDICATED.
 - REMOVE MID-SPAN SECTION OF MAIN GIRDERS IN AREA INDICATED.
- STAGE 4B - SUGGESTED CONSTRUCTION SEQUENCE:**
- INSTALL TEMPORARY SUPPORTS AT PIER 3 TO PROVIDE ADDITIONAL SUPPORTS FOR CANTILEVERS.
 - REMOVE FLOORBEAMS AND LATERAL BRACING FROM CENTER OF SPAN AS INDICATED.
 - REMOVE MID-SPAN SECTION OF MAIN GIRDERS AS INDICATED.
- STAGE 4C - SUGGESTED CONSTRUCTION SEQUENCE:**
- INSTALL PROPOSED GIRDERS OVER PIER 2 AND TEMPORARILY SUPPORT CANTILEVERS.
 - INSTALL DIAPHRAGMS AND LATERAL BRACING.
- STAGE 4D - SUGGESTED CONSTRUCTION SEQUENCE:**
- INSTALL REMAINING MID-SPAN GIRDER SECTIONS IN SPAN 2 AND SPAN 3 AND SPLICE WITH PREVIOUSLY INSTALLED SECTIONS OVER PIER 1, PIER 2, AND PIER 3, RESPECTIVELY.
 - INSTALL ALL REMAINING DIAPHRAGMS AND LATERAL BRACING.

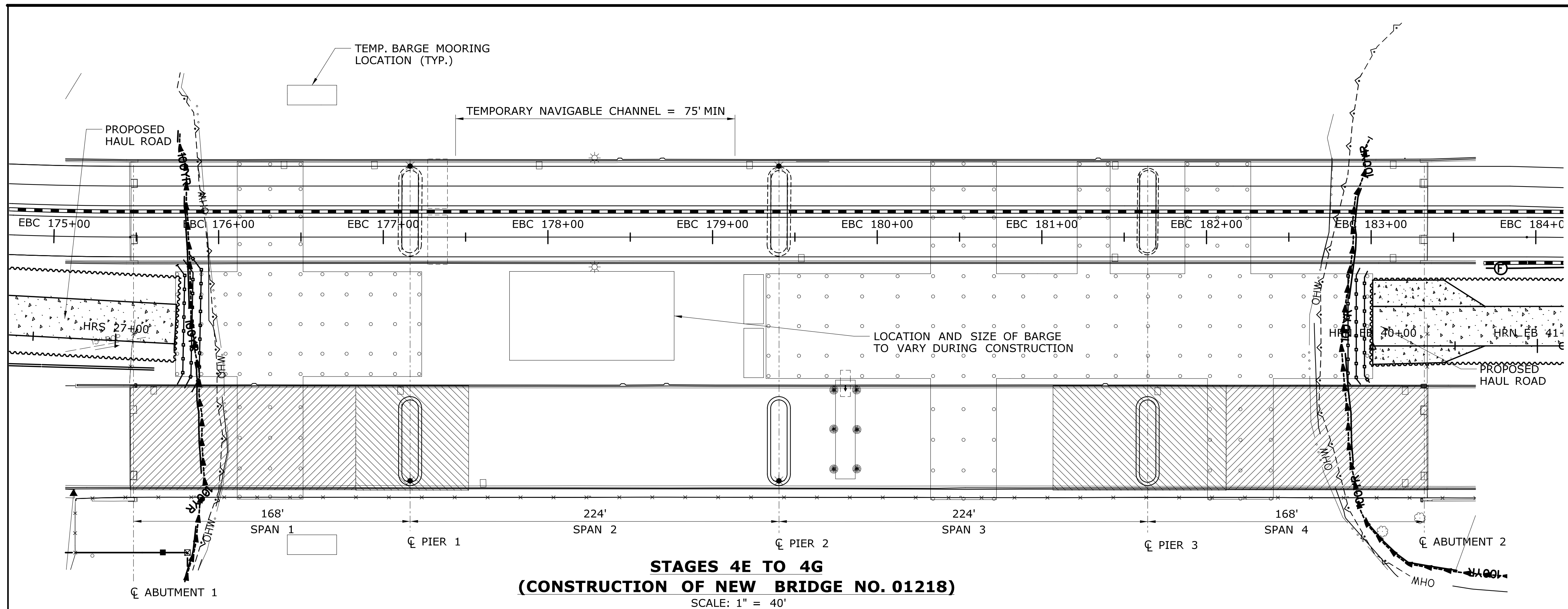


LEGEND:

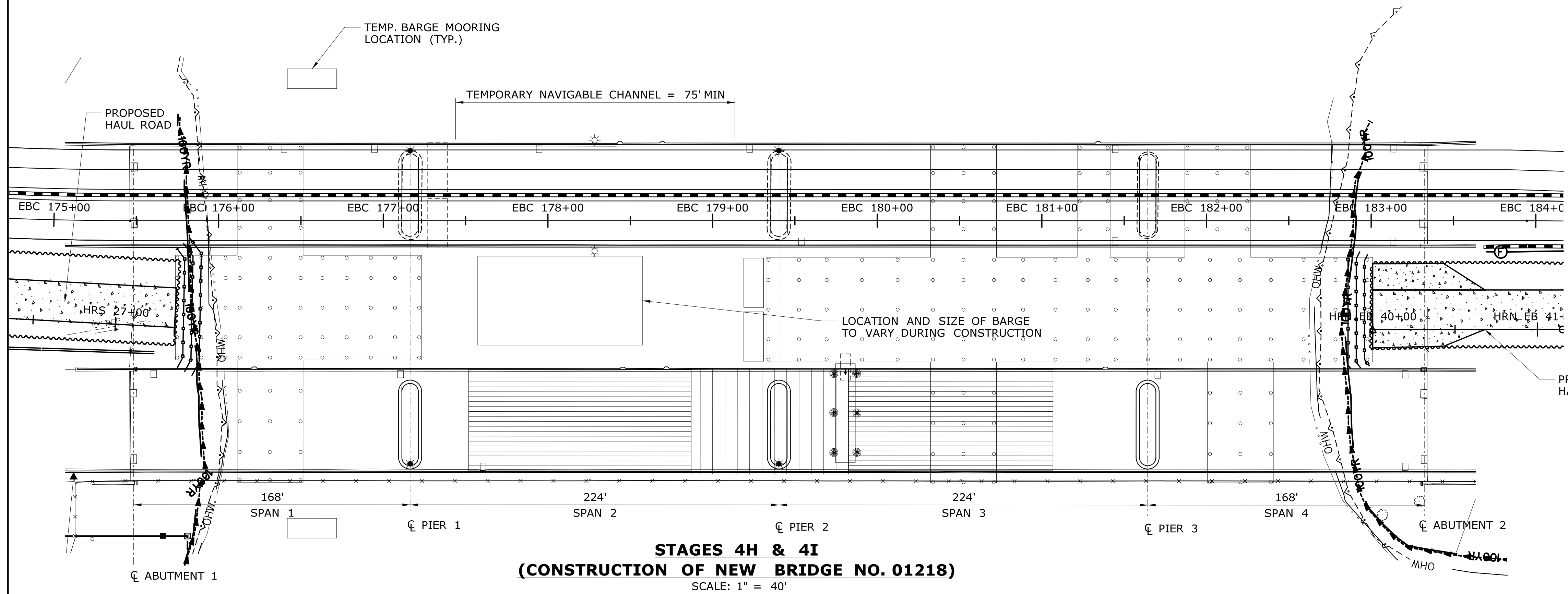
- GREEN NAVIGATIONAL LIGHT
- RED NAVIGATIONAL LIGHT
- FEMA 100-YEAR FLOOD (CALCULATED)
- ORDINARY HIGH WATER
- FIRSTLIGHT PROJECT BOUNDARY
- STATE/FEDERAL WETLANDS
- SEDIMENTATION CONTROL SYSTEM (SCS)
- TEMPORARY EARTH RETAINING SYSTEM (TERS)
- STAGE 4A
- STAGE 4B
- STAGE 4C
- STAGE 4D

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 9/24/2019

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.				DESIGNER/DRAFTER: AJM CHECKED BY: JPM SCALE AS NOTED		 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION		SIGNATURE/BLOCK: LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067		PROJECT TITLE: REHABILITATION OF BRIDGE Nos 01218 & 04180- I-84 EB/WB OVER HOUSATONIC RIVER		TOWN: NEWTOWN/SOUTHBURY		PROJECT NO. 96-201	
REV. DATE REVISION DESCRIPTION SHEET NO. Plotted Date: 9/24/2019				FILENAME: ...\\SB_MSTL_0096_0201_PMT-09.dgn				DRAWING TITLE: CONSTRUCTION STAGING - 3		DRAWING NO. PMT-09		SHEET NO.			



- STAGE 4E - SUGGESTED CONSTRUCTION SEQUENCE:**
1. CONSTRUCT NEW PIER CAPS.
 2. CONSTRUCTION OF THE EXISTING ABUTMENT MODIFICATIONS.
- STAGE 4F - SUGGESTED CONSTRUCTION SEQUENCE:**
1. CONSTRUCTION OF NEW DECK IN AREA INDICATED.
- STAGE 4G - SUGGESTED CONSTRUCTION SEQUENCE:**
1. CONSTRUCTION OF NEW DECK IN AREA INDICATED.
- STAGE 4H - SUGGESTED CONSTRUCTION SEQUENCE:**
1. CONSTRUCTION OF NEW DECK IN AREA INDICATED.
- STAGE 4I - SUGGESTED CONSTRUCTION SEQUENCE:**
1. CONSTRUCTION OF NEW DECK IN AREA INDICATED.
 2. CONSTRUCTION OF NEW PARAPETS, SUPERSTRUCTURE AND MISC. REMAINING ITEMS.
 3. REMOVAL OF THE DEBRIS SHIELD.
- STAGE 5 - SUGGESTED CONSTRUCTION SEQUENCE:**
1. REMOVE TEMPORARY M&PT AND RESTORE TRAFFIC PATTERN.
 2. REMOVE ALL TEMPORARY TRESTLE PILES.
 3. REMOVE TEMPORARY TRESTLE AND HAUL ROAD.
 4. REMOVE CROSSOVER AND RESTORE MEDIAN, ESTABLISH NEW TURF AND WILDFLOWERS IN MEDIAN ON ALL DISTURBED AREAS.
 5. REMOVE TEMPORARY BOATING SIGNS.
 6. PROJECT CLOSEOUT ITEMS.



LEGEND:

	GREEN NAVIGATIONAL LIGHT		STAGE 4F
	RED NAVIGATIONAL LIGHT		STAGE 4G
	100YR FEMA 100-YEAR FLOOD (CALCULATED)		STAGE 4H
	OHW ORDINARY HIGH WATER		STAGE 4I
	FIRSTLIGHT PROJECT BOUNDARY		
	STATE/FEDERAL WETLANDS		
	SEDIMENTATION CONTROL SYSTEM (SCS)		
	TEMPORARY EARTH RETAINING SYSTEM (TERS)		

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 9/24/2019

REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 9/24/2019

DESIGNER/DRAFTER: AJM
CHECKED BY: JPM
SCALE AS NOTED

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

Filename: ...\\SB_MSTL_0096_0201_PMT-10.dgn

SIGNATURE/BLOCK:

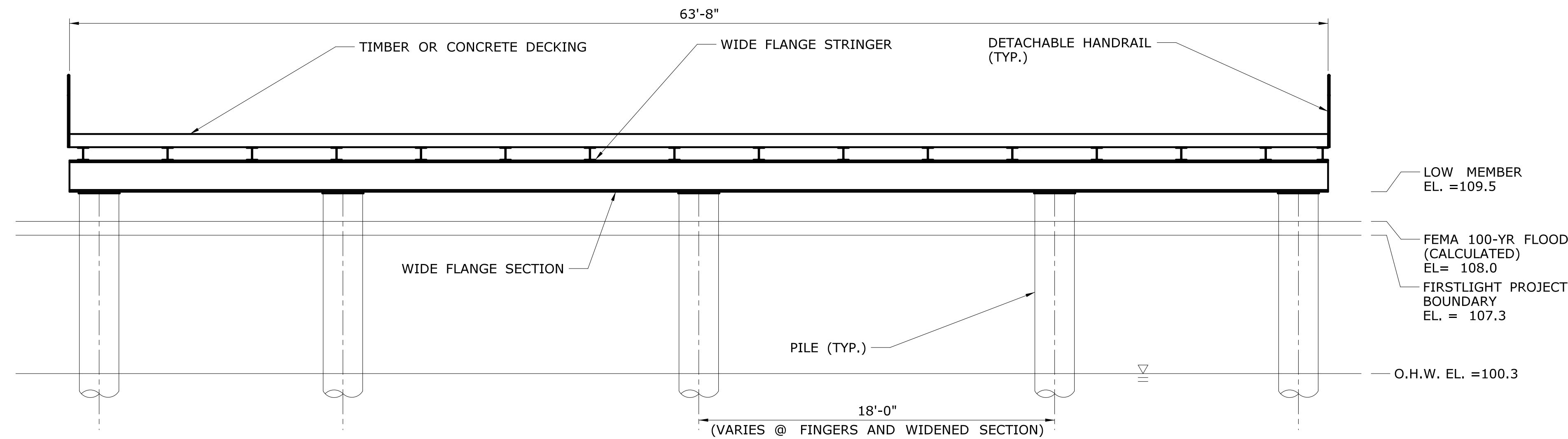
LOUIS BERGER US
A WSP COMPANY
55 CAPITAL BOULEVARD
ROCKY HILL, CT 06067

PROJECT TITLE:
REHABILITATION OF BRIDGE Nos
01218 & 04180- I-84 EB/WB
OVER HOUSATONIC RIVER

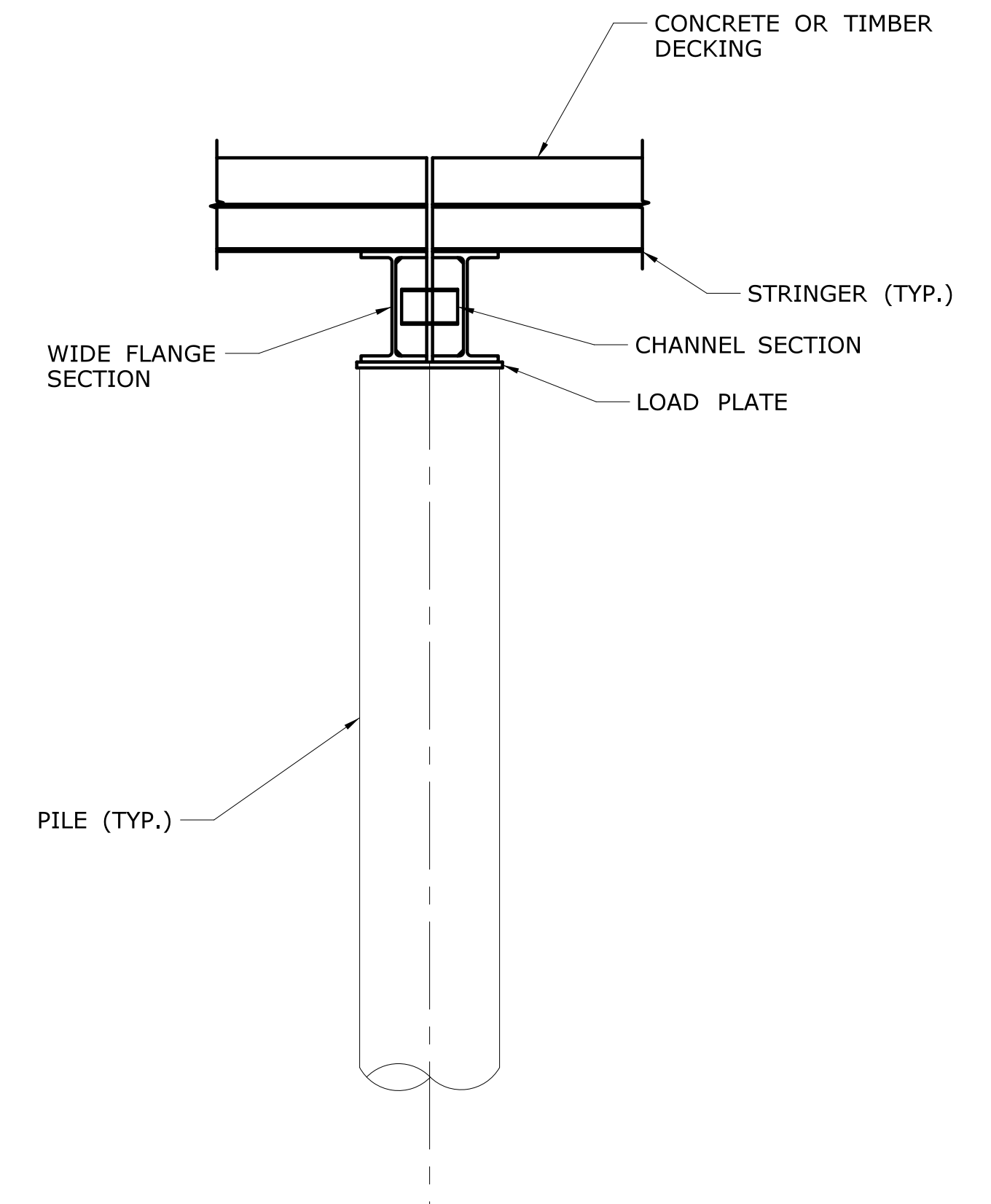
TOWN: NEWTOWN/SOUTHBURY	PROJECT NO. 96-201
DRAWING TITLE: CONSTRUCTION STAGING - 4 & 5	DRAWING NO. PMT-10
	SHEET NO.

NOTES:

1. TEMPORARY TRESTLE AND FALSEWORK SHALL BE DESIGNED BY THE CONTRACTOR IN ACCORDANCE WITH THE AASHTO GUIDE DESIGN SPECIFICATIONS FOR BRIDGE TEMPORARY WORKS 1ST EDITION, 1995 WITH LATEST REVISIONS TO SUIT THE MEANS AND METHODS USED FOR CONSTRUCTION. THE CONTRACTOR'S DESIGN SHALL HAVE A LOW CHORD ELEVATION ABOVE THE FEMA 100-YR FLOOD ELEVATION OF 108.0 FEET.
2. PILES INSTALLED IN THE VICINITY OF THE EXISTING BRIDGE FOUNDATIONS SHALL BE LOCATED TO AVOID POTENTIAL CONFLICTS WITH EXISTING PILES AND OTHER OBSTRUCTIONS.
3. ALL PILES SHALL BE REMOVED DURING TRESTLE REMOVAL. ANY PILES THAT ARE NOT ABLE TO BE REMOVED SHALL BE CUT 2' (MIN.) BELOW THE MUDLINE.
4. THE DESIGN AND CONSTRUCTION OF TEMPORARY WORK TRESTLE, CRANE MATS, FLOATING DOCKS SHALL BE PAID FOR UNDER ITEM NO. 0502185A "TEMPORARY TRESTLE (SITE NO.1) AND ITEM NO. 0502186A "TEMPORARY TRESTLE (SITE NO.2)". SEE SPECIAL PROVISIONS.
5. CONSTRUCTION OF TEMPORARY TRESTLE SHALL BE PERFORMED FROM BARGES, OTHER FLOATED PLATFORMS, OR THE SHORE.
6. THE INFORMATION SHOWN ON THIS DRAWING, INCLUDING (AS APPLICABLE) SIZES OF MEMBERS, THE SEQUENCE OF CONSTRUCTION, AND ERECTION PROCEDURES CONVEYS THE ASSUMPTIONS MADE BY THE DESIGNER IN DESIGNING THE STRUCTURE, AND IS FOR INFORMATIONAL USE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SELECTING THE MEANS AND METHODS FOR CONSTRUCTION. THE CONTRACTOR SHALL ALSO SUBMIT INFORMATION INCLUDING DESIGN CALCULATIONS, CONSTRUCTION SCHEMATICS, AND CONSTRUCTION SEQUENCES AND PROCEDURES TO THE ENGINEER FOR REVIEW.
7. CONTRACTOR IS HEREBY NOTIFIED THAT ALL TEMPORARY WORKS AND EQUIPMENT SHALL MEET THE REQUIREMENTS OF APPLICABLE U.S. COAST GUARD AND CT DEEP BOATING REGULATIONS AND THE REQUIREMENTS OF THE BOAT SAFETY PLAN. SEE DWG PMT-13 FOR BOAT SAFETY PLAN.
8. BARGES DOCKED OR ANCHORED AT TRESTLE IN SPAN 2 SHALL NOT EXCEED 60' X 100'. MINIMUM CLEAR CHANNEL AS INDICATED ON THE PLANS SHALL BE MAINTAINED AT ALL TIMES UNLESS OTHERWISE APPROVED BY THE ENGINEER.





SECTION THROUGH MAIN TRESTLE
SCALE: 1/4" = 1'-0"



SECTION PILE BENT
SCALE: 1/2" = 1'-0"

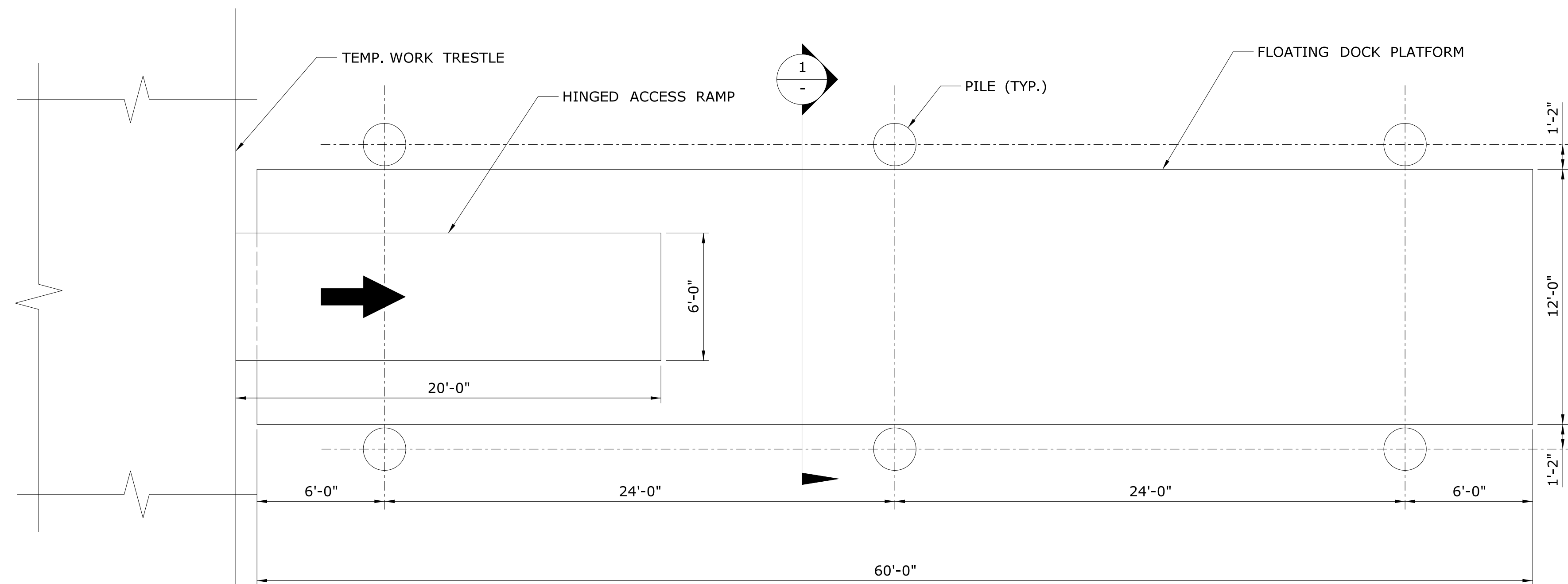
ENVIRONMENTAL PERMIT PLANS

PLAN DATE: 9/24/2019

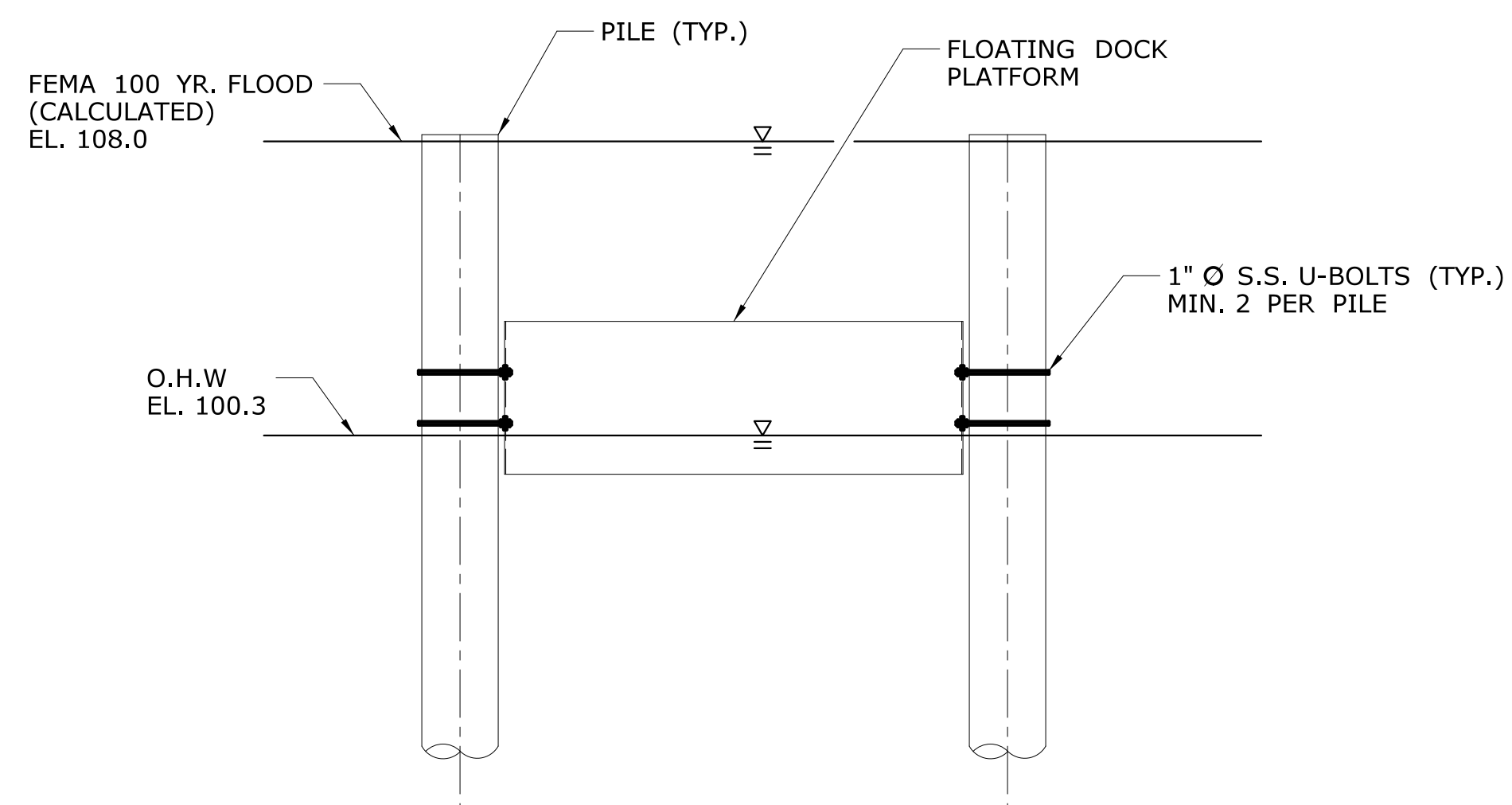
THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.		DESIGNER/DRAFTER: JPM CHECKED BY: JS SCALE AS NOTED	 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION Filename: ...SB_MSTL_0096_0201_PMT-11.dgn	SIGNATURE/BLOCK:  LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067	PROJECT TITLE: REHABILITATION OF BRIDGE NO 01218/04180 - I-84 OVER HOUSATONIC RIVER	TOWN: NEWTOWN/SOUTHBURY	PROJECT NO. 96-201
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 9/27/2019		DRAWING TITLE: TEMPORARY TRESTLE DETAILS 1	DRAWING NO. PMT-11

NOTES:

1. SEE DWG. PMT-11 FOR TRESTLE NOTES.



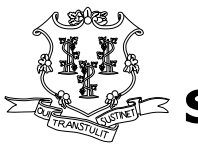

FLOATING DOCK PLAN
SCALE: 1/4" = 1'-0"

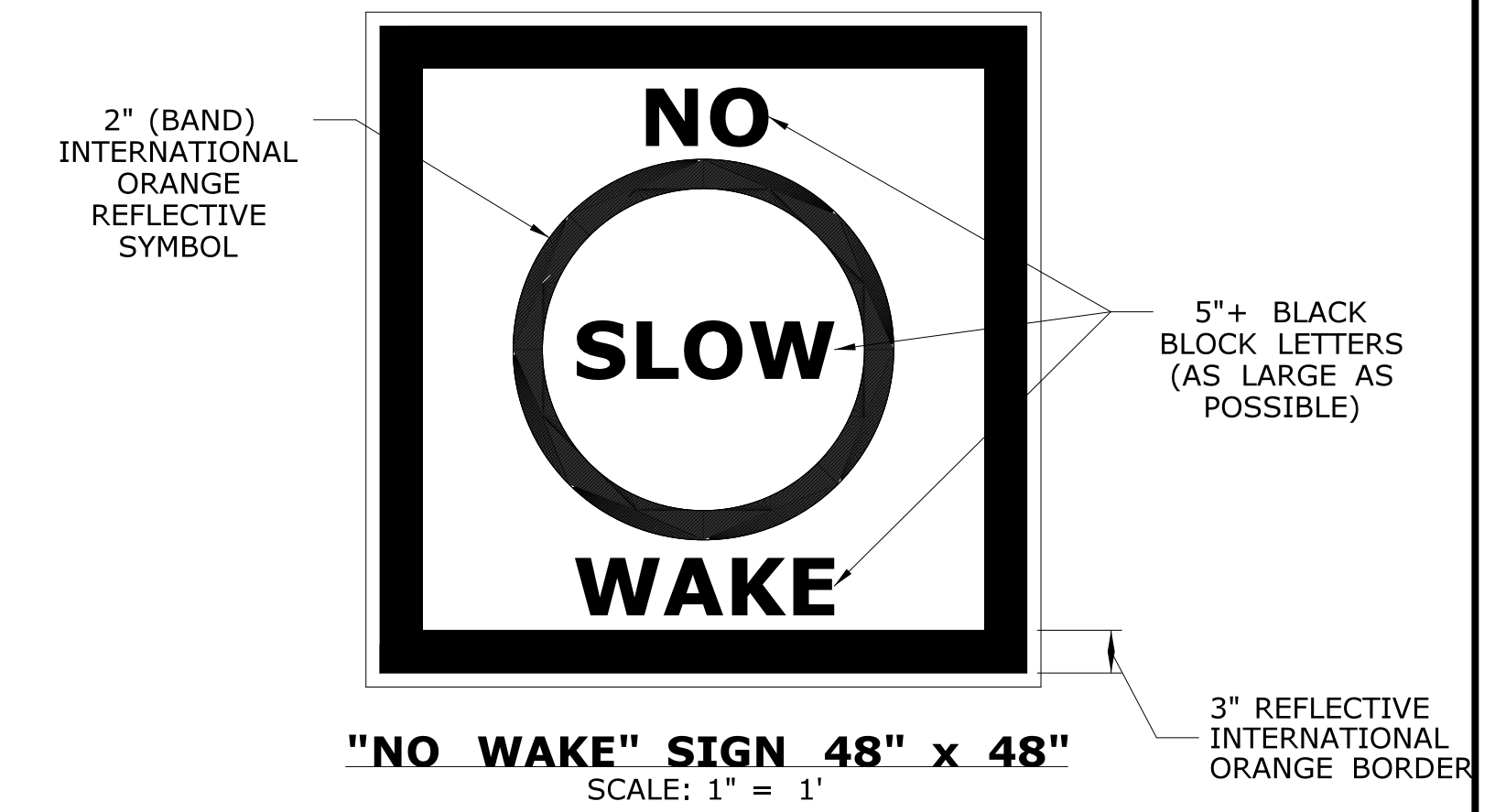
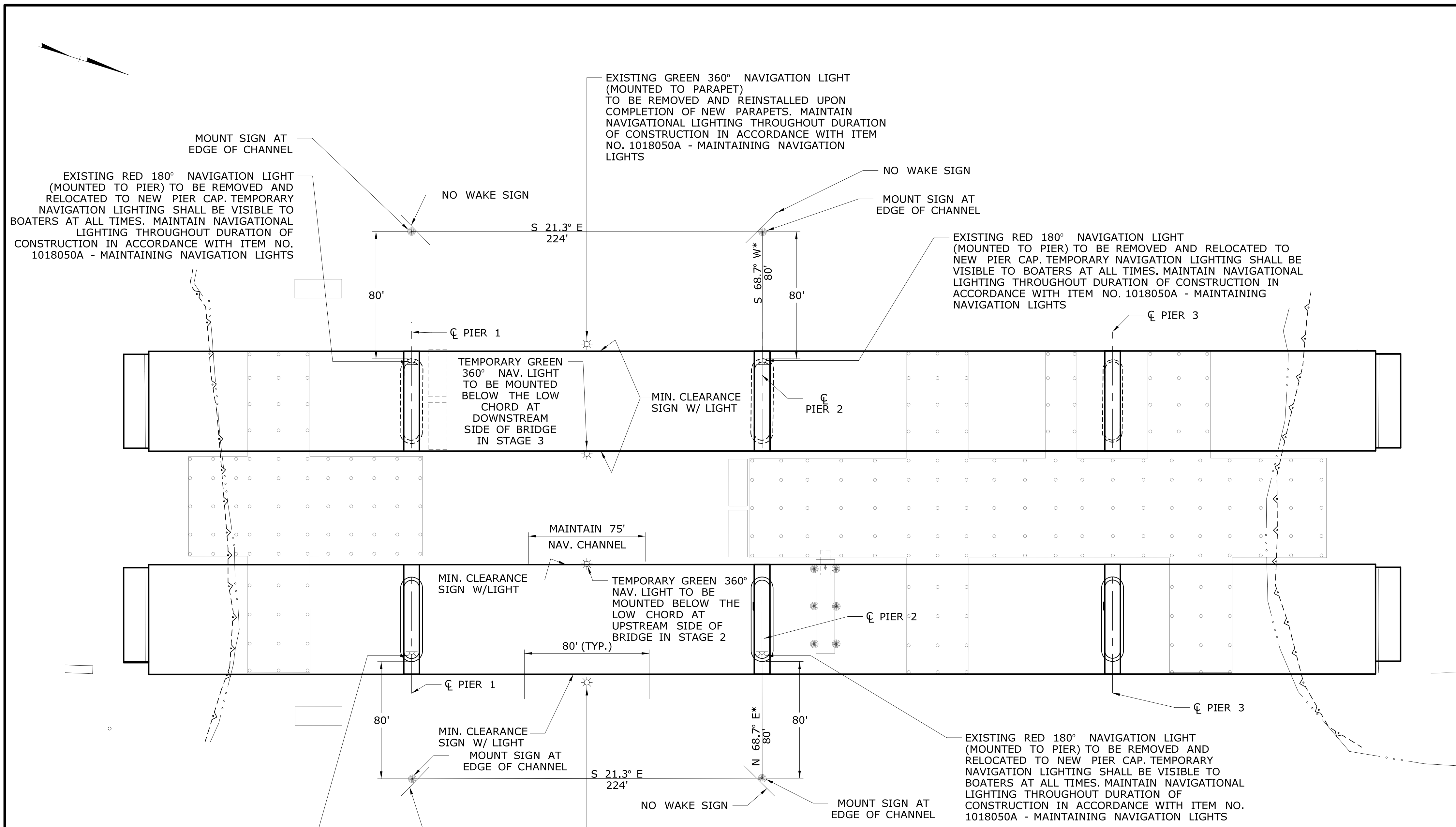


1 SECTION
SCALE: 1/2" = 1'-0"

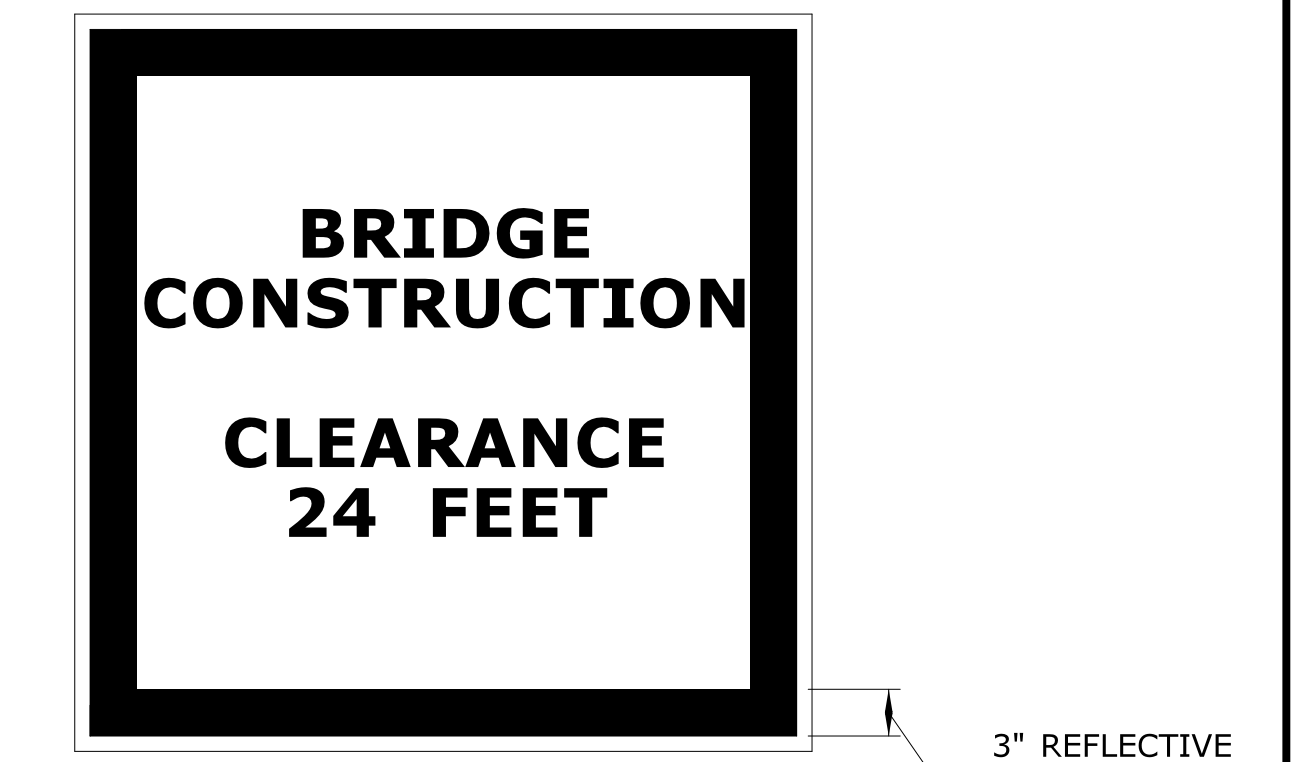
ENVIRONMENTAL PERMIT PLANS

PLAN DATE: 9/24/2019

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.		DESIGNER/DRAFTER: JPM CHECKED BY: DF SCALE AS NOTED	 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION Filename: ...\\SB_MSTL_0096_0201_PMT-12.dgn	SIGNATURE/BLOCK:  LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067	PROJECT TITLE: REHABILITATION OF BRIDGE NO 01218/04180 - I-84 OVER HOUSATONIC RIVER	TOWN: NEWTOWN/SOUTHBURY	PROJECT NO. 96-201
REV. DATE REVISION DESCRIPTION SHEET NO. Plotted Date: 9/24/2019					DRAWING TITLE: TEMPORARY TRESTLE DETAILS 2	DRAWING NO. PMT-12	SHEET NO.



"NO WAKE" SIGN 48" x 48"
SCALE: 1" = 1'



"MIN. CLEARANCE" SIGN 48" x 48"
SCALE: 1" = 1'

NOTE:
ALL LETTERING ON SIGN MUST BE BLACK, BLOCK IN STYLE AND 3" (MIN.) IN HEIGHT. SIGN BACKGROUND TO BE WHITE (TYP. ALL SIGNS)

BOAT SAFETY PLAN
SCALE: 1" = 40'

NOTES:

1. ALL TEMPORARY WORKS AND EQUIPMENT SHALL MEET THE REQUIREMENTS OF THE US COAST GUARD AND CT DEEP BOATING.
2. ALL WORK AND MATERIALS REQUIRED TO ESTABLISH, MAINTAIN AND REMOVE BUOYS, SIGNS, LIGHTS AND CHANNEL MARKERS AS SHOWN ON THE BOAT SAFETY PLAN OR OTHERWISE REQUIRED BY THE COAST GUARD, DEEP BOATING OR THE ENGINEER SHALL BE INCLUDED AND PAID FOR UNDER ITEM NUMBER 1018013 "TEMPORARY WATERWAY CONSTRUCTION MARKERS". SEE SPECIAL PROVISIONS.
3. NAVIGATION LIGHTS ATTACHED TO BRIDGE SHALL REMAIN ON AT ALL TIMES IN ACCORDANCE WITH ITEM NO. 1018050A - MAINTAINING NAVIGATION LIGHTS.
4. FULL NAVIGATION CHANNEL CLOSURES SHALL NOT OCCUR DURING WEEKENDS FROM MAY 1ST UNTIL OCTOBER 1ST
5. CONTRACTOR BARGES AND WORK BOATS TO BE TIED OFF OR ANCHORED WITH SPUDS IN SPANS 1 & 3 WHEN NOT IN USE.
6. DEEP BOATING AND THE LAKE ZOAR AUTHORITY MUST BE CONTACTED PRIOR TO CHANNEL CLOSURES.
7. BEACONS (SIGNS) MUST BE MANUFACTURED OF EIGHTY GAUGE ALUMINUM OR POLYMER OF HARD PLASTIC EQUIVALENT AT LEAST THREE MILLS THICK, OR THREE- QUARTER INCH (3/4") MARINE GRADE PLYWOOD. THEY MUST BE REFLECTIVE WHITE WITH AN INTERNATIONAL ORANGE BAND OF AT LEAST THREE INCHES (3") IN WIDTH FORMING THE OUTER BORDER. ALL SIGNS MUST BE ILLUMINATED

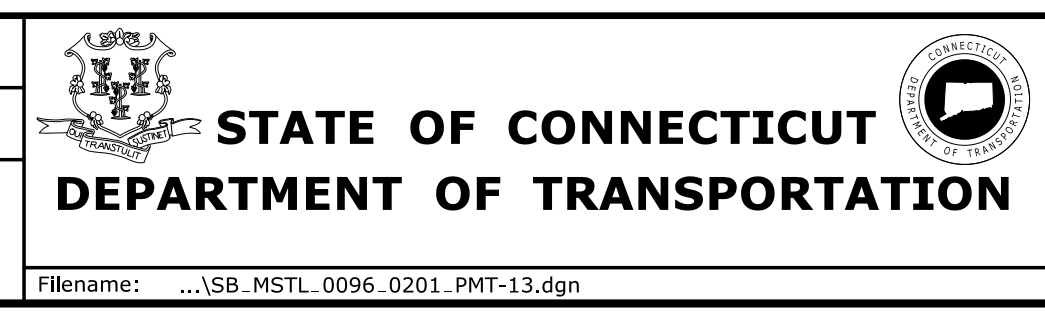
LEGEND:

- ☼ 360° GREEN NAVIGATION LIGHT
- ☼ 180° RED NAVIGATION LIGHT

* COMPASS BEARING AND DISTANCE BEGINS AT THE FACE OF CENTER LINE OF PIER

REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 9/24/2019

DESIGNER/DRAFTER: MEB
CHECKED BY: JPM
SCALE AS NOTED



SIGNATURE/BLOCK:
LOUIS BERGER US
A WSP COPMPANY
55 CAPITAL BOULEVARD
ROCKY HILL, CT 06067

PROJECT TITLE:
REHABILITATION OF BRIDGE NOS 01218 & 04180 - I-84 EB/WB OVER HOUSATONIC RIVER

TOWN: NEWTOWN/SOUTHBURY	PROJECT NO. 96-201
DRAWING TITLE: TEMPORARY NAVIGATION LIGHTING/ BOAT SAFETY PLAN	DRAWING NO. PMT-13
	SHEET NO.

INTERDEPARTMENTAL
MESSAGE

STATE OF CONNECTICUT

Department of Energy & Environmental Protection
Central Permit Processing Unit

OCT 18 2019

RECEIVED BY

To	NAME, TITLE	DATE
	Central Permit Processing Unit, 1 st Floor	October 15, 2019
	AGENCY, ADDRESS	
	Department of Energy and Environmental Protection, 79 Elm Street, Hartford, CT. 06106	
From	NAME, TITLE	TELEPHONE
	Kimberly C. Lesay, Transportation Assistant Planning Director	860-594-2931
	AGENCY, ADDRESS	
	Department of Transportation, 2800 Berlin Turnpike, Newington, CT. 06131-7546	

Subject: **State Project No. 096-201**
Rehabilitation of Bridge Nos. 01218 and 04180
Interstate 84 Eastbound and Westbound over Housatonic River
Towns of Newtown and Southbury

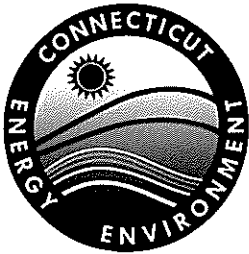
Attached is one original copy of the request for permit authorization for the General Permit for Water Resource Construction Activities (LWRD General Permit) associated with the above referenced project.

Any questions pertaining to this application may be directed to Mr. Jason M. Coite, Transportation Supervising Engineer of my staff, at (860) 594-3448.

Attachments

Naomi C. Hodges /nch

bcc: Rabih M. Barakat – Andrew J. Cardinali – Ryan D. Martin
Kimberly C. Lesay – Kevin F. Carifa – Andrew Piraneo
Jason M. Coite – Michael J. Salter
District 4 Construction – John S. Dunham – Richard N. Symonds
Donald P. Wurst – Tracey Brais (CME)



Connecticut Department of Energy & Environmental Protection

CPPU USE ONLY

App #: _____

Doc #: _____

Check #: _____

Permit Application Transmittal Form

Please complete this transmittal form in accordance with the instructions in order to ensure the proper handling of your application(s) and the associated fee(s). Print legibly or type.

Part I: Applicant Information:

- *If an applicant is a corporation, limited liability company, limited partnership, limited liability partnership, or a statutory trust, it must be registered with the Secretary of State. If applicable, applicant's name shall be stated **exactly** as it is registered with the Secretary of State.*
- *If an applicant is an individual, provide the legal name (include suffix) in the following format: First Name; Middle Initial; Last Name; Suffix (Jr, Sr., II, III, etc.).*

Applicant: Connecticut Department of Transportation			
Mailing Address: 2800 Berlin Turnpike			
City/Town: Newington	State: CT	Zip Code: 06131-7546	
Business Phone: 860-594-2000	ext.:		
Contact Person: Kimberly C. Lesay	Phone: 860-594-2931 ext.		
E-Mail: kimberly.lesay@ct.gov			
Applicant (check one): <input type="checkbox"/> individual <input type="checkbox"/> *business entity <input type="checkbox"/> federal agency <input checked="" type="checkbox"/> state agency <input type="checkbox"/> municipality <input type="checkbox"/> tribal			
*If a business entity, list type (e.g., corporation, limited partnership, etc.):			
<input type="checkbox"/> Check if any co-applicants. If so, attach additional sheet(s) with the required information as supplied above.			
Please provide the following information to be used for <i>billing purposes only</i> , if different:			
Company/Individual Name:			
Mailing Address:			
City/Town:	State:	Zip Code:	
Contact Person:	Phone:	ext.	

Part II: Project Information

Brief Description of Project: <i>(Example: Development of a 50 slip marina on Long Island Sound)</i>					
The rehabilitation of Bridge Nos. 01218 and 04180: Superstructure replacement with pier and abutment modifications. A temporary work trestle will be constructed within the Housatonic River for construction.					
Location (City/Town): Newtown and Southbury					
Other Project Related Permits (<i>not</i> included with this form):					
Permit Description	Issuing Authority	Submittal Date	Issuance Date	Denial Date	Permit #
FM-General	CTDOT	8/19/2019	10/3/2019	N/A	FM-201200688C
Sec. 404 SV	USACE	Concurrently			
Regulatory Marker Permit	DEEP Boating	Concurrently			

Part III: Individual Permit Application and Fee Information

New, Mod. or Renew	Individual Permit Applications	Initial Fees	No. of Permits Applied For	Total Initial Fees	Original + Required Copies
	AIR EMISSIONS				
	New Source Review <input type="checkbox"/> Revision <input type="checkbox"/> minor mod	\$940.00			1 + 0
	Title V Operating Permits <input type="checkbox"/> Revision <input type="checkbox"/> minor mod <input type="checkbox"/> non-minor mod	none			1 + 0
	Title IV	none			1 + 0
	Clean Air Interstate Rule (CAIR)	none			1 + 0
	WATER DISCHARGES				
	To Groundwater	\$1300.00			1 + 1
	To Sanitary Sewer (POTW)	\$1300.00			1 + 1
	To Surface Water (NPDES)	\$1300.00			1 + 1
	WATER PLANNING AND MANAGEMENT				
	Dam Safety	none			1 + 2
	Domestic Sewage Treatment Works (For municipal and private sewage treatment facilities discharging to surface waters)	\$1300.00/ Mod = \$940			1 + 1
	Water Diversion (consumptive) and Registrations	★			1 + 5
	LAND AND WATER RESOURCES				
	Flood Management Certification	none			1 + 1
	Flood Management Certification Exemption	none			1 + 1
	Inland Wetlands and Watercourses (State Agencies Only)	none			1 + 5
	Inland 401 Water Quality Certification	none			1 + 5
	FERC- Hydropower Projects- 401 Water Quality Certification	none			
	Water Diversion (non-consumptive)	★			1 + 5
	Certificate of Permission	\$375.00			1 + 2
	Coastal 401 Water Quality Certification	none			1 + 2
	Structures and Dredging/and Fill/Tidal Wetlands	\$660.00			1 + 2
	WASTE MANAGEMENT				
	Aerial Pesticide Application	★			1 + 2
	Aquatic Pesticide Application	\$200.00			1 + 0
	CGS Section 22a-454 Waste Facilities	★			1 + 1
	Disruption of a Solid Waste Disposal Area	\$0			1 + 1
	Hazardous Waste Treatment, Storage and Disposal Facilities	★			1 + 1
	Marine Terminal License	\$100.00			1 + 0
	Stewardship	\$4000.00			1 + 1
	Solid Waste Facilities	★			1 + 1
	Waste Transportation	★			1 + 0
		Subtotal ➡	0	0	
	GENERAL PERMITS and AUTHORIZATIONS	Subtotals Page 3 & 4 ➡	1	0	
	Enter subtotals from Part IV, pages 3 - 6 of this form	Subtotals Page 5 ➡	0	0	
		Subtotals Page 6 ➡	0	0	
		TOTAL ➡	1	0	
	<input checked="" type="checkbox"/> Indicate whether municipal discount or state waiver applies.			100%	
		Less Applicable Discount			
		AMOUNT REMITTED ➡			
Check # ➡	<input type="text"/>				
					Check or money order should be made payable to: "Department of Energy and Environmental Protection"

★ See fee schedule on individual application.

**Part IV: General Permit Registrations and Requests for Other Authorizations
Application and Fee Information**

✓	General Permits and Other Authorizations	Initial Fees	No. of Permits Applied For	Total Initial Fees	Original + Required Copies
AIR EMISSIONS					
<input type="checkbox"/>	Limit Potential to Emit from Major Stationary Sources of Air Pollution	\$2760.00			1 + 0
<input type="checkbox"/>	Diagnostic and Therapeutic X-Ray Devices (Medical X-Ray) Registration	\$190.00/Xray device			1 + 0
<input type="checkbox"/>	Radioactive Materials and Industrial Device Registration (Ionizing Radiation)	\$200.00			1 + 0
<input type="checkbox"/>	Emergency/Temporary Authorization	★★			★★
<input type="checkbox"/>	License Revocation Request	\$0			★★
<input type="checkbox"/>	Other, (please specify):				
WATER DISCHARGES					
Categorical Industry User to a POTW					
<input type="checkbox"/>	Discharges ≥ 10,000 gpd	\$6250.00			1 + 0
<input type="checkbox"/>	Discharges < 10,000 gpd	\$3125.00			
Comprehensive Discharges to Surface Water and Groundwater					
<input type="checkbox"/>	Registration Only	\$625.00			1 + 0
<input type="checkbox"/>	Approval of Registration by DEEP	\$1250.00			
<input type="checkbox"/>	Domestic Sewage	\$625.00			1 + 0
<input type="checkbox"/>	Food Service Establishment Wastewater	No Registration			
Groundwater Remediation Wastewater					
<input type="checkbox"/>	Registration Only	\$625.00			1 + 0
<input type="checkbox"/>	Approval of Registration by DEEP	\$1250.00			
Miscellaneous Discharges of Sewer Compatible Wastewater					
<input type="checkbox"/>	Registration Only	\$500.00			1 + 0
<input type="checkbox"/>	Approval of Registration by DEEP	\$1000.00			
<input type="checkbox"/>	Nitrogen Discharges	No Registration			
<input type="checkbox"/>	Point Source Discharges from Application of Pesticides	\$200.00			1 + 0
<input type="checkbox"/>	Stormwater Associated with Commercial Activities	\$300.00			1 + 0
Stormwater Associated with Industrial Activities					
<input type="checkbox"/>	No Exposure Certification	\$250.00			1 + 0
<input type="checkbox"/>	<50 employees--see general permit for additional requirements	\$500.00			
<input type="checkbox"/>	>50 employees--see general permit for additional requirements	\$1000.00			
<input type="checkbox"/>	Stormwater & Dewatering Wastewaters-Construction Activities	★			1 + 0
<input type="checkbox"/>	Stormwater from Small Municipal Separate Storm Sewer Systems (MS4)	\$625.00			1 + 0
<input type="checkbox"/>	Stormwater from DOT Separate Storm Sewer Systems (DOT MS4)	\$0			1 + 0
<input type="checkbox"/>	Subsurface Sewage Disposal Systems Serving Existing Facilities	★★			1 + 0
<input type="checkbox"/>	Swimming Pool Wastewater - Public Pools and Contractors	\$500.00			1 + 0
Vehicle Maintenance Wastewater					
<input type="checkbox"/>	Registration Only	\$625.00			1 + 0
<input type="checkbox"/>	Approval of Registration by DEEP	\$1250.00			
<input type="checkbox"/>	Emergency/Temporary Authorization - Discharge to POTW	\$1500.00			1 + 0
<input type="checkbox"/>	Emergency/Temporary Authorization - Discharge to Surface Water	\$1500.00			1 + 0
<input type="checkbox"/>	Emergency/Temporary Authorization - Discharge to Groundwater	\$1500.00			1 + 0
<input type="checkbox"/>	Other, (please specify):				
Note: Carry subtotals over to Part III, page 2 of this form.			Subtotal ➡	0	0

★ See fee schedule on registration/application.

★★ Contact the specific permit program for this information.

(Contact numbers are provided in the instructions)

Part IV: General Permit Registrations and Requests for Other Authorizations (continued)

<input checked="" type="checkbox"/> General Permits and Other Authorizations	Initial Fees	No. of Permits Applied For	Total Initial Fee	Original + Required Copies
AQUIFER PROTECTION PROGRAM				
<input type="checkbox"/> Registration for Regulated Activities	\$625.00			1 + 0
<input type="checkbox"/> Permit Application to Add a Regulated Activity	\$1250.00			1 + 0
<input type="checkbox"/> Exemption Application from Registration	\$1250.00			1 + 0
WATER PLANNING AND MANAGEMENT				
<input type="checkbox"/> Dam Safety Repair and Alteration: Non Filing	No Registration			
<input type="checkbox"/> Dam Safety Repair and Alteration: Filing – No PE	\$100.00			1 + 0
<input type="checkbox"/> Dam Safety Repair and Alteration: Filing – PE	\$200.00			1 + 0
<input type="checkbox"/> Dam Safety Repair and Alteration: Approval of Filing	\$250.00			1 + 0
<input type="checkbox"/> Diversion of Remediation Groundwater	No Registration			
<input type="checkbox"/> Diversion of Water for Consumptive Use: Reauthorization Categories	\$2500.00			1 + 0
<input type="checkbox"/> Diversion of Water for Consumptive Use: Authorization Required	\$2500.00			1 + 4
<input type="checkbox"/> Diversion of Water for Consumptive Use: Filing Only	\$1500.00			1 + 1
<input checked="" type="checkbox"/> Water Resource Construction Activities	★	1	0	1 + 0
<input type="checkbox"/> Emergency/Temporary Authorization	★★			★★
<input type="checkbox"/> Notice of High Hazard Dam or a Significant Hazard Dam	\$0			1 + 0
<input type="checkbox"/> Other, (please specify):				
LAND AND WATER RESOURCES				
Minor Coastal Structures				
<input type="checkbox"/> 4/40 Docks/Access Stairs	\$700.00			1 + 1
<input type="checkbox"/> Beach Grading	No Registration			
<input type="checkbox"/> Buoys or Markers	No Registration			
<input type="checkbox"/> Experimental Activities/Scientific Monitoring Devices	No Registration			
<input type="checkbox"/> Harbor Moorings	No Registration			
<input type="checkbox"/> Non-harbor Moorings	\$250.00			1 + 1
<input type="checkbox"/> Osprey Platforms and Perch Poles	No Registration			
<input type="checkbox"/> Pump-out Facilities	No Registration			
<input type="checkbox"/> Swim Floats	No Registration			
Coastal Maintenance				
<input type="checkbox"/> Backflow Prevention Structure	No Registration			
<input type="checkbox"/> Beach Grading/Raking	No Registration			
<input type="checkbox"/> Catch Basin Cleaning	No Registration			
<input type="checkbox"/> Coastal Remedial Activities Required by Order	\$700.00			1 + 1
<input type="checkbox"/> Coastal Restoration	No Registration			
<input type="checkbox"/> DEEP Boat Launch Infrastructures	No Registration			
<input type="checkbox"/> DOT Infrastructures	No Registration			
<input type="checkbox"/> Marina and Mooring Field Reconfiguration	\$700.00			1 + 1
<input type="checkbox"/> Minor Seawall Repair	No Registration			
<input type="checkbox"/> Placement of Cultch	No Registration			
<input type="checkbox"/> Reconstruction of Legally Existing Structure/Obstruction/Encroachment	\$300.00			1 + 1
<input type="checkbox"/> Removal of Derelict Structures	No Registration			
<input type="checkbox"/> Residential Flood Hazard Mitigation	\$100.00			1 + 1
<input type="checkbox"/> Temporary Access of Construction Vehicles/Equipment	No Registration			
<input type="checkbox"/> Programmatic General Permit	★			1 + 1
<input type="checkbox"/> Emergency/Temporary Authorization				
<input type="checkbox"/> Other, (please specify):				
Note: Carry subtotals over to Part III, page 2 of this form.		Subtotal →	1	0

★ See fee schedule on registration/application.

★★ Contact the specific permit program for this information.
(Contact numbers are provided in the instructions)

Part IV: General Permit Registrations and Requests for Other Authorizations (continued)

<input checked="" type="checkbox"/> General Permits and Other Authorizations	Initial Fees	No. of Permits Applied For	Total Initial Fee	Original + Required Copies
WASTE MANAGEMENT				
<input type="checkbox"/> Addition of Grass Clippings at Registered Leaf Composting Facilities	\$500.00			1 + 0
<input type="checkbox"/> Beneficial Use Determination	★			1 + 0
<input type="checkbox"/> Collection and Storage of Post Consumer Paint	\$0			1 + 0
<input type="checkbox"/> Connecticut Solid Waste Demonstration Project	\$1000.00			1 + 0
Construct and Operate a Commercial Facility for the Management of Recyclable Materials and Certain Solid Wastes (Commercial GP)				
<input type="checkbox"/> Asbestos Containing Materials	\$1,250.00/\$ 625			1 + 0
<input type="checkbox"/> Ash Residue	\$1,250.00/\$ 625			1 + 0
<input type="checkbox"/> Clean Wood: Tier III	\$500.00/\$250			1 + 0
<input type="checkbox"/> Clean Wood: Tier II	\$250.00/\$125			1 + 0
<input type="checkbox"/> Construction and Demolition Waste: Tier III	\$1,250.00/\$625			1 + 0
<input type="checkbox"/> Construction and Demolition Waste: Tier II	\$500.00/\$250			1 + 0
<input type="checkbox"/> Non-RCRA Hazardous Waste/Compatible Solid Wastes	\$1,250.00/\$625			1 + 0
<input type="checkbox"/> Recyclables	\$500.00/\$250			1 + 0
<input type="checkbox"/> Universal Wastes/Compatible Solid Wastes	\$1,250.00/\$625			1 + 0
Contaminated Soil and/or Staging Management (Staging/Transfer)				
<input type="checkbox"/> New Registrations	\$250.00			1 + 0
<input type="checkbox"/> New Approval of Registrations	\$1500.00			1 + 0
<input type="checkbox"/> Renewal of Registrations	\$250.00			1 + 0
<input type="checkbox"/> Renewal of Approval of Registrations	\$750.00			1 + 0
<input type="checkbox"/> Disassembling Used Electronics	\$2000.00			1 + 0
<input type="checkbox"/> Leaf Composting Facility	\$0			1 + 1
<input type="checkbox"/> Municipal Transfer Station	\$800.00			1 + 1
<input type="checkbox"/> One Day Collection of Certain Wastes and Household Hazardous Waste	\$1000.00			1 + 0
<input type="checkbox"/> Sheet Leaf Composting Notification	\$0			★★
Special Waste Authorization				
<input type="checkbox"/> Landfill or RRF Disposal	\$660.00			
<input type="checkbox"/> Asbestos Disposal	\$300.00			1 + 0
<input type="checkbox"/> homeowner	\$0			
<input type="checkbox"/> Storage and Processing of Asphalt Roofing Shingle Waste	\$2500.00			1 + 0
<input type="checkbox"/> Storage and Processing of Scrap Tires for Beneficial Use	\$1250.00			1 + 0
<input type="checkbox"/> Emergency/Temporary Authorization	★★			★★
<input type="checkbox"/> Other, (please specify):				
REMEDIATION				
<input type="checkbox"/> In Situ Groundwater Remediation: Enhance Aerobic Biodegradation	★			1 + 2
<input type="checkbox"/> In Situ Groundwater Remediation: Chemical Oxidation	\$500.00			1 + 0
<input type="checkbox"/> Emergency/Temporary Authorization	★			★★
Note: Carry subtotals over to Part III, page 2 of this form.		Subtotal ➔	0	0

★ See fee schedule on registration/application.

★★ Contact the specific permit program for this information.

(Contact numbers are provided in the instructions)

Affirmative Action, Equal Employment Opportunity and Americans with Disabilities

The Connecticut Department of Energy and Environmental Protection is an Affirmative Action/Equal Opportunity Employer that is committed to complying with the requirements of the Americans with Disabilities Act (ADA). Please contact us at (860) 418-5910 or deep.accommodations@ct.gov if you: have a disability and need a communication aid or service; have limited proficiency in English and may need information in another language; or if you wish to file an ADA or Title VI discrimination complaint.



STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION



2800 BERLIN TURNPIKE, P.O. BOX 317546
NEWINGTON, CONNECTICUT 06131-7546
Phone: (860) 594-2931

October 15, 2019

TO: Zoning Commission
Town of Southbury
501 Main Street South
Southbury, CT 06488

FROM: Kimberly C. Lesay
Transportation Assistant Planning Director
Bureau of Policy and Planning

SUBJECT: Notification of Submittal of Application to the Department of Energy and Environmental Protection (DEEP) for a General Permit for Water Resource Construction Activities

PROJECT: Rehabilitation of Bridge Nos. 01218 and 04180
Interstate 84 Eastbound and Westbound over Housatonic River
Towns of Newtown and Southbury

Enclosed is a copy of our Request for Authorization under the State of Connecticut Department of Energy and Environmental Protection's General Permit for Water Resource Construction Activities. If your agency wishes to comment on the enclosed application, comments must be submitted to the State Department of Energy and Environmental Protection.

Comments should be directed to:

Land and Water Resources Division
Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

If we can provide additional information, please contact Mr. Jason M. Coite at 860-594-3448.

Enclosures

Naomi C. Hodges/nch

cc: DEEP Permit File



STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION



2800 BERLIN TURNPIKE, P.O. BOX 317546
NEWINGTON, CONNECTICUT 06131-7546
Phone: (860) 594-2931

October 15, 2019

TO: Planning Commission
Town of Southbury
501 Main Street South
Southbury, CT 06488

FROM: Kimberly C. Lesay
Transportation Assistant Planning Director
Bureau of Policy and Planning

SUBJECT: Notification of Submittal of Application to the Department of Energy and Environmental Protection (DEEP) for a General Permit for Water Resource Construction Activities

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STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION



2800 BERLIN TURNPIKE, P.O. BOX 317546
NEWINGTON, CONNECTICUT 06131-7546
Phone: (860) 594-2931

October 15, 2019

TO: Inland Wetlands Commission
Town of Southbury
501 Main Street South
Southbury, CT 06488

FROM: Kimberly C. Lesay
Transportation Assistant Planning Director
Bureau of Policy and Planning

SUBJECT: Notification of Submittal of Application to the Department of Energy and Environmental Protection (DEEP) for a General Permit for Water Resource Construction Activities

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STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION



2800 BERLIN TURNPIKE, P.O. BOX 317546
NEWINGTON, CONNECTICUT 06131-7546
Phone: (860) 594-2931

October 15, 2019

TO: Conservation Commission
Town of Southbury
501 Main Street South
Southbury, CT 06488

FROM: Kimberly C. Lesay
Transportation Assistant Planning Director
Bureau of Policy and Planning

SUBJECT: Notification of Submittal of Application to the Department of Energy and Environmental Protection (DEEP) for a General Permit for Water Resource Construction Activities

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Enclosures

Naomi C. Hodges/nch

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STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION



2800 BERLIN TURNPIKE, P.O. BOX 317546
NEWINGTON, CONNECTICUT 06131-7546
Phone: (860) 594-2931

October 15, 2019

TO: Planning & Zoning Commission
Town of Newtown
3 Primrose Street
Newtown, CT 06470

FROM: Kimberly C. Lesay
Transportation Assistant Planning Director
Bureau of Policy and Planning

SUBJECT: Notification of Submittal of Application to the Department of Energy and Environmental Protection (DEEP) for a General Permit for Water Resource Construction Activities

PROJECT: Rehabilitation of Bridge Nos. 01218 and 04180
Interstate 84 Eastbound and Westbound over Housatonic River
Towns of Newtown and Southbury

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Land and Water Resources Division
Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

If we can provide additional information, please contact Mr. Jason M. Coite at 860-594-3448.

Enclosures

Naomi C. Hodges/nch

cc: DEEP Permit File



STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION



2800 BERLIN TURNPIKE, P.O. BOX 317546
NEWINGTON, CONNECTICUT 06131-7546
Phone: (860) 594-2931

October 15, 2019

TO: Inland Wetlands Commission
Town of Newtown
3 Primrose Street
Newtown, CT 06470

FROM: Kimberly C. Lesay
Transportation Assistant Planning Director
Bureau of Policy and Planning

SUBJECT: Notification of Submittal of Application to the Department of Energy and Environmental Protection (DEEP) for a General Permit for Water Resource Construction Activities

PROJECT: Rehabilitation of Bridge Nos. 01218 and 04180
Interstate 84 Eastbound and Westbound over Housatonic River
Towns of Newtown and Southbury

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Comments should be directed to:

Land and Water Resources Division
Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

If we can provide additional information, please contact Mr. Jason M. Coite at 860-594-3448.

Enclosures

Naomi C. Hodges/nch

cc: DEEP Permit File



STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION



2800 BERLIN TURNPIKE, P.O. BOX 317546
NEWINGTON, CONNECTICUT 06131-7546
Phone: (860) 594-2931

October 15, 2019

TO: Conservation Commission
Town of Newtown
3 Primrose Street
Newtown, CT 06470

FROM: Kimberly C. Lesay
Transportation Assistant Planning Director
Bureau of Policy and Planning

SUBJECT: Notification of Submittal of Application to the Department of Energy and Environmental Protection (DEEP) for a General Permit for Water Resource Construction Activities

PROJECT: Rehabilitation of Bridge Nos. 01218 and 04180
Interstate 84 Eastbound and Westbound over Housatonic River
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Department of Energy and Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

If we can provide additional information, please contact Mr. Jason M. Coite at 860-594-3448.

Enclosures

Naomi C. Hodges/nch

cc: DEEP Permit File

bcc: Rabih M. Barakat – Andrew J. Cardinali – Ryan D. Martin
Kimberly C. Lesay – Kevin F. Carifa – Andrew Piraneo
Jason M. Coite – Michael J. Salter
District 4 Construction – John S. Dunham – Richard N. Symonds
Donald P. Wurst – Tracey Brais (CME)



Statewide Inland Wetlands & Watercourses Activity Reporting Form

Please complete and mail this form in accordance with the instructions on pages 2 and 3 to:

DEEP Land & Water Resources Division, Inland Wetlands Management Program, 79 Elm Street, 3rd Floor, Hartford, CT 06106

Incomplete or incomprehensible forms will be mailed back to the inland wetlands agency.

PART I: Must Be Completed By The Inland Wetlands Agency

- DATE ACTION WAS TAKEN: year: _____ month: _____
- ACTION TAKEN (see instructions, only use one code): _____
- WAS A PUBLIC HEARING HELD (check one)? yes no
- NAME OF AGENCY OFFICIAL VERIFYING AND COMPLETING THIS FORM:
(print name) _____ (signature) _____

PART II: To Be Completed By The Inland Wetlands Agency Or The Applicant

- TOWN IN WHICH THE ACTION IS OCCURRING (print name): Newtown
does this project cross municipal boundaries (check one)? yes no
if yes, list the other town(s) in which the action is occurring (print name(s)): Southbury, _____
- LOCATION (see instructions for information): USGS quad name: Southbury or number: 78
subregional drainage basin number: 6000
- NAME OF APPLICANT, VIOLATOR OR PETITIONER (print name): Connecticut Department of Transportation
- NAME & ADDRESS / LOCATION OF PROJECT SITE (print information): Bridge No. 01218 & 04180: I-84 o/Housatonic River
briefly describe the action/project/activity (check and print information): temporary permanent description: Rehabilitation of Bridge Nos. 01218 and 04180: Superstructure replacement with pier and abutment modifications.
- ACTIVITY PURPOSE CODE (see instructions, only use one code): N
- ACTIVITY TYPE CODE(S) (see instructions for codes): 9, 12, 14, _____
- WETLAND / WATERCOURSE AREA ALTERED (must provide acres or linear feet):
wetlands: 0.00 acres open water body: 0.02 acres stream: 72 linear feet
- UPLAND AREA ALTERED (must provide acres): 2 acres
- AREA OF WETLANDS / WATERCOURSES RESTORED, ENHANCED OR CREATED (must provide acres): 0.00 acres

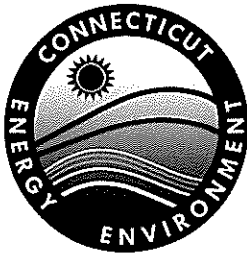
DATE RECEIVED:

PART III: To Be Completed By The DEEP

DATE RETURNED TO DEEP:

FORM COMPLETED: YES NO

FORM CORRECTED / COMPLETED: YES NO



Connecticut Department of
 Energy & Environmental Protection
 Bureau of Water Protection & Land Reuse
 Inland Water Resources Division

Request for Authorization Form for the General Permit for Water Resource Construction Activities

Please complete this form in accordance with the general permit (DEEP-IWRD-GP-013) to ensure the proper handling of your request. Print or type unless otherwise noted. You must submit the fee along with this completed form.

CPPU USE ONLY
App #: _____
Doc #: _____
Check #: _____
Program: GP IWRD Construction Activities

Part I: Request and Fee Type

Check the appropriate box identifying the request type.

<input type="checkbox"/> \$5000 [#1757] for each Request for Authorization for Section 3(a)(1), (a)(2), (a)(3), (a)(4), (a)(5), (a)(6), or (a)(7) activities under the subject general permit, unless you qualify as one of the following: <input type="checkbox"/> \$2500 for any municipality <input type="checkbox"/> \$2500 for electronic filing*	<input checked="" type="checkbox"/> \$2500 [#1758] for each Request for Authorization for Section 3(a)(8) or 3(a)(9) activities under the subject general permit, unless you qualify as one of the following: <input type="checkbox"/> \$1250 for any municipality <input type="checkbox"/> \$1250 for electronic filing*
--	---

**In order to file electronically, ALL supporting documents under Part VI of this application must be submitted in an electronic format on a CD, along with this original completed application in hard copy.*

The request will not be processed without the fee. The fee shall be non-refundable and shall be paid by check or money order to the Department of Energy and Environmental Protection.

Town where site is located: Newtown and Southbury

Brief Description of Project: The project involves the repair of Bridge Nos. 01218 and 04180. Each of the existing two-girder floor system superstructures will be replaced with weathering steel multi-girder superstructures. Finger joints will be installed between the abutments and approach slabs. Pier modifications will also occur. A tempoary work trestle will be constructed between the bridges and within the Housatonic River for bridge construction.

Part II: Requestor Information

- If a requester is a corporation, limited liability company, limited partnership, limited liability partnership, or a statutory trust, it must be registered with the Secretary of State. If applicable, requester's name shall be stated **exactly** as it is registered with the Secretary of State. Please note, for those entities registered with the Secretary of State, the registered name will be the name used by DEEP. This information can be accessed at the Secretary of State's database (CONCORD). (www.concord-sots.ct.gov/CONCORD/index.jsp)
- If a requester is an individual, provide the legal name (include suffix) in the following format: First Name; Middle Initial; Last Name; Suffix (Jr, Sr., II, III, etc.).
- If there are any changes or corrections to your company/facility or individual mailing or billing address or contact information, please complete and submit the [Request to Change Company/Individual Information](#) to the address indicated on the form. If there is a change in name of the entity holding a DEEP license or a change in ownership, contact the Office of Planning and Program Development (OPPD) at 860-424-3003. For any other changes you must contact the specific program from which you hold a current DEEP license.

1. Requester Name: Connecticut Department of Transportation

Mailing Address: 2800 Berlin Turnpike

City/Town: Newington

State: CT Zip Code: 06131

Business Phone: 860-594-2000

ext.:

Contact Person: Kimberly C. Lesay

Phone: 860-594-2931 ext.

E-mail: Kimberly.Lesay@ct.gov

*By providing this e-mail address you are agreeing to receive official correspondence from the department, at this electronic address, concerning the subject request. Please remember to check your security settings to be sure you can receive e-mails from "ct.gov" addresses. Also, please notify the department if your e-mail address changes.

a) Requester Type (check one):

individual federal agency state agency municipality tribal

*business entity (*If a business entity complete i through iii):

i) check type: corporation limited liability company limited partnership
 limited liability partnership statutory trust Other: _____

ii) provide Secretary of the State business ID #: _____ This information can be accessed at database (CONCORD). (www.concord-sots.ct.gov/CONCORD/index.jsp)

iii) Check here if your business is **not** registered with the Secretary of State's office.

Check here if any co-registrants. If so, attach additional sheet(s) with the required information as requested above.

b) Requester's interest in property at which the proposed activity is to be located:

site owner option holder lessee easement holder operator

other (specify): _____

Part II: Requestor Information (continued)

2. Billing contact, if different than the requester.

Name:

Mailing Address:

City/Town:

State:

Zip Code:

Business Phone:

ext.

Contact Person:

Title:

Email:

3. Primary contact for departmental correspondence and inquiries, if different than the requester.

Name:

Mailing Address:

City/Town:

State:

Zip Code:

Business Phone:

ext.

Contact Person:

Title:

Email:

*By providing this e-mail address you are agreeing to receive official correspondence from the department, at this electronic address, concerning the subject request. Please remember to check your security settings to be sure you can receive e-mails from "ct.gov" addresses. Also, please notify the department if your e-mail address changes.

4. Attorney or other representative, if applicable:

Firm Name:

Mailing Address:

City/Town:

State:

Zip Code:

Business Phone:

ext.

Attorney:

Email:

5. Site Owner, if different than the requester.

Name:

Mailing Address:

City/Town:

State:

Zip Code:

Business Phone:

ext.

Contact Person:

Title:

Email:

Part II: Requestor Information (continued)

6. **Engineer(s) or other consultant(s) employed or retained to assist in preparing the request or in designing or constructing the activity.**

Name: **CME Associates**

Mailing Address: **101 East River Drive**

City/Town: **East Hartford**

State: **CT** Zip Code: **06108**

Business Phone: **860-290-4100**

ext. **1148**

Contact Person: **Naomi Hodges**

Title: **Environmental Scientist**

Email: **nhodges@cmeengineering.com**

Service Provided: **Liason Engineering Services, Environmental Services**

Check here if additional sheets are necessary, and label and attach them to this sheet.

Part III: Site Information

1. SITE NAME AND LOCATION

Name of Site : **Bridges No. 01218 and 04180**

Street Address or Location Description: **Bridge No. 01218 (I-84 EB) and Bridge No. 04180 (I-84 WB) over Housatonic River**

City/Town: **Newtown/Southbury**
06482

State: **CT** Zip Code: **06488**

Tax Assessor's Reference: Map

Block

Lot

Latitude and longitude of the exact location of the proposed activity in degrees, minutes, and seconds or in decimal degrees: Latitude: **41.439137/41.468978** Longitude: **-73.247516/-73.247991**

Method of determination (check one):

GPS USGS Map Other (please specify): **Google Aerial Maps**

If a USGS Map was used, provide the quadrangle name:

2. **INDIAN LANDS:** Is or will the facility be located on federally recognized Indian lands? Yes No
3. **COASTAL BOUNDARY:** Is the activity which is the subject of this registration located within the coastal boundary as delineated on DEEP approved coastal boundary maps? Yes No

If yes, and this registration is for a new authorization, or a modification of an existing authorization where the physical footprint of the subject activity is modified, you must submit a [Coastal Consistency Review Form](#) (DEEP-APP-004) with your registration as Attachment C.

Information on the coastal boundary is available at www.cteco.uconn.edu/map_catalog.asp (Select the town and then select coastal boundary. If the town is not within the coastal boundary you will not be able to select the coastal boundary map.) or the local town hall or on the "Coastal Boundary Map" available at DEEP Maps and Publications (860-424-3555).

6. Engineer(s) or other consultant(s) employed or retained to assist in preparing the request or in designing or constructing the activity.

Name: Louis Berger U.S. a WSP Company

Mailing Address: 55 Capital Boulevard

City/Town: Rocky Hill

State: CT

Zip Code: 06067

Business Phone: (860) 920 – 5080

Ext.

Contact Person: Shaun Suehr

Title: Senior Civil Engineer

E-mail: shaun.suehr@wsp.com

Service Provided: Design Permit Plans

Part III: Site Information (continued)

4. **ENDANGERED OR THREATENED SPECIES:** According to the most current "State and Federal Listed Species and Natural Communities Map", is the project site located within an area identified as a habitat for endangered, threatened or special concern species? Yes No Date of Map: **June 2019**

If yes, complete and submit a [Request for NDDB State Listed Species Review Form](#) (DEEP-APP-007) to the address specified on the form. **Please note NDDB review generally takes 4 to 6 weeks and may require additional documentation from the registrant.**

A **copy** of the completed *Request for NDDB State Listed Species Review Form* and the CT NDDB response **must** be submitted with this completed registration as Attachment D.

For more information visit the DEEP website at www.ct.gov/deep/nddbrequest or call the NDDB at 860-424-3011.

5. **AQUIFER PROTECTION AREAS:** Is the site located within a mapped Level A or Level B [Aquifer Protection Area](#), as defined in CGS section 22a-354a through 22a-354bb?

Yes No If **yes**, check one: Level A or Level B

If **Level A**, are any of the [regulated activities](#), as defined in RCSA section 22a-354i-1(34), conducted on this site? Yes No

If **yes**, and your business is **not** already registered with the Aquifer Protection Program, contact the [local aquifer protection agent](#) or DEEP to take appropriate actions.

For more information on the Aquifer Protection Area Program visit the DEEP website at www.ct.gov/deep/aquiferprotection or contact the program at 860-424-3020.

6. **CONSERVATION OR PRESERVATION RESTRICTION:** Is the property subject to a conservation or preservation restriction? Yes No

If Yes, proof of written notice of this registration to the holder of such restriction or a letter from the holder of such restriction verifying that this registration is in compliance with the terms of the restriction, must be submitted as Attachment E.

Part IV: Construction Activity Details

1. Proposed Date of Initiation of Activity: Spring 2020

2. Anticipated Date of Completion: Fall 2023

3. Name of the wetland or watercourse involved with or adjacent to the subject activity:
Housatonic River/Lake Zoar

4. Is the subject activity within a watercourse or floodplain? Yes No

5. Will the subject activity be within a FEMA floodway? Yes No

6. If the project requires a Flood Management Certification for the subject activity, provide the Flood Management Certification Number: FM- General Permit

Part IV: Construction Activity Details (continued)

7. Disturbance to wetlands, watercourses and flood plains:

Wetlands (acres):

excavation: temp= 0.05 fill: perm= 0.04 total disturbance: 0.09

Floodplain (cubic yards):

excavation: 740 fill: 830 net: 90

Watercourse (linear feet): temp & perm= 72 feet

8. Describe the present and intended use(s) of the property at which the subject activity will be conducted and the reason for conducting or maintaining the activity.

The present and intended use of Bridges No. 01218 and 04180 are to carry vehicular traffic on I-84 EB and I-84 WB over the Housatonic River between Newtown and Southbury. Bridge No. 01218 superstructure was rated poor due to primarily section losses noted of the floorbeams. Bridge No. 04180 superstructure was rated fair due to section losses, cracked fillet welds, and warped webs of the floorbeams. The project proposes to demolish the existing superstructure floor system and replace with a weathering steel multi-girder superstructure. A temporary work trestle between the bridges is proposed to conduct the work. The reason for conducting this activity is to address the existing structural problems in order to ensure safe vehicular and boating travel, while minimizing environmental and traffic impacts.

9. Describe all natural and manmade features impacted by the subject activity, including wetlands, watercourses, fish and wildlife habitat, floodplains, and structures and appurtenances thereto, and the impact of the subject activity on such features.

See attached sheets.

Check here if additional sheets are necessary, and label and attach them to this sheet.

Part IV #9 – Describe all natural and manmade features impacted by the subject activity, including wetland, watercourses, fish and wildlife habitat, floodplains, and structures and appurtenances thereto, and the impact of the subject activity on such feature.

Existing Conditions:

Manmade Features: Bridge No. 01218 carries Interstate-84 (I-84) eastbound (EB) traffic, and Bridge No. 04180 carries I-84 westbound (WB) traffic over the Housatonic River between the Towns of Southbury and Newtown. Despite I-84 being logged as an east-west road, it is oriented north-south at the bridge site and the river flows from west to east under both bridges. As a result, Bridge Nos. 01218 and 04180 are logged south to north. Both bridges have an Average Daily Traffic (ADT) of 38,150 vehicles (each direction) per the 2018 traffic data with 10% heavy truck traffic.

Bridge No. 01218 is a 4-span structure with a superstructure consisting of a continuous steel plate girder-stringer-floorbeam system and substructure consisting of two pile-supported reinforced concrete abutments and three pile-supported reinforced concrete wall piers. This structure, also known as the Rochambeau Bridge, was originally built in 1953 for the relocation of US Route 6 and reconstructed in 1979 as part of building of I-84. The bridge carries two lanes of eastbound traffic and a sidewalk outboard of the south parapet. The total structure length is approximately 792 feet. The out-to-out bridge width is 70.09 feet, with a 60-foot curb-to-curb roadway width, a 5-foot exterior sidewalk, and a 1.25-foot wide rail base for protective pedestrian fence. The 60-foot curb-to-curb width includes two travel lanes and two wide shoulders. The recent biennial state inspection (2018) revealed that Bridge No. 01218 superstructure is rated poor (4) due primarily to section losses noted of the floor-beams.

Bridge No. 04180 is also a 4-span structure with a superstructure consisting of a steel girder-stringer-floorsystem. Originally built in 1977 as part of the construction of I-84, the superstructure is supported by reinforced concrete abutments and piers that are founded on piles. The overall length of the structure is 792 feet with an out-to-out bridge width of 63.8 feet and curb to curb width of 60 feet. The 60-foot curb-to-curb width includes two travel lanes, the end of an on-ramp acceleration lane and two wide shoulders. The recent biennial state inspection (2018) revealed that Bridge No. 04180 superstructure is rated fair (5) due to section losses in superstructure steel primary members, cracked fillet welds, and warped webs on several of the floorbeams. The bridges will be rehabilitated under State Project No. 96-201.

Natural Features: The Housatonic River is non-tidal and flows approximately from the west to the east. It is currently used solely for recreational boating and fishing. At this location, the Housatonic River has a drainage area of 1,510 square miles. Approximately 600 feet west of the project bridges, the Pomperaug River flows into the Housatonic River. Upstream of the project bridges, approximately 2.5 miles west of the project bridges, is the hydroelectric Shepaug Dam. Downstream from the project bridges, approximately 5.5 miles southeast of the project bridges, is the Stevenson Dam. This impoundment of the Housatonic River creates Lake Zoar. As a result of the floodway control, the bridges are considered hydraulically adequate. According to the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map number 09009C0228H and 09001C0180F (effective dates December 17, 2010 and June 18, 2010 respectively), the area of the crossing is located in Zone AE, a Special Hazard Area. The FEMA 100-year base flood elevation upstream and downstream of the crossings is approximately 108 feet (NAVD88). Wetlands have been delineated and are provided on the project plans. The limit of wetland is adjacent to the ordinary high water elevation. The embankments on both sides of the river are generally well vegetated, except under the bridges, and previously placed riprap slope protection can be found on the embankments in

front of all bridge abutments. Vegetation includes dense brush dominated by Multiflora Rose (*Rosa multiflora*). Additional species present include Morrow's Honeysuckle (*Lonicera morrowii*), and Asiatic Bittersweet (*Celastrus orbiculatus*).

Proposed Activities:

Subject Activity: The project proposes to repair the existing bridge structures. The girder-stringer-floor system superstructure will be replaced on both bridges. The new superstructure will consist of multiple weathering steel welded plate girders with a reinforced concrete deck that is topped with 3 inches of bituminous concrete. Longer pier caps on top of the existing pier walls will be constructed to accommodate the new girder configuration and substructure repairs above the ordinary high water elevation are proposed. Channel excavation around Bridge No. 04180 Pier 3 will be needed to construct a concrete collar at the bottom of the pier stem and natural streambed material will be used to backfill the excavated area once the collar is built. The natural streambed material will backfilled to match the existing channel bottom. The abutment seats will be modified to support the new girder configuration. New finger joints and approach slabs will be installed behind the bridge abutments. A sidewalk will be constructed along with pedestrian fencing along the east fascia of Bridge No. 01218 to match the existing bridge. The proposed vertical profiles are slightly different from the existing conditions in order to meet design criteria for a design speed of 75 mph. At the end of construction, two 12-foot wide travel lanes will be striped on each bound.

The project also includes drainage modifications. Roadway drainage runoff on the bridges will continue to directly discharge into the Housatonic River through new scuppers in the bridge deck. A water quality swale in the median on the south side of the river is proposed to treat the stormwater collected from the south approach roadways prior to discharging to a proposed outfall located along the southern embankment. Stormwater collected on the northern approaches to the bridges will discharged to a new outfall located within the existing grassed median. The median will be modified to function as a water quality basin. Subsequently the stormwater flow will discharge to an existing outfall along the northeastern slope of I-84.

The proposed rehabilitation of the bridges will not have any adverse impacts as compared to existing conditions. Bridge Nos. 01218 and 04180 are hydraulically adequate and are low risk for scour. This is based on their historical performance as well as their location within a watercourse impounded by two dams generating hydroelectric power, which are regulated by the Federal Energy Regulatory Commission (FERC). Historically, per inspection reports over the last 50 years, scour has never exposed the piles under the bridge piers or abutments. The riverbanks are well vegetated and there is no evidence of lateral instability. The low chord profile will be slightly higher than the existing low chord elevations, which are above the FEMA floodplain limits.

Construction Access: For access during demolition and reconstruction of the superstructure, temporary work trestles between the bridges on both sides of the river are proposed. The temporary work trestles will each be approximately 70 feet wide and pile-supported with an approximate pile spacing of 18 to 20 feet. The work trestles will be contractor designed and the contract documents specify that the low chord elevation must be above the First Light project boundary elevation of 107.3 feet (NAVD88) and above the 100-year floodplain elevation of 108 feet (NAVD88). The contract documents specify that all piles installed for temporary construction access structures are to be removed before the completion of construction. If the contractor cannot remove a pile, the pile shall be cut minimum two feet below mudline. Construction of haul roads in the bridge approach median is proposed for transport of materials and equipment from I-

84 to the work trestles. The haul roads are to be constructed so that they do not encroach on any wetlands, the 100-year floodplain elevation, and the Housatonic River.

Barges will be used to facilitate the superstructure demolition and construction in areas where the water depth is greater than 6 feet. Large barges, approximately 100 feet by 54 feet, will be used to support cranes and other equipment, which will be used to construct the work trestles, remove the existing girder-floorbeam sections and place new girder sections. Smaller barges, approximately 30 feet by 12 feet, will be used to store materials and provide access to the piers for substructure repairs and pier cap work. Work platforms that are attached to the piers and floating docks are also proposed for access to the work trestle and other construction activities.

Construction Sequencing: Construction is anticipated to begin in early 2020 and conclude in fall 2023. The construction will be conducted over the course of 4 construction seasons, with work occurring on Bridge No. 04180 the first 2 construction seasons and Bridge No. 01218 the last 2 construction seasons. Construction will occur in 5 main stages that are defined by the maintenance and protection of I-84 traffic plans. Repair work on Bridge No. 04180 will be performed during Stage 2 within nine substages 2A-2I. Repair work on Bridge No. 01218 will be performed in Stage 4 within nine substages 4A-4I. The suggested construction sequence is as follows:

Stage 1 involves the installation of the sedimentation control system, and construction of the haul roads in the approaches and the temporary work trestles. Construction will also occur in the I-84 median to prepare for the traffic crossover. Signs and channel markers will be placed in the river to notify boaters of the 75 foot minimum channel within Span 2 that will be open to boaters during construction.

Stage 2 involves the repair work on Bridge No. 04180. The bridge will be closed to traffic and I-84 WB traffic will crossover to the EB side and Bridge No. 01218. Before starting demolition, a debris shield/containment system will be placed along the underside of Bridge No. 04180. The proposed containment system/debris shield will be installed at approximately the same elevation as the existing girder bottom flanges (estimated EL.127 NAVD88) to ensure that no materials fall from the bridge into the regulated areas during the superstructure replacement operations. A cofferdam will be installed around Pier 3 so that excavation can occur to expose the footing and build the collar. The top of cofferdam elevation of 101 feet was determined based on the temporary water surface elevation for a 2-year storm. Stages 2A through 2D involve the removal of the existing bridge deck and girder-stringer-floorsystem. Stages 2E through 2I involve the construction of the new pier caps and Pier 3 collar, modification of the abutments, erection of the new steel girders, and forming/pouring of the concrete deck. During Stage 2, it is anticipated that the designated channel for boaters will need to be closed for a total of 6 days. Full navigation channel closures shall not occur during weekends from May 1 st to October 1 st during construction. Natural stream bed material will be used at Pier 3 to fill the excavated area back to the approximate existing mudline. At the end of Stage 2, the cofferdam sheeting will be cut a minimum one foot below mudline.

Stage 3 involves work in the I-84 median to prepare for the crossover of I-84 EB traffic to the I-WB side during Stage 4.

Stage 4 involves the repair work on Bridge No. 01218. The bridge will be closed to traffic and I-84 EB traffic will crossover to the WB side, using Bridge No. 04180 to cross the river. Before starting demolition, a debris shield/containment system will be placed along the underside of Bridge No. 01218. Stages 4A through 4D involve the removal of the existing bridge deck and girder-stringer-floorsystem. Stages 4E through 4I involve the construction of the new pier caps and abutment modifications, erection of the new steel girders, and forming/pouring of the concrete deck. During Stage 4, it is anticipated that the designated channel for boaters will need to be closed for a total of 6 days. Full navigation channel closures shall not occur during weekends from May 1 st to October 1 st during construction.

Stage 5 involves removal of the crossover road, haul road, temporary trestles, and temporary channel markers and signs. Any temporary piles that cannot be removed shall be cut a minimum one foot below the mudline during this stage. The I-84 median will be restored and new turf and wildflower establishment will occur in all temporarily disturbed areas. These areas are located on the attached plans. The sedimentation control system will be removed after permanent stabilization.

Best Management Practices: Project disturbance is minimized by the installation of sedimentation and erosion control barriers. The sedimentation and erosion controls shall be installed prior to the start of construction and shall be removed upon permanent stabilization. This project utilizes best management practices (Form 817), 2002 Erosion and Sedimentation Control Guidelines, and 2004 Stormwater Quality Manual. A debris shield will be installed prior to superstructure demolition to prevent construction debris from entering the Housatonic River.

Proposed Impacts: The proposed project results in 0 square feet (0 acres) of permanent and temporary wetland impacts. The clearing of the highway median for the temporary haul roads is outside of the wetland regulatory limits. The project results in 1,800 square feet (0.04 acres) of permanent watercourse impacts. This is a result of the construction of the concrete pier collar at Bridge No. 04180's Pier 3. This number also includes all of the proposed trestle piles. The purpose of quantifying the trestle piles as permanent impact despite being intended to be removed, is to allow the contractor flexibility if any of the piles cannot be removed and must remain. The project results in 2,000 square feet (0.05 acres) of temporary watercourse impacts. This number accounts for the construction of the temporary work trestle and use of a cofferdam for pier collar construction. The total wetland and watercourse impacts is 3,800 square feet (0.09 acres). Impacts are described within the table below:

Bridge No. 01218 and 04180 Wetland and Watercourse Impact Table			
	Wetland	Watercourse	Total
Temporary	0 sqft (0 ac)	1,800 sqft (0.04 ac)	1,800 sqft (0.04 ac)
Permanent	0 sqft (0 ac)	2,000sqft (0.05 ac)	2,000 sqft (0.05 ac)
Total	0 sqft (0 ac)	3,800 sqft (0.09 ac)	3,800 sqft (0.09 ac)

Part V: Supporting Documents

Check the applicable box below for each attachment being submitted with this request. 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 requester's name as indicated on this request. ***In order to file electronically, ALL supporting documents must be submitted in an electronic format on a CD with this original completed application in hard copy.***

- Attachment A: Location Map: A depiction, on an 8.5" x 11" copy of the relevant portion of the most recent version of the United States Geologic Survey topographic map (Scale 1:24,000), of the exact location of the property at which such activity will be conducted.
- Attachment B: Site plan pursuant Section 4(c) (2) (l) of the subject general permit.
- Attachment C: [Coastal Consistency Review Form](#) (DEEP-APP-004), if applicable.
- Attachment D: Copy of the completed *Request for NDDB State Listed Species Review Form* (DEEP-APP-007) and the NDDB response, if applicable.
- Attachment E: Conservation or Preservation Restriction Information, if applicable.
- Attachment F: A copy of the Category 2 approval letter from the Army Corps of Engineers, or a copy of the Appendix 1A: Category 1 Certification Form filed with the US Army Corps of Engineers, if applicable.
- Attachment G: Drainage Maintenance Plan, Trail Maintenance Plan, Boat Launch Maintenance Plan, or Beach Maintenance Plan for Inland Beaches as defined in Section 2 of the subject general permit, if applicable.
- Attachment H: Other information provided by requester (list): **Project Photos, Interagency Notes, FM General Certification, and CTDEEP Fisheries Approval**

Part VI: Requester Certification

The requester *and* the individual(s) responsible for actually preparing the request must sign this part. A request will be considered incomplete unless all required signatures are provided. If the requester is the preparer, please mark N/A in the spaces provided for the preparer.

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief.

I certify that this general permit request for authorization is on complete and accurate forms as prescribed by the commissioner without alteration of the text.

I understand that the subject activity is authorized only on or after the date the commissioner issues a written approval of registration with respect to such activity.

I certify that a complete copy of this request for authorization, including all documents attached thereto, was sent by regular or certified mail or was hand delivered to the municipal wetlands agency, zoning commission, planning commission or combined planning and zoning commission, and conservation commission of each municipality which is or may be affected by the subject activity.

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."



 Signature of Requester

10-16-2019

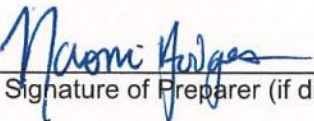
 Date

Thomas J. Maziarz

 Name of Requester (print or type)

Bureau Chief, Policy & Planning

 Title (if applicable)



 Signature of Preparer (if different than above)

09/30/2019

 Date

Naomi Hodges

 Name of Preparer (print or type)

Environmental Scientist

 Title (if applicable)

Check here if additional signatures are required. If so, please reproduce this sheet and attach signed copies to this sheet. You must include signatures of any person preparing any report or parts thereof required in this registration (i.e., professional engineers, surveyors, soil scientists, consultants, etc.)

Note: Please submit this completed Request for Authorization, Fee, and all Supporting Documents to:

CENTRAL PERMIT PROCESSING UNIT
 DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
 79 ELM STREET
 HARTFORD, CT 06106-5127

You must submit a complete copy of this completed request for authorization, including supporting documents, to the municipal wetlands agency, zoning commission, planning commission or combined planning and zoning commission, and conservation commission of each municipality which is or may be affected by the subject activity.

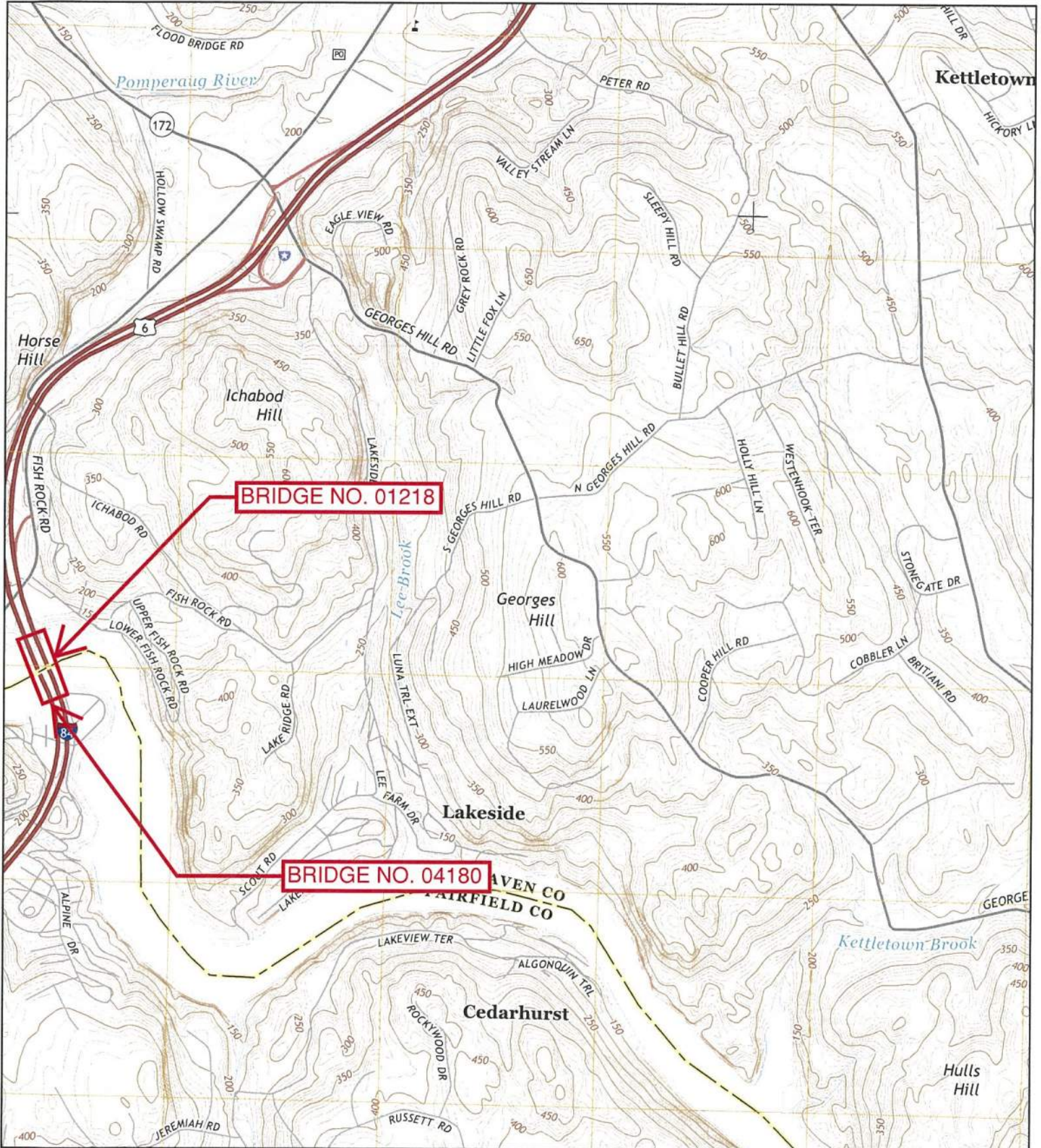
Attachment A: Location Map



Engineers
Designers
Consultants
Planners
Scientists

USGS QUADRANGLE MAP

BRIDGE NOS. 01218 & 04180 NEWTOWN/SOUTHBURY I-84 EASTBOUND AND WESTBOUND OVER HOUSATONIC RIVER



USGS QUAD
SOUTHBURY,
CONNECTICUT

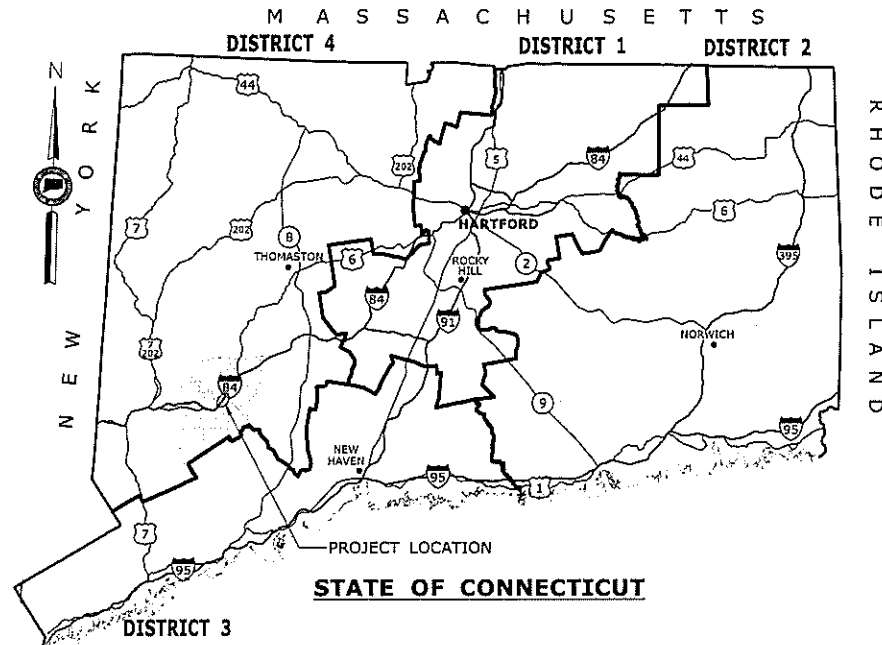
REQUESTER: CONNDOT
DATE: 2015

1 INCH = 2,000 FEET



Attachment B: Site Plans

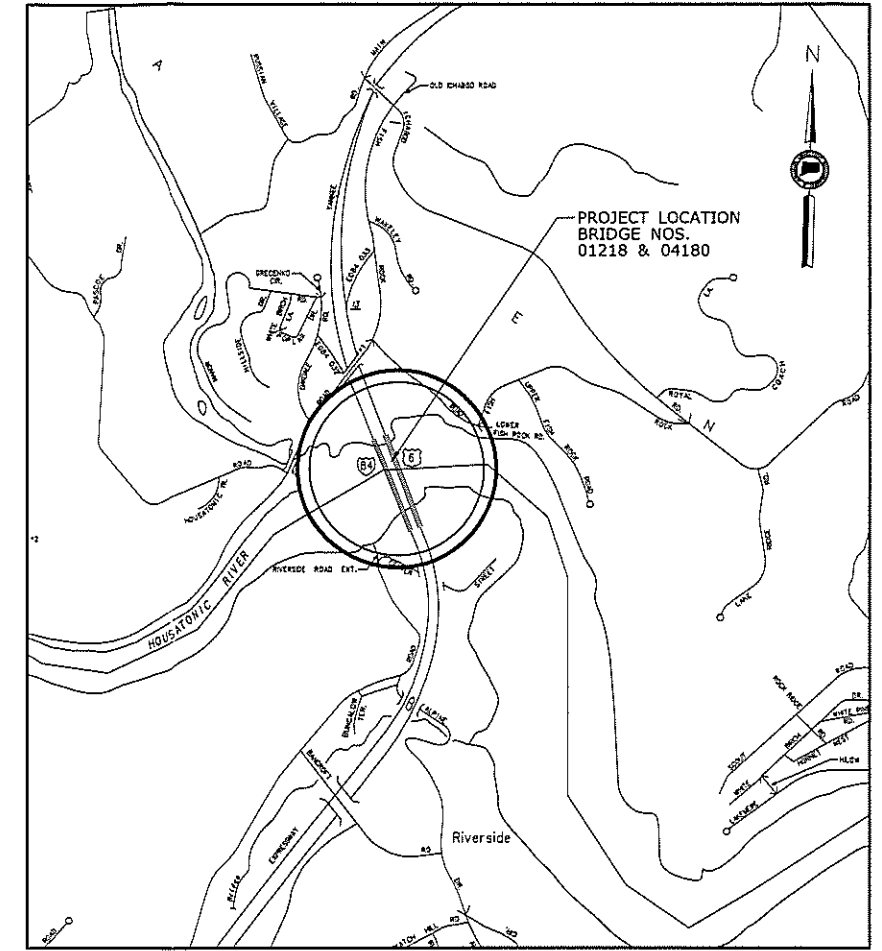
ENVIRONMENTAL PERMIT PLANS STATE PROJECT NO. 0096-0201 REHABILITATION OF BRIDGE NOS. 01218 AND 04180 IN THE TOWNS OF NEWTOWN AND SOUTHBURY



GENERAL NOTES:

1. THESE PLANS 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 DEPARTMENT OF TRANSPORTATION 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 NAD 1927 VERTICAL DATUM BASED ON NAVD 1988.
5. ALL CONSTRUCTION ACTIVITIES WILL BE CONDUCTED IN ACCORDANCE WITH THE DEPARTMENT'S STANDARD SPECIFICATIONS FOR ROADS, BRIDGE AND INCIDENTAL CONSTRUCTION, FORM 817, SECTION 1.10 AND WILL ALSO FOLLOW REQUIRED BEST MANAGEMENT PRACTICES (BMPs) AND SEDIMENT AND EROSION CONTROL MEASURES IN ACCORDANCE WITH THE 2002 EROSION & SEDIMENTATION CONTROL GUIDELINES AND THE 2004 STORMWATER QUALITY MANUAL.

DRAWING NUMBER	DRAWING TITLE
PMT-01	INDEX OF DRAWINGS
PMT-02	GENERAL SITE PLAN
PMT-03	GENERAL SITE PLAN BRIDGE NO. 04180 AND 01218
PMT-04	WETLAND / WATERCOURSE IMPACT PLAN
PMT-05	100 YEAR FLOOD IMPACT PLAN
PMT-06	I-84 WB PIER 3 CUT / FILL LIMITS
PMT-07	CONSTRUCTION STAGING - 1
PMT-08	CONSTRUCTION STAGING - 2
PMT-09	CONSTRUCTION STAGING - 3
PMT-10	CONSTRUCTION STAGING - 4 AND 5
PMT-11	TEMPORARY TRESTLE DETAILS 1
PMT-12	TEMPORARY TRESTLE DETAILS 2
PMT-13	TEMPORARY NAVIGATION LIGHTING / BOAT SAFETY PLAN



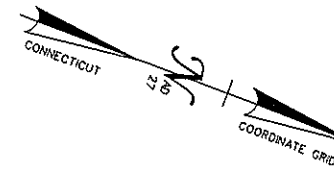
LOCATION PLAN
1"=300'

DESIGNED BY:
LOUIS BERGER US
A WSP COMPANY
55 CAPITAL BOULEVARD
ROCKY HILL, CT 06067

Shaun Suehr
2019.09.27
14:14:38-04'00"

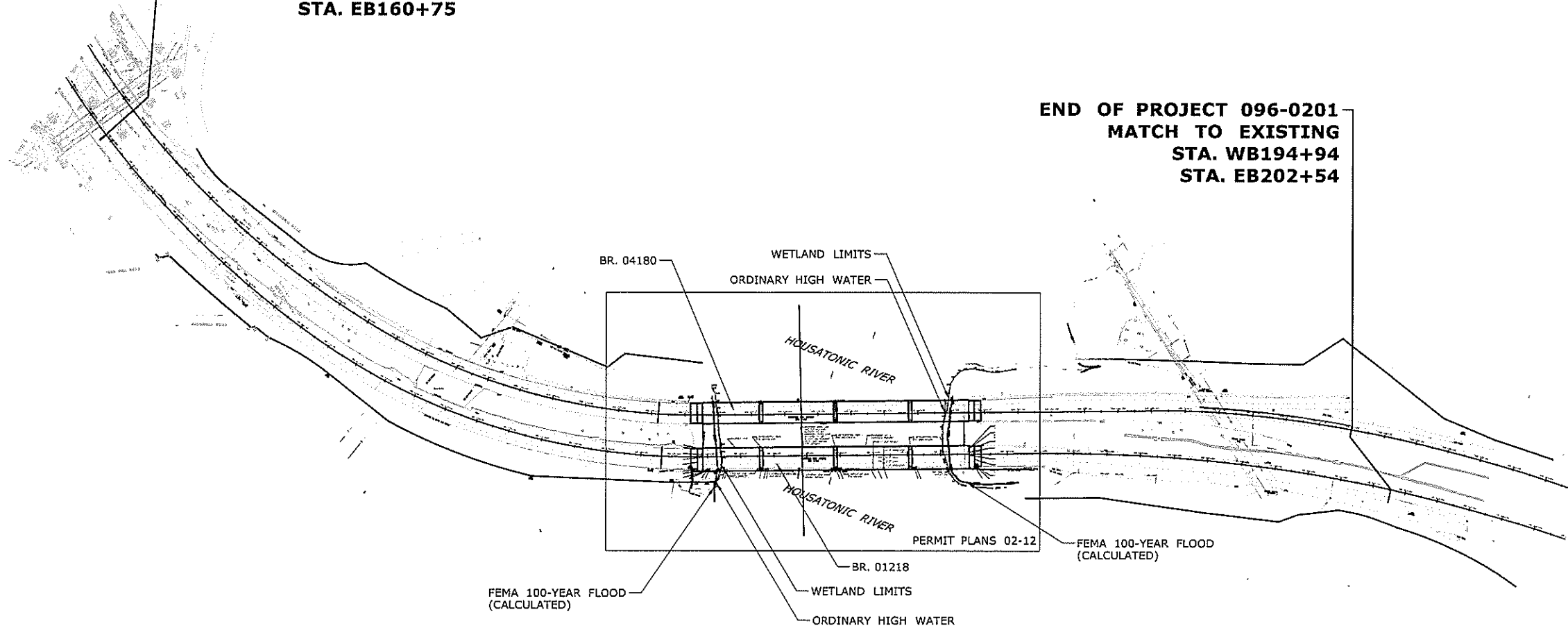
ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 9/24/2019

REV. DATE REVISION DESCRIPTION SHEET NO.	DESIGNER/DRAFTER: AJM CHECKED BY: JPM SCALE AS NOTED	 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION	 LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067	REHABILITATION OF BRIDGE NOS. 01218 AND 04180 I-84 OVER HOUSATONIC RIVER	TOWN: NEWTOWN/SOUTHBURY	PROJECT NO. 0096-0201 DRAWING NO. PMT-01 SHEET NO.
FILENAME: ...HW_HSH_0096_0201_TSH.dgn	Pbitted Date: 9/24/2019					



**BEGIN PROJECT 096-0201
MATCH TO EXISTING
STA. WB155+85
STA. EB160+75**

**END OF PROJECT 096-0201
MATCH TO EXISTING
STA. WB194+94
STA. EB202+54**



LEGEND:

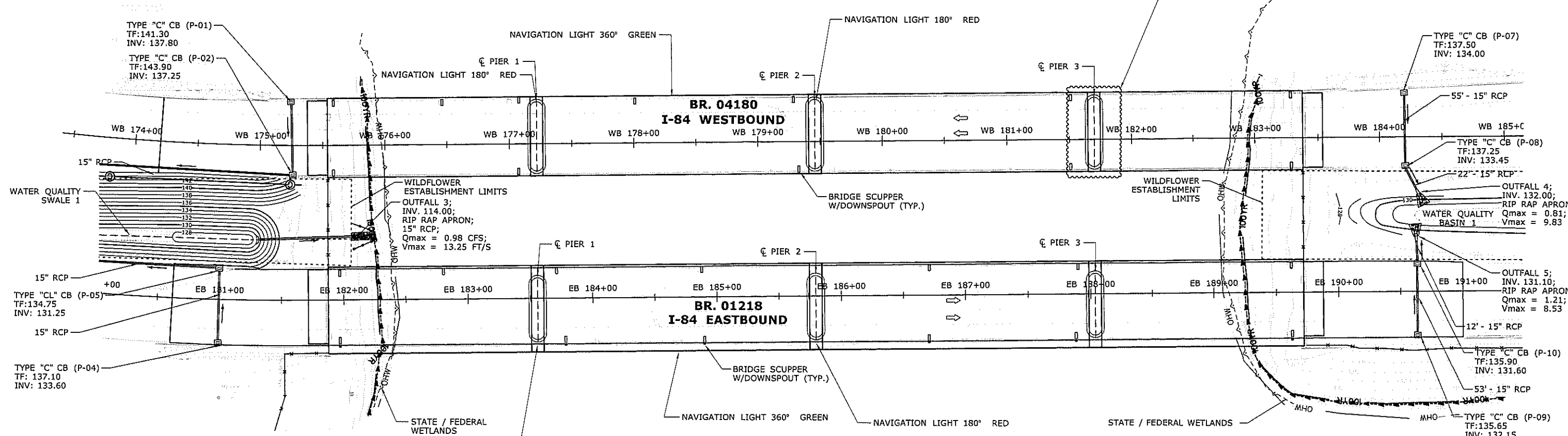
- FEMA 100-YEAR FLOOD (CALCULATED)
- ORDINARY HIGH WATER
- STATE/FEDERAL WETLANDS

ENVIRONMENTAL PERMIT PLANS

PLAN DATE: 9/24/2019

<p>THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.</p>			<p>DESIGNER/DRAFTER: AJM</p> <p>CHECKED BY: JPM</p> <p>SCALE IN FEET 0 200 400 SCALE 1"=200'</p>	<p>STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION</p> <p>Signature Block: LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06867</p>	<p>PROJECT TITLE: REHABILITATION OF BRIDGE NOS 01218 & 04180- I-84 EB/WB OVER HOUSATONIC RIVER</p>	<p>TOWN: NEWTOWN/SOUTHBURY</p> <p>DRAWING TITLE: GENERAL SITE PLAN</p>	<p>PROJECT NO. 96-201</p> <p>DRAWING NO. PMT-02</p> <p>SHEET NO.</p>
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 9/24/2019			Filename: ...SB_HSTL_096_0201_PMT-02.dgn

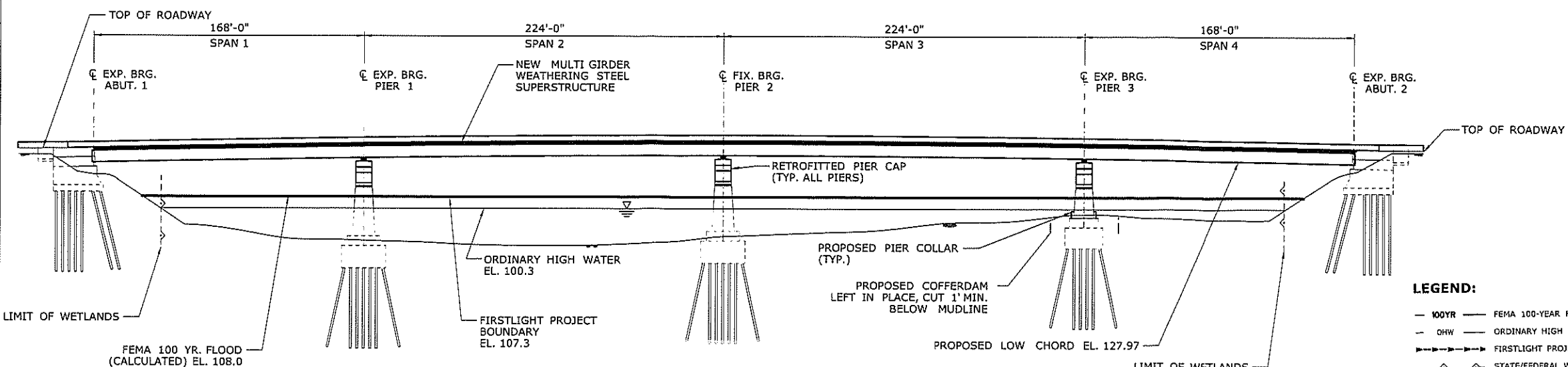
HOUSATONIC RIVER



PLAN
SCALE: 1" = 40'

HYDRAULIC DATA	
DRAINAGE AREA (SQ MI)	1,510
DESIGN FREQUENCY (YRS)	100
DESIGN DISCHARGE (CFS)	126,000
AVERAGE DAILY FLOW ELEV (FT)	100
UPSTREAM DESIGN WATER SURFACE ELEV (FT)	108
DOWNSTREAM DESIGN WATER SURFACE ELEV (FT)	108
MAXIMUM SCOUR ELEV (FT)	42
FREQUENCY (YR)	500
DISCHARGE (CFS)	196,000
WORST CASE SCOUR SUB-STRUCTURE UNIT	PIER 1

NOTE: ELEVATIONS PROVIDED ARE REFERENCED TO NAVD88 DATUM.
¹FAIRFIELD COUNTY FLOOD INSURANCE STUDY, OCT. 16, 2013.
²NORMAL POOL ELEVATION (PROJ. NO. 96-1115 AS-BUILT PLANS)
³ESTIMATED FROM LEVEL 1 SCOUR ANALYSIS REPORT, DATED SEPT. 21, 2018.

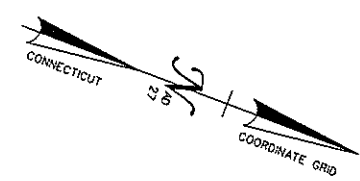


ELEVATION
SCALE: 1" = 40'

- LEGEND:**
- 100YR — FEMA 100-YEAR FLOOD (CALCULATED)
 - - - OHW — ORDINARY HIGH WATER
 - FIRSTLIGHT PROJECT BOUNDARY
 - - - STATE/FEDERAL WETLANDS
 - SEDIMENTATION CONTROL SYSTEM (SCS)

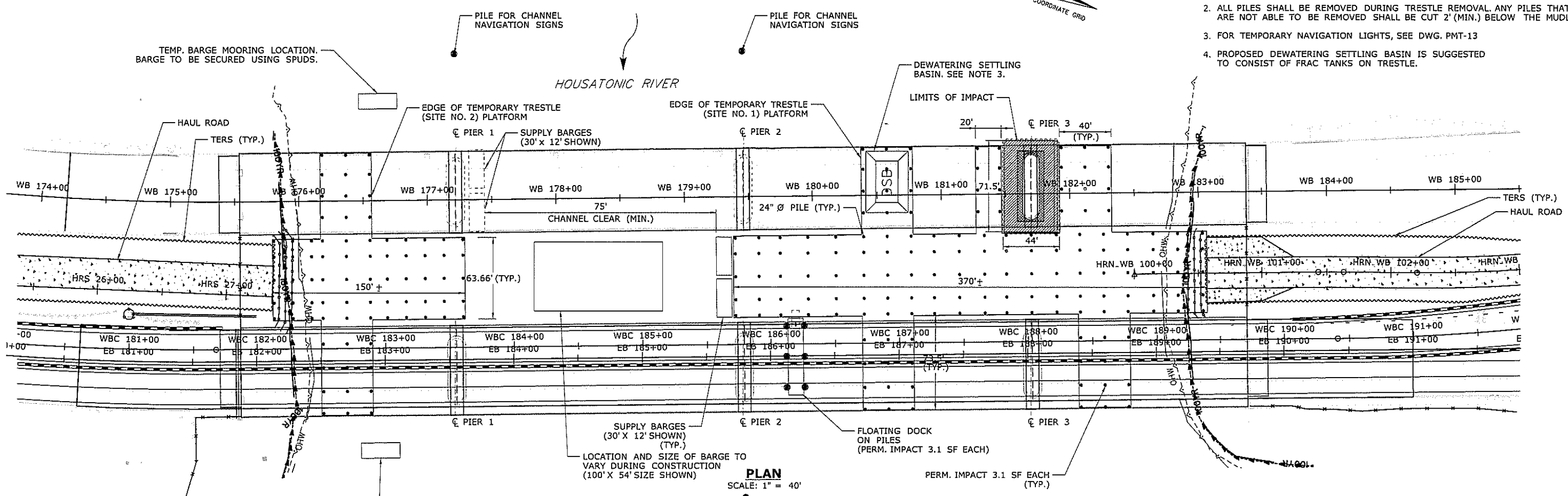
ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 9/24/2019

<p>DESIGNER/DRAFTER: AJM</p> <p>CHECKED BY: JPM</p> <p>SCALE AS NOTED</p>	<p>STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION</p>	<p>SIGNATURE/BLOCK: </p> <p>LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067</p>	<p>PROJECT TITLE: REHABILITATION OF BRIDGE NOS 01218 & 04180- I-84 EB/WB OVER HOUSATONIC RIVER</p>	<p>TOWN: NEWTOWN/SOUTHBURY</p> <p>PROJECT NO.: 96-201</p> <p>DRAWING TITLE: GENERAL SITE PLAN</p> <p>DRAWING NO.: PMT-03</p> <p>SHEET NO.:</p>
<p>THE INFORMATION INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.</p>		<p>Plotted Date: 9/24/2019</p>		<p>File name: ...LSB_MSTL_0096_0201_PMT-03.dgn</p>

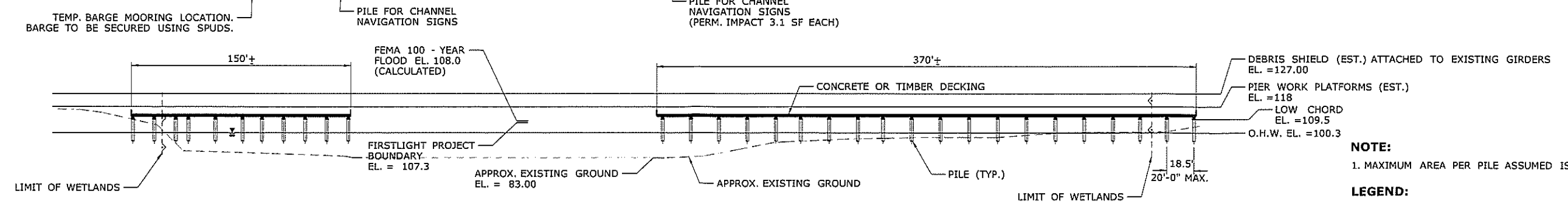


NOTES:

1. THE CONTRACTOR SHALL NOT WORK WITHIN THE LIMITS OF THE WETLANDS AND WATERCOURSE WITH THE EXCEPTION OF THOSE AREAS DELINEATED AS TEMPORARY OR PERMANENT IMPACTS TO THE WETLANDS AND WATERCOURSE. ALL DISTURBED AREAS SHALL BE RESTORED TO PRECONSTRUCTION CONDITION.
2. ALL PILES SHALL BE REMOVED DURING TRESTLE REMOVAL. ANY PILES THAT ARE NOT ABLE TO BE REMOVED SHALL BE CUT 2' (MIN.) BELOW THE MUDLINE.
3. FOR TEMPORARY NAVIGATION LIGHTS, SEE DWG. PMT-13
4. PROPOSED DEWATERING SETTLING BASIN IS SUGGESTED TO CONSIST OF FRAC TANKS ON TRESTLE.



PLAN
SCALE: 1" = 40'



ELEVATION
SCALE: 1" = 40'

NOTE:

1. MAXIMUM AREA PER PILE ASSUMED IS 3.1 SF.

LEGEND:

- TEMPORARY IMPACT
- PERMANENT IMPACT
- 100YR — FEMA 100-YEAR FLOOD (CALCULATED)
- OHW — ORDINARY HIGH WATER
- FIRSTLIGHT PROJECT BOUNDARY
- STATE/FEDERAL WETLANDS
- SEDIMENTATION CONTROL SYSTEM (SCS)
- TEMPORARY EARTH RETAINING SYSTEM (TERS)

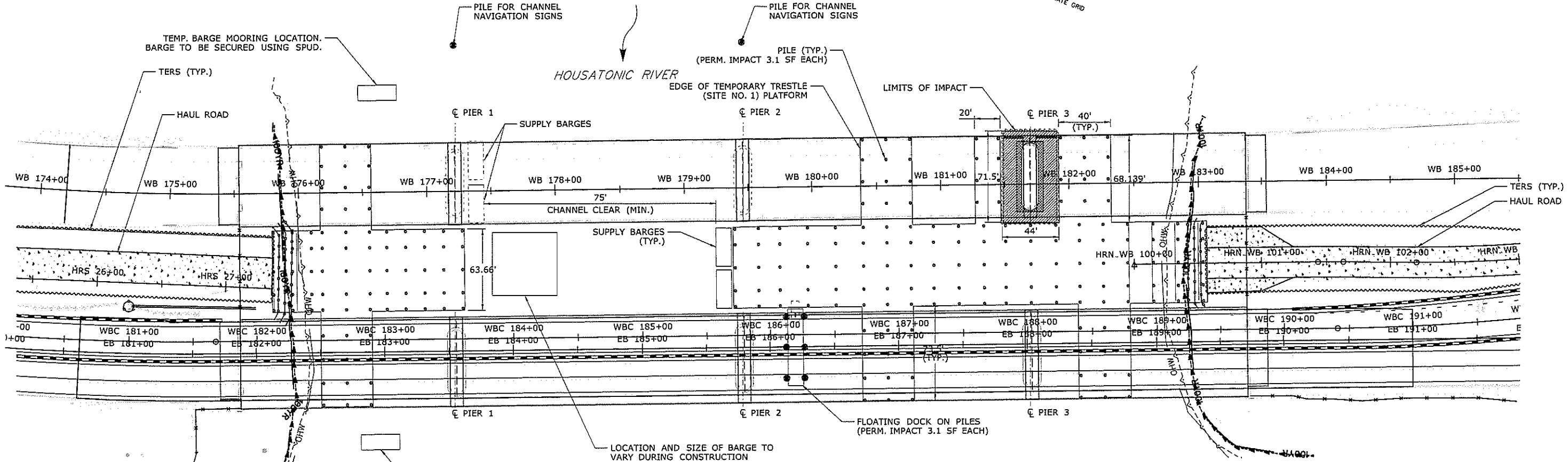
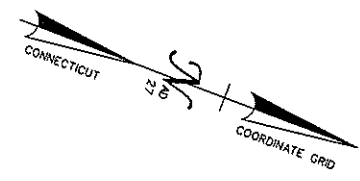
WETLAND IMPACT TABLE			
	WETLAND IMPACTS SF (ACRES)	WATERWAY IMPACTS SF (ACRES)	TOTAL SF (ACRES)
PERMANENT IMPACTS	0 SF (0.00)	1800 SF (0.04)	1800 SF (0.04)
TEMPORARY IMPACTS	0 SF (0.00)	2000 SF (0.05)	2000 SF (0.05)
TOTAL IMPACTS	0 SF (0.00)	3800 SF (0.09)	3800 SF (0.09)

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 9/24/2019

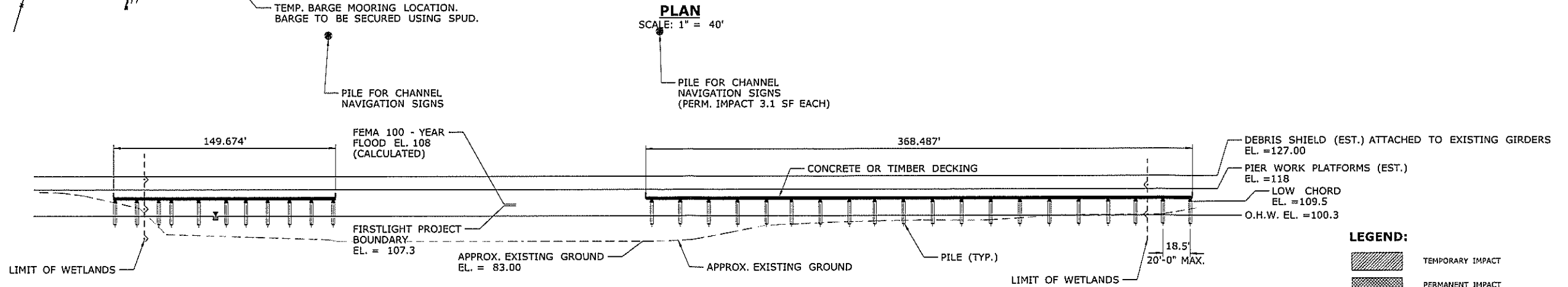
THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.	DESIGNER/DRAFTER: AJM CHECKED BY: JPM SCALE AS NOTED	<p>STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION</p>	<p>LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067</p>	PROJECT TITLE: REHABILITATION OF BRIDGE NOS 01218 & 04180- I-84 EB/WB OVER HOUSATONIC RIVER	TOWN: NEWTOWN/SOUTHBURY PROJECT NO. 96-201 DRAWING NO. PMT-04 SHEET NO.
REV. DATE REVISION DESCRIPTION SHEET NO. Plotted Date: 9/27/2019		Filename: ...15B MSTL 0096 0201 PMT-04.dgn			

NOTE:

THE CONTRACTOR SHALL NOT WORK WITHIN THE LIMITS OF THE WETLANDS AND WATERCOURSE WITH THE EXCEPTION OF THOSE AREAS DELINEATED AS TEMPORARY OR PERMANENT IMPACTS TO THE WETLANDS AND WATERCOURSE. ALL DISTURBED AREAS SHALL BE RESTORED TO PRECONSTRUCTION CONDITION.



PLAN
SCALE: 1" = 40'



ELEVATION
SCALE: 1" = 40'



- LEGEND:**
- TEMPORARY IMPACT
 - PERMANENT IMPACT
 - 100YR - FEMA 100-YEAR FLOOD (CALCULATED)
 - OHW - ORDINARY HIGH WATER
 - FIRSTLIGHT PROJECT BOUNDARY
 - STATE/FEDERAL WETLANDS
 - SEDIMENTATION CONTROL SYSTEM (SCS)
 - TEMPORARY EARTH RETAINING SYSTEM (TERS)

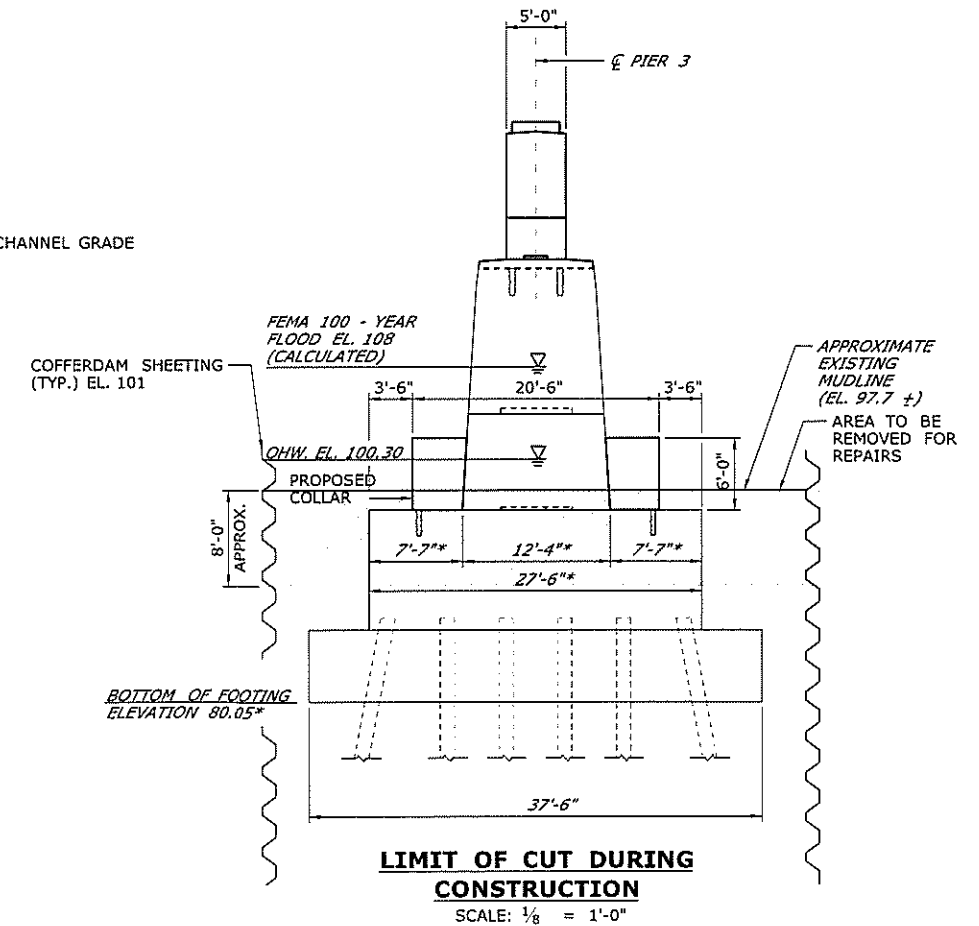
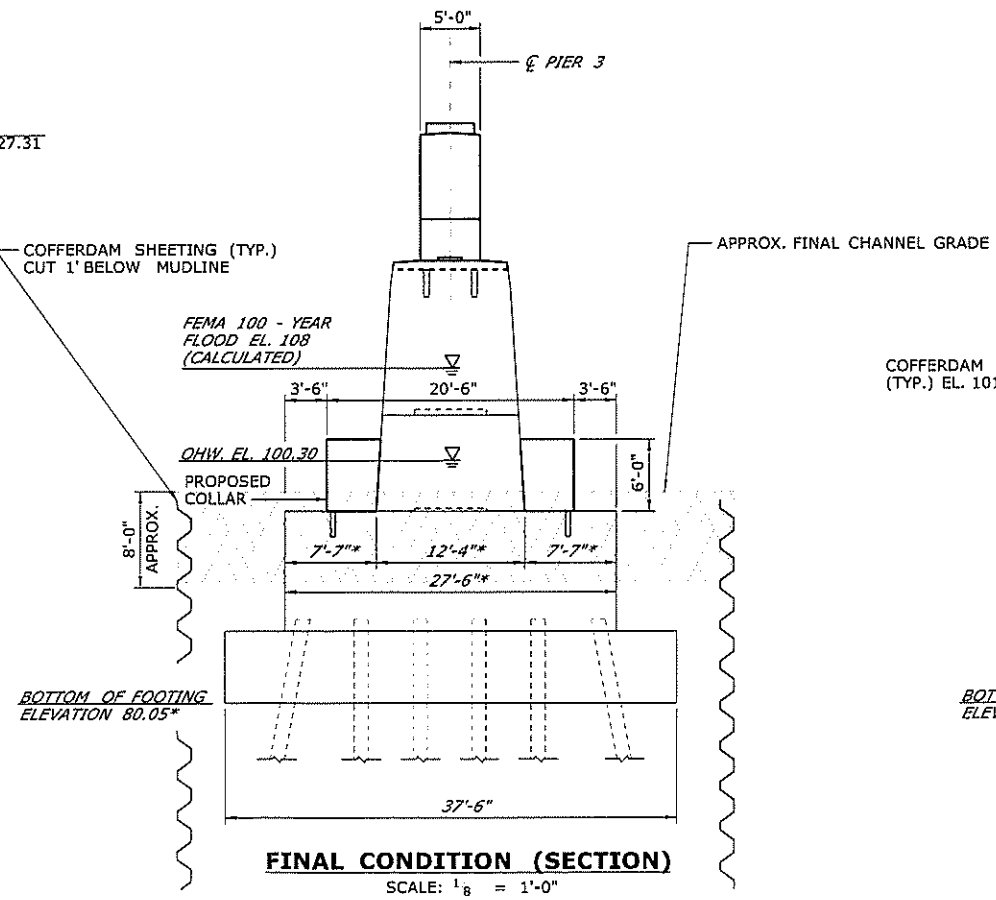
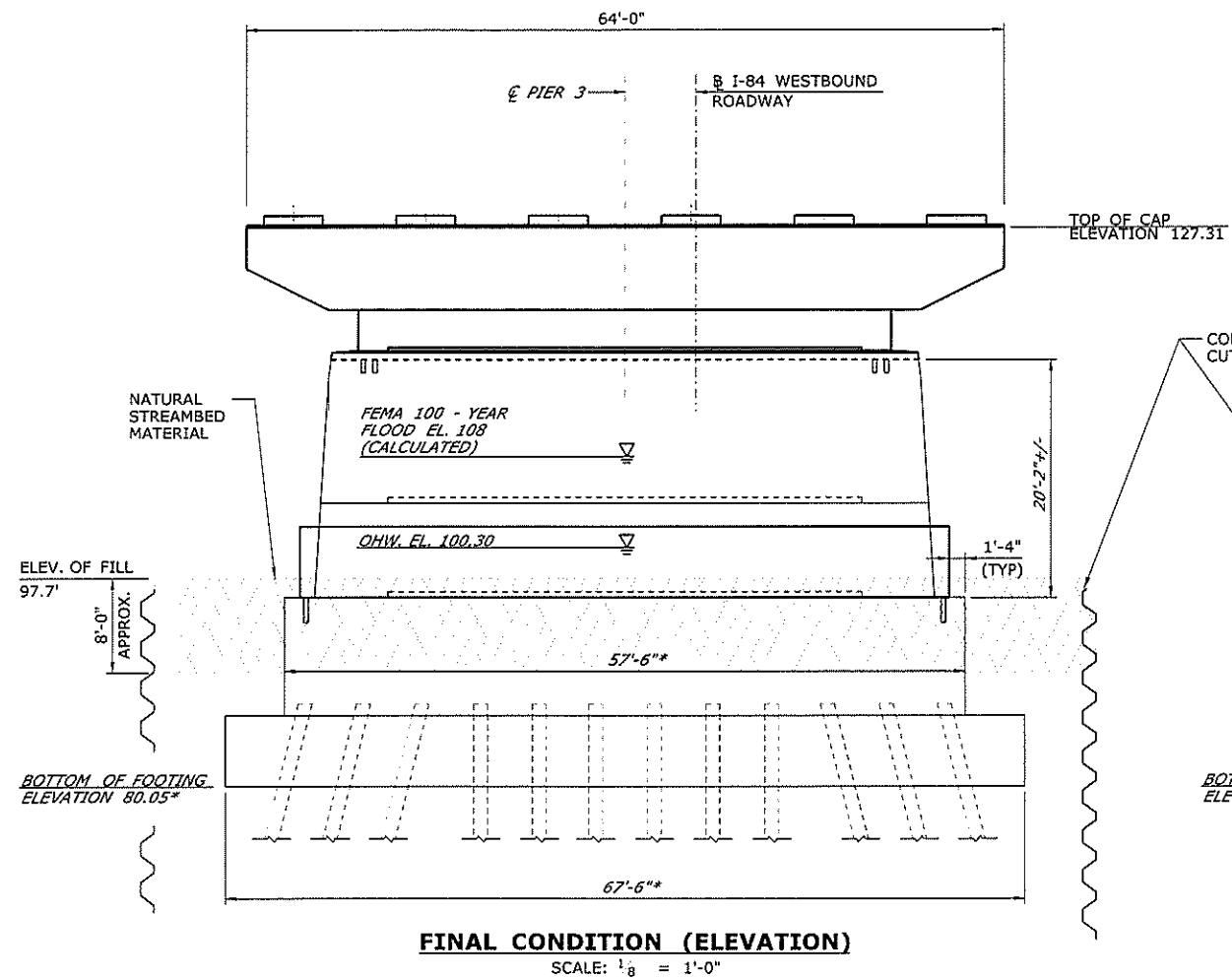
100 YEAR FLOODPLAIN IMPACT TABLE, CUT AND FILL INFORMATION	
VOLUME IMPACTS	
EXCAVATION IN FEMA FLOODPLAIN	FILL IN FEMA FLOODPLAIN
740 CY	830 CY

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 9/24/2019

<p>DESIGNER/DRAFTER: AJM CHECKED BY: JPM SCALE AS NOTED</p>	<p>STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION</p>	<p>SIGNATURE/BLOCK: LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067</p>	<p>PROJECT TITLE: REHABILITATION OF BRIDGE NOS 01218 & 04180- I-84 EB/WB OVER HOUSATONIC RIVER</p>	<p>TOWN: NEWTOWN/SOUTHBURY PROJECT NO.: 96-201 DRAWING NO.: PMT-05 SHEET NO.:</p>								
<p>THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.</p>	<p>Plotted Date: 9/24/2019</p>	<p>Filename: ...15B_MSTL_0095_0201_PMT-05.dgn</p>	<p>REVISIONS:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV.</th> <th>DATE</th> <th>REVISION DESCRIPTION</th> <th>SHEET NO.</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REV.	DATE	REVISION DESCRIPTION	SHEET NO.					<p>DRAWING TITLE: 100 YEAR FLOOD IMPACT PLAN</p>
REV.	DATE	REVISION DESCRIPTION	SHEET NO.									

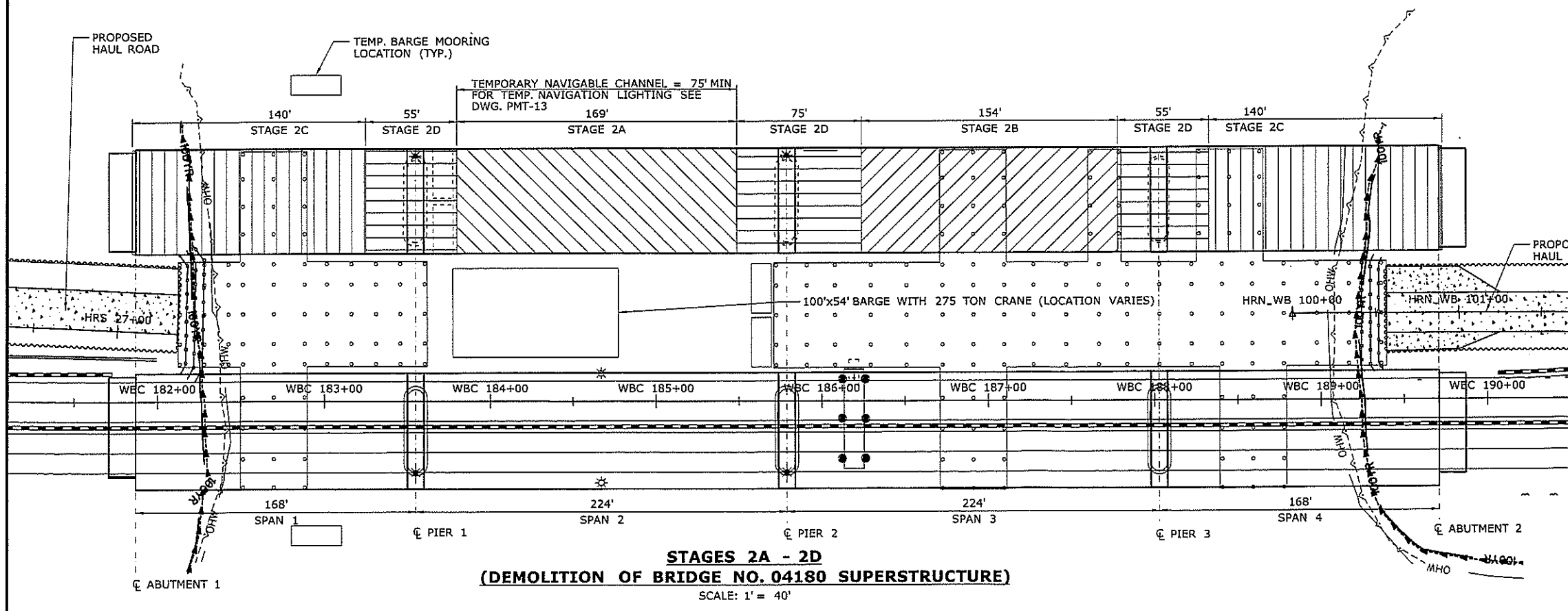
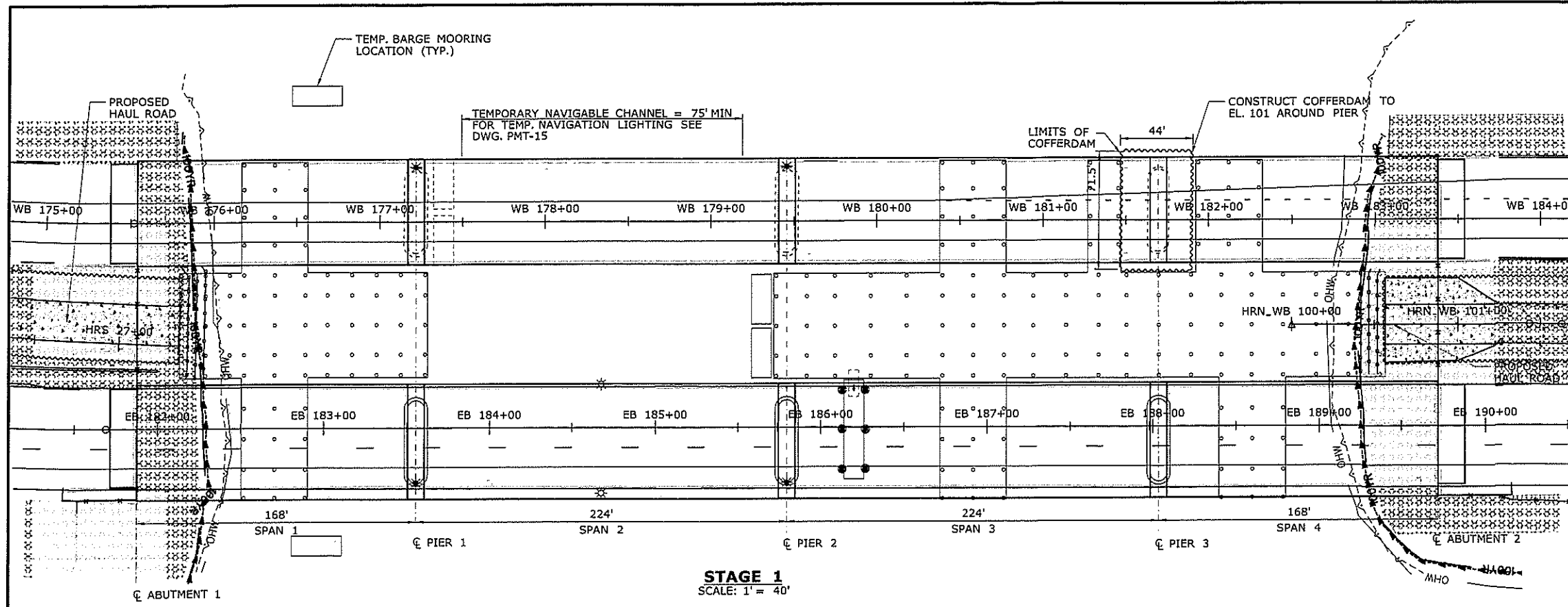
LEGEND

-  EXCAVATION
-  NATURAL STREAMBED MATERIAL



* PER AS BUILT INFORMATION

<p>DESIGNER/DRAFTER: AJM CHECKED BY: JPM SCALE AS NOTED</p>		<p>STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION</p>		<p>PROJECT TITLE: REHABILITATION OF BRIDGE NO. 04180- I-84 WB OVER HOUSATONIC RIVER</p>		<p>TOWN: NEWTOWN/SOUTHBURY</p>		<p>PROJECT NO. 96-201</p>	
<p>THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.</p>		<p>Signature/Block: LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067</p>		<p>DRAWING TITLE: I-84 WB PIER 3 CUT/FILL LIMITS</p>		<p>DRAWING NO. PMT-06</p>		<p>SHEET NO.</p>	
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 9/27/2019	Filename: ..\SB MSTL 0096 0201.PMT-06.dgn				



NOTES:

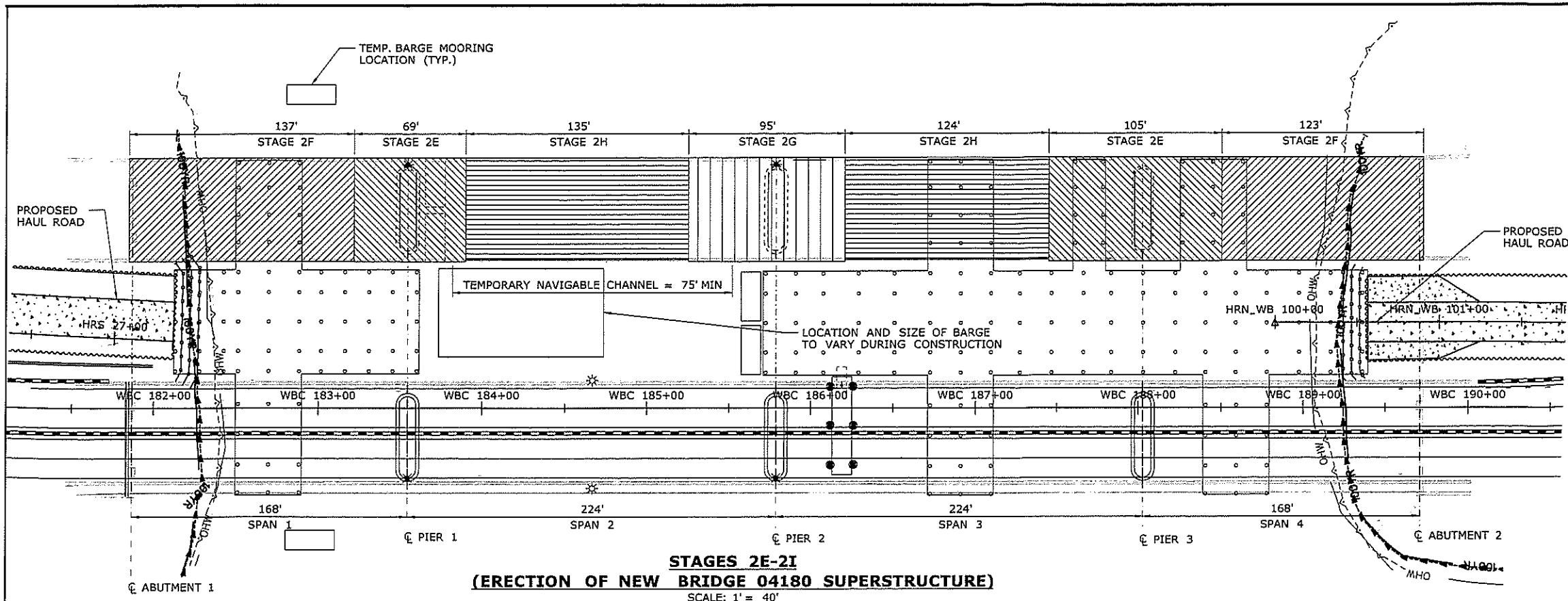
- CONTRACTOR BARGES AND WORK BOATS TO BE TIED OFF OR ANCHORED WITH SPUDS IN SPANS 1 & 3 WHEN NOT IN USE.
- STAGE 1 - SUGGESTED CONSTRUCTION SEQUENCE:**
- INSTALL SEDIMENTATION CONTROL SYSTEM.
 - PERFORM THE CONTROL AND REMOVAL OF INVASIVE SPECIES LOCATED WITHIN THE DISTURBED AREAS IN ACCORDANCE WITH ITEM #0952051A - CONTROL AND REMOVAL OF INVASIVE VEGETATION.
 - CONSTRUCT HAUL ROADS IN APPROACHES.
 - DRIVE PILES AND BUILD TEMPORARY TRESTLES AND CONSTRUCT A COFFERDAM AROUND PIER 3. CONSTRUCTION OF TEMPORARY TRESTLES SHALL BE FROM BARGES OR OTHER FLOATED PLATFORMS. THE CONTRACTOR SHALL NOT LAUNCH BARGES FROM STATE OWNED BOAT LAUNCH.
 - PLACE SIGNS AND CHANNEL MARKERS TO DELINEATE TEMPORARY CHANNEL FOR BOAT TRAFFIC. BLOCKAGE OF NAVIGATION CHANNEL FOR DEMOLITION AND CONSTRUCTION SHALL REQUIRE THE PRIOR WRITTEN PERMISSION OF THE ENGINEER.
 - CONSTRUCT CROSSOVER ROADWAY IN MEDIAN AND TEMPORARY ROAD CLOSURES FOR IN ROAD PREP WORK FOR CROSSOVER.
- STAGE 2A - SUGGESTED CONSTRUCTION SEQUENCE:**
- INSTALL DEBRIS SHIELD
 - REMOVE PARAPETS, DECK, STRINGERS, AND FLOORBEAM CANTILEVERS FROM ALL OF SPANS.
 - INSTALL TEMPORARY SUPPORTS/BRACING AT PIER 1 AND PIER 2 TO PROVIDE ADDITIONAL SUPPORTS FOR PRIMARY GIRDERS.
 - REMOVE FLOORBEAMS AND LATERAL BRACING FROM CENTER OF SPAN IN AREA INDICATED.
 - REMOVE MID-SPAN SECTION OF MAIN GIRDERS IN AREA INDICATED.
- NOTE: ESTIMATED DURATION OF NAVIGATION CHANNEL BLOCKAGE IS ONE (1) DAY.
- STAGE 2B - SUGGESTED CONSTRUCTION SEQUENCE:**
- INSTALL TEMPORARY SUPPORTS AT PIER TO PROVIDE ADDITIONAL SUPPORTS FOR CANTILEVERS.
 - REMOVE FLOORBEAMS, AND LATERAL BRACING FROM CENTER OF SPAN AS INDICATED.
 - REMOVE MID-SPAN SECTION OF MAIN GIRDERS AS INDICATED.
- STAGE 2C - SUGGESTED CONSTRUCTION SEQUENCE:**
- REMOVE FLOORBEAMS AND LATERAL BRACING FROM END OF SPANS AS INDICATED.
 - REMOVE END SECTION OF MAIN GIRDERS AS INDICATED.
- STAGE 2D - SUGGESTED CONSTRUCTION SEQUENCE:**
- INSTALL TEMPORARY BRACING TO STABILIZE MAIN GIRDERS DURING FLOORBEAM AND LATERAL BRACING REMOVAL.
 - REMOVE REMAINING FLOORBEAMS, AND LATERAL BRACING.
 - REMOVE REMAINING SECTIONS OF MAIN GIRDERS.
- NOTE: NAVIGATION CHANNEL SHALL BE CLOSED TO BOAT TRAFFIC DURING DURATION OF STEEL PICKS WITHIN SPAN 2. ESTIMATED DURATION = 2 DAYS.
- LEGEND:**
- ☆ GREEN NAVIGATIONAL LIGHT
 - ★ RED NAVIGATIONAL LIGHT
 - 100YR FEMA 100-YEAR FLOOD (CALCULATED)
 - OHW ORDINARY HIGH WATER
 - FIRSTLIGHT PROJECT BOUNDARY
 - STATE/FEDERAL WETLANDS
 - SEDIMENTATION CONTROL SYSTEM (SCS)
 - TEMPORARY EARTH RETAINING SYSTEM (TERS)
 - ▨ STAGE 2A
 - ▧ STAGE 2B
 - ▩ STAGE 2C
 - STAGE 2D
 - INVASIVE SPECIES CONTROL AREA

TEMPORARY HYDRAULIC DATA	
AVERAGE DAILY FLOW (CFS)	2,500 ¹
AVERAGE SPRING FLOW (CFS)	5,000 ¹
2-YEAR FREQUENCY DISCHARGE (CFS)	20,000 ¹
TEMPORARY DESIGN DISCHARGE (CFS)	42,000 ¹
TEMPORARY DESIGN FREQUENCY (YRS)	10
TEMPORARY WATER SURFACE ELEV (FT) - UPSTREAM	100 ¹
TEMPORARY WATER SURFACE ELEV (FT) - DOWNSTREAM	100 ¹

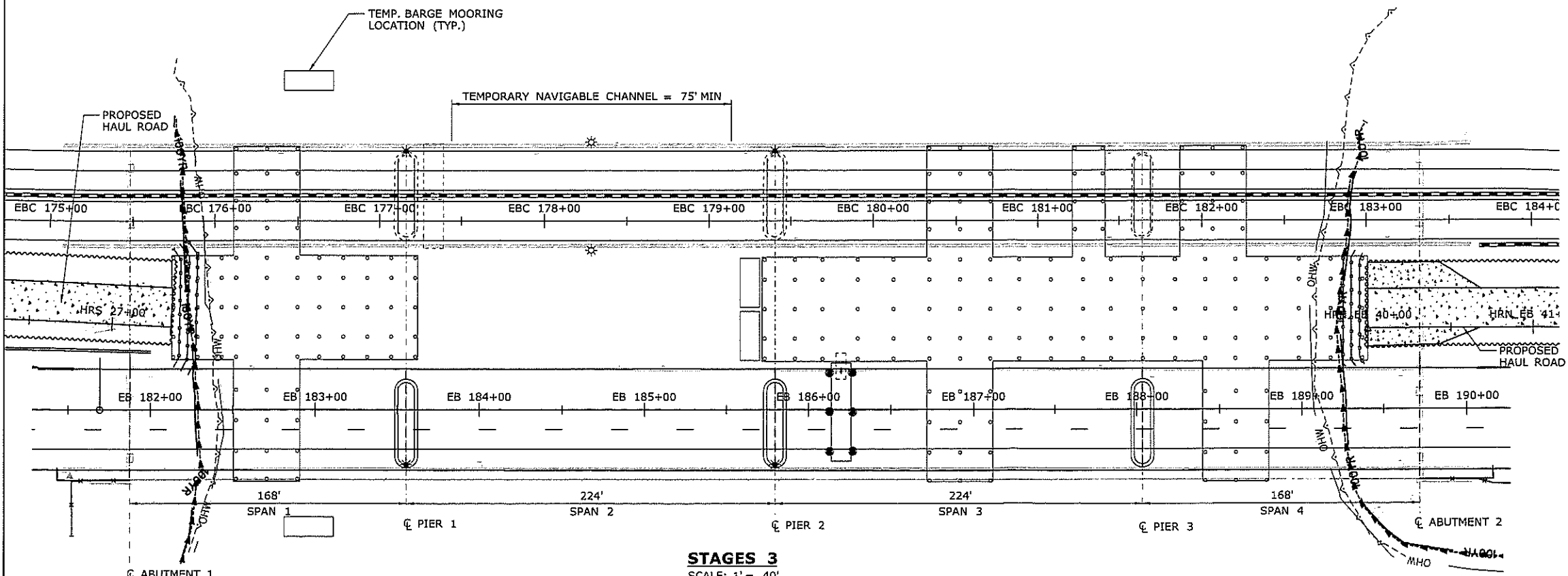
NOTE: ELEVATIONS PROVIDED ARE REFERENCED TO NAVD83 DATUM.
¹CALCULATED AS PER CTDOT DRAINAGE MANUAL SEC. 6.16 BASED ON DRAINAGE AREA.
²TRANSFERRED FROM GAGE NO. 01205500 ON HOUSATONIC RIVER.
³FAIRFIELD COUNTY FLOOD INSURANCE STUDY, OCT. 16, 2013

ENVIRONMENTAL PERMIT PLANS
 PLAN DATE: 9/24/2019

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	CHECKED BY: JPM				SCALE AS NOTED	DRAWING TITLE: CONSTRUCTION STAGING - 1
REV. DATE REVISION DESCRIPTION SHEET NO. Plotted Date: 9/27/2019		F:\name: ...SB_MSTL_0096_0201_PMT-07.dgn				



**STAGES 2E-2I
(ERECTION OF NEW BRIDGE 04180 SUPERSTRUCTURE)**
SCALE: 1' = 40'



STAGES 3
SCALE: 1' = 40'

NOTES:

1. CONTRACTOR BARGES AND WORK BOATS TO BE TIED OFF OR ANCHORED WITH SPUDS IN SPANS 1 & 3 WHEN NOT IN USE.

STAGE 2E - SUGGESTED CONSTRUCTION SEQUENCE:

1. COMPLETE SUBSTRUCTURE REPAIRS TO PIERS AND ABUTMENTS FROM TRESTLE, FINGERS AND/OR BARGES.
2. COMPLETE MODIFICATIONS OF ABUTMENTS AND PIERS (INCLUDES COLLAR CONSTRUCTION AT PIER 3).
3. INSTALL PROPOSED GIRDERS OVER PIER 1 AND PIER 3.
4. INSTALL DIAPHRAGMS AND LATERAL BRACING.

STAGE 2F - SUGGESTED CONSTRUCTION SEQUENCE:

1. INSTALL END GIRDER SECTIONS IN SPAN 1 AND SPAN 4 AND SPLICE WITH PREVIOUSLY INSTALLED SECTIONS OVER PIER 1 AND PIER 3, RESPECTIVELY.
2. INSTALL DIAPHRAGMS AND LATERAL BRACING IN SPAN 1 AND SPAN 4.

STAGE 2G - SUGGESTED CONSTRUCTION SEQUENCE:

1. INSTALL PROPOSED GIRDERS OVER PIER 2 AND TEMPORARILY SUPPORT CANTILEVERS.
2. INSTALL DIAPHRAGMS AND LATERAL BRACING.

STAGE 2H - SUGGESTED CONSTRUCTION SEQUENCE:

1. INSTALL REMAINING MID-SPAN GIRDER SECTIONS IN SPAN 2 AND SPAN 3 AND SPLICE WITH PREVIOUSLY INSTALLED SECTIONS OVER PIER 1, PIER 2, AND PIER 3, RESPECTIVELY.
2. INSTALL ALL REMAINING DIAPHRAGMS AND LATERAL BRACING.

STAGE 2I - SUGGESTED CONSTRUCTION SEQUENCE:

1. REMOVE TEMPORARY SUPPORTS AT ALL PIERS.
2. BACKFILL WORK AREA AT PIER 3 COLLAR WITH NATURAL STREAMBED MATERIAL.
3. REMOVE COFFERDAM FROM PIER 3. CUT SHEETING A MINIMUM OF 1' BELOW MUDLINE.
4. INSTALL PROPOSED DECK AND PARAPETS.

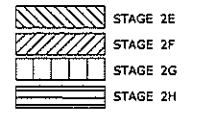
NOTE: NAVIGATION CHANNEL SHALL BE CLOSED FOR DURATION OF STEEL PICKS OCCURRING IN SPAN 2 DURING ANY STAGE. ESTIMATED DURATION = 3 DAYS.

STAGE 3 - SUGGESTED CONSTRUCTION SEQUENCE:

1. REMOVE CROSSOVER ROADWAY IN MEDIAN AND RE-ROUTE TRAFFIC TO NEW BRIDGE.
2. CONSTRUCT NEW CROSSOVER ROADWAY IN MEDIAN AND TEMPORARY ROAD CLOSURES FOR IN ROAD PREP WORK FOR CROSSOVER.
3. CLOSE EASTBOUND BRIDGE AND RE-ROUTE TRAFFIC OVER CROSSOVER TO NEW BRIDGE.
4. REMOVAL OF EXISTING TEMPORARY GREEN NAVIGATION LIGHT ON EXISTING EASTBOUND BRIDGE AND INSTALLATION OF TEMPORARY GREEN NAVIGATION LIGHT ON NEW WESTBOUND BRIDGE.

LEGEND:

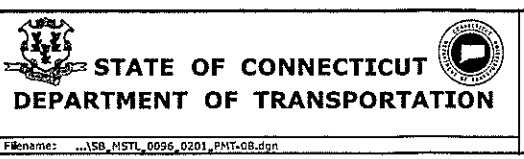
- ☆ GREEN NAVIGATIONAL LIGHT
- ★ RED NAVIGATIONAL LIGHT
- 100YR — FEMA 100-YEAR FLOOD (CALCULATED)
- OHW — ORDINARY HIGH WATER
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ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 9/24/2019

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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CHECKED BY: JPM
SCALE AS NOTED

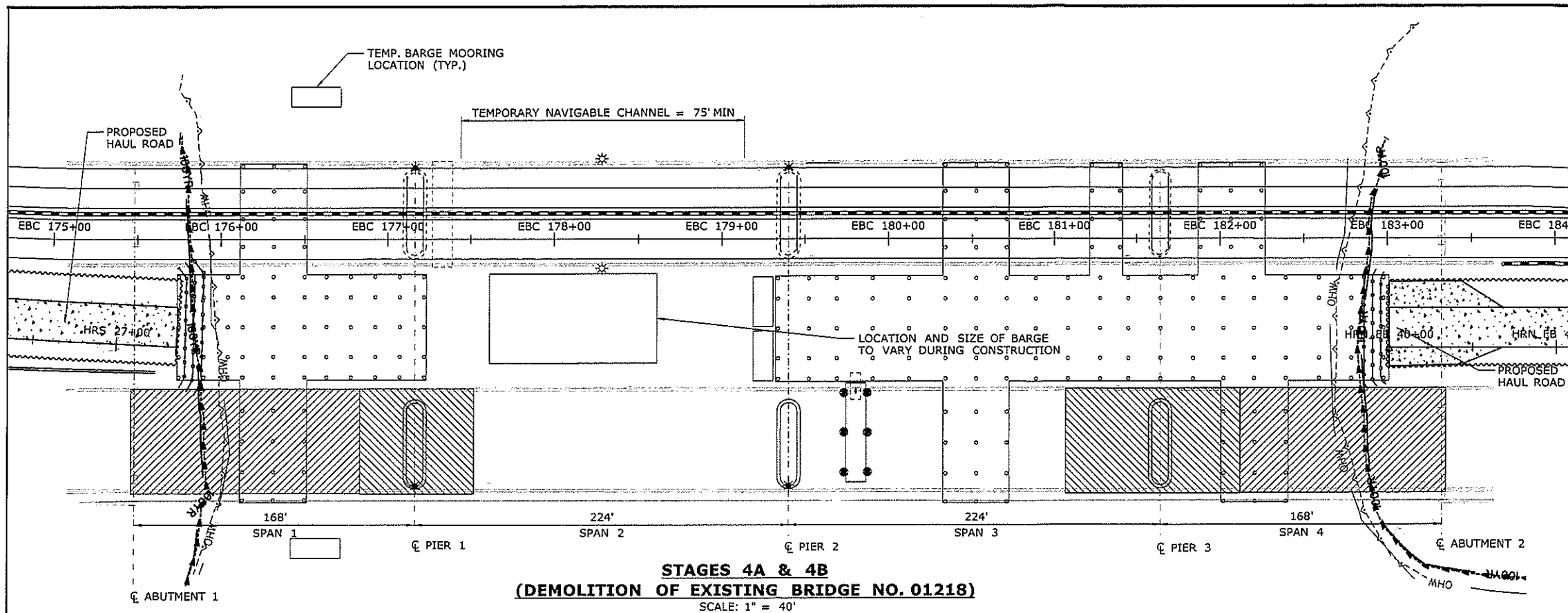


LOUIS BERGER US
A WSP COMPANY
55 CAPITAL BOULEVARD
ROCKY HILL, CT 06067

PROJECT TITLE:
**REHABILITATION OF BRIDGE NOS
01218 & 04180- I-84 EB/WB
OVER HOUSATONIC RIVER**

TOWN: **NEWTOWN/SOUTHBURY**
DRAWING TITLE:
**CONSTRUCTION
STAGING - 2**

PROJECT NO.: **96-201**
DRAWING NO.: **PMT-08**
SHEET NO.



NOTES:

1. CONTRACTOR BARGES AND WORK BOATS TO BE TIED OFF OR ANCHORED WITH SPUDS IN SPANS 1 & 3 WHEN NOT IN USE.

STAGE 4A - SUGGESTED CONSTRUCTION SEQUENCE:

1. INSTALL DEBRIS SHIELD
2. REMOVE PARAPETS, DECK, STRINGERS, AND FLOORBEAM CANTILEVERS FROM ALL SPANS.
3. INSTALL TEMPORARY SUPPORTS/BRACING AT PIERS 1 AND 2 TO PROVIDE ADDITIONAL SUPPORTS FOR PRIMARY GIRDERS.
4. REMOVE FLOORBEAMS AND LATERAL BRACING FROM CENTER OF SPAN IN AREA INDICATED.
5. REMOVE MID-SPAN SECTION OF MAIN GIRDERS IN AREA INDICATED.

STAGE 4B - SUGGESTED CONSTRUCTION SEQUENCE:

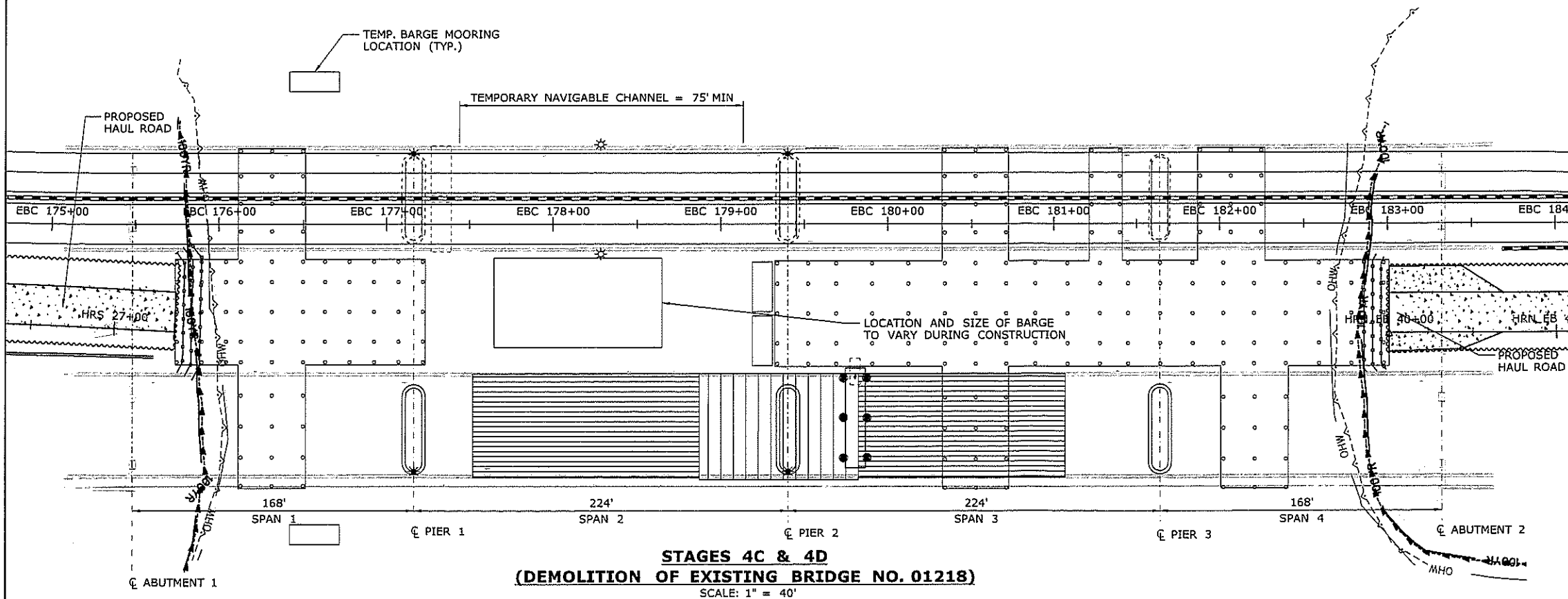
1. INSTALL TEMPORARY SUPPORTS AT PIER 3 TO PROVIDE ADDITIONAL SUPPORTS FOR CANTILEVERS.
2. REMOVE FLOORBEAMS AND LATERAL BRACING FROM CENTER OF SPAN AS INDICATED.
3. REMOVE MID-SPAN SECTION OF MAIN GIRDERS AS INDICATED.

STAGE 4C - SUGGESTED CONSTRUCTION SEQUENCE:

1. INSTALL PROPOSED GIRDERS OVER PIER 2 AND TEMPORARILY SUPPORT CANTILEVERS.
2. INSTALL DIAPHRAGMS AND LATERAL BRACING.

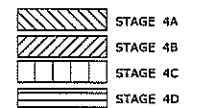
STAGE 4D - SUGGESTED CONSTRUCTION SEQUENCE:

1. INSTALL REMAINING MID-SPAN GIRDER SECTIONS IN SPAN 2 AND SPAN 3 AND SPLICE WITH PREVIOUSLY INSTALLED SECTIONS OVER PIER 1, PIER 2, AND PIER 3, RESPECTIVELY.
2. INSTALL ALL REMAINING DIAPHRAGMS AND LATERAL BRACING.



LEGEND:

- ⊙ GREEN NAVIGATIONAL LIGHT
- ⊙ RED NAVIGATIONAL LIGHT
- FEMA 100-YEAR FLOOD (CALCULATED)
- OHW --- ORDINARY HIGH WATER
- FIRSTLIGHT PROJECT BOUNDARY
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- SEDIMENTATION CONTROL SYSTEM (SCS)
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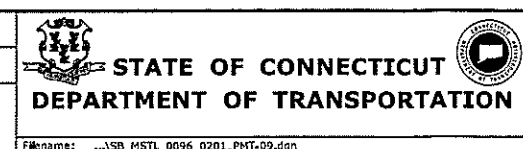
ENVIRONMENTAL PERMIT PLANS

PLAN DATE: 9/24/2019

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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SCALE AS NOTED

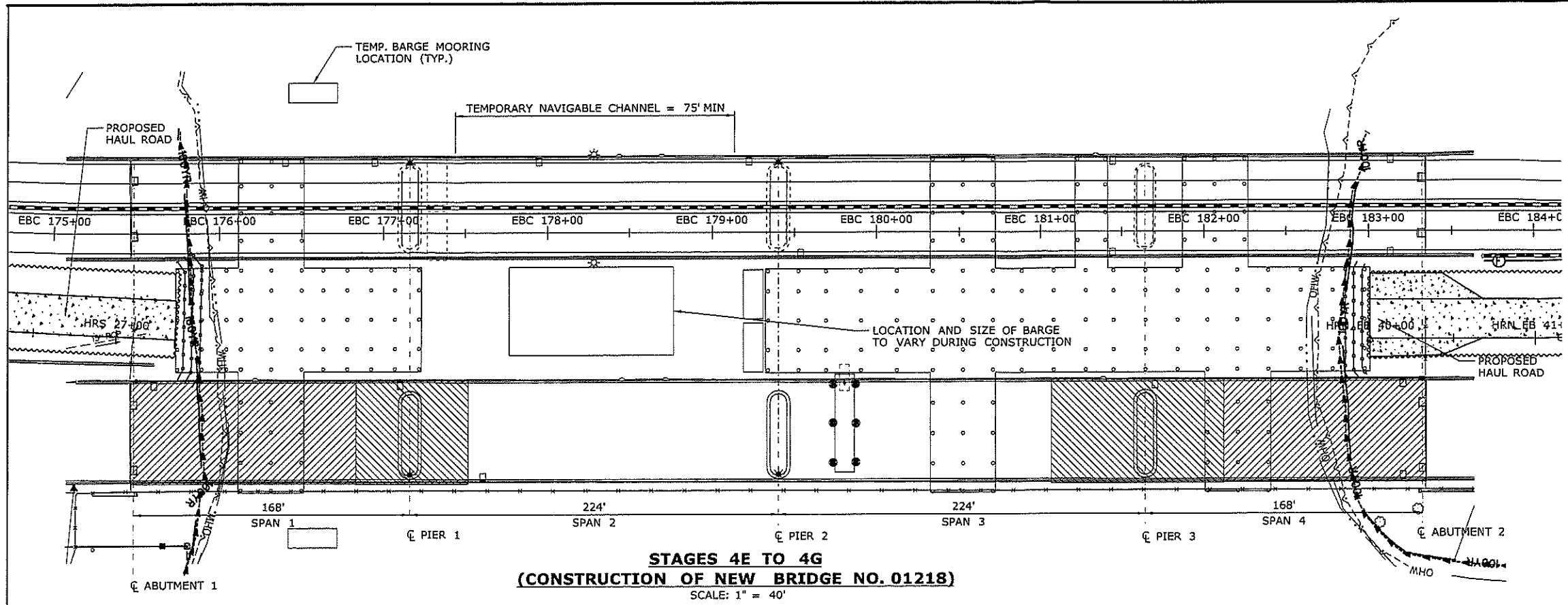


SIGNATURE BLOCK
LOUIS BERGER US
A WSP COMPANY
55 CAPITAL BOULEVARD
ROCKY HILL, CT 06057

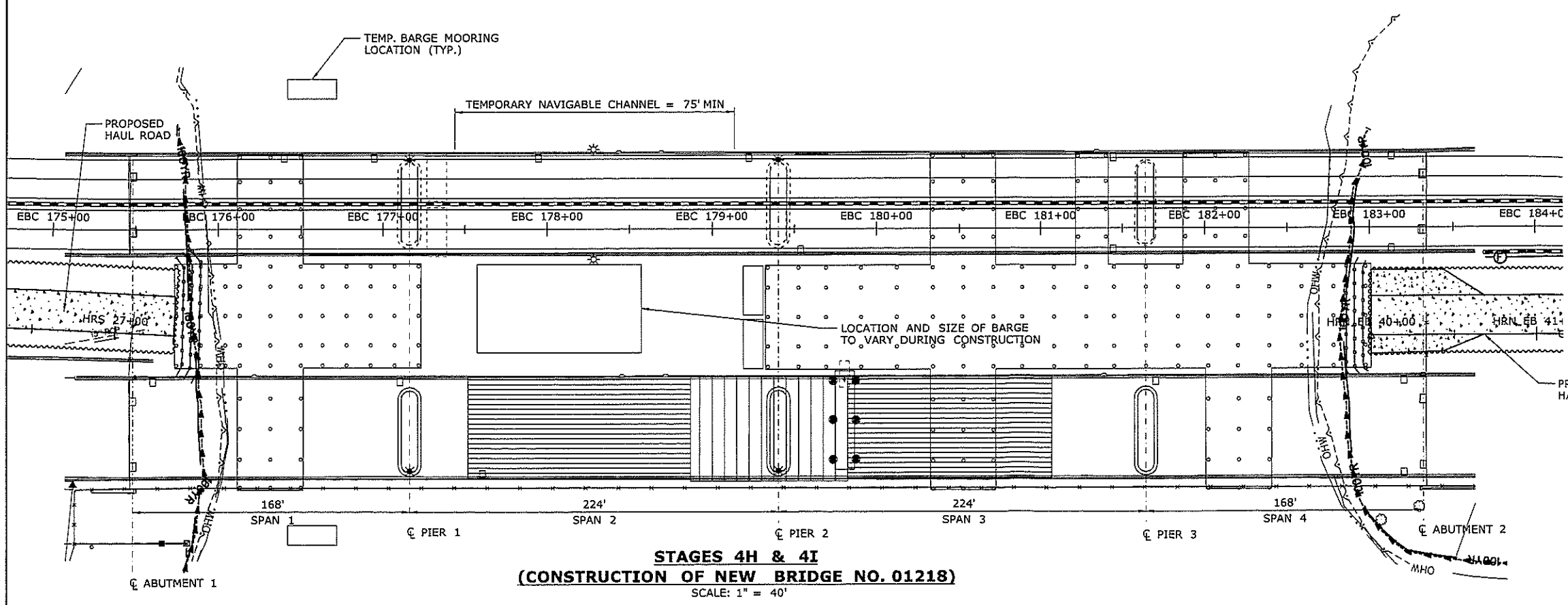
PROJECT TITLE:
REHABILITATION OF BRIDGE NOS
01218 & 04180- I-84 EB/WB
OVER HOUSATONIC RIVER

TOWN: **NEWTOWN/SOUTHBURY**
DRAWING TITLE:
CONSTRUCTION
STAGING - 3

PROJECT NO. **96-201**
DRAWING NO. **PMT-09**
SHEET NO.



- STAGE 4E - SUGGESTED CONSTRUCTION SEQUENCE:**
1. CONSTRUCT NEW PIER CAPS.
 2. CONSTRUCTION OF THE EXISTING ABUTMENT MODIFICATIONS.
- STAGE 4F - SUGGESTED CONSTRUCTION SEQUENCE:**
1. CONSTRUCTION OF NEW DECK IN AREA INDICATED.
- STAGE 4G - SUGGESTED CONSTRUCTION SEQUENCE:**
1. CONSTRUCTION OF NEW DECK IN AREA INDICATED.
- STAGE 4H - SUGGESTED CONSTRUCTION SEQUENCE:**
1. CONSTRUCTION OF NEW DECK IN AREA INDICATED.
- STAGE 4I - SUGGESTED CONSTRUCTION SEQUENCE:**
1. CONSTRUCTION OF NEW DECK IN AREA INDICATED.
 2. CONSTRUCTION OF NEW PARAPETS, SUPERSTRUCTURE AND MISC. REMAINING ITEMS.
 3. REMOVAL OF THE DEBRIS SHIELD.
- STAGE 5 - SUGGESTED CONSTRUCTION SEQUENCE:**
1. REMOVE TEMPORARY M&PT AND RESTORE TRAFFIC PATTERN.
 2. REMOVE ALL TEMPORARY TRESTLE PILES.
 3. REMOVE TEMPORARY TRESTLE AND HAUL ROAD.
 4. REMOVE CROSSOVER AND RESTORE MEDIAN. ESTABLISH NEW TURF AND WILDFLOWERS IN MEDIAN ON ALL DISTURBED AREAS.
 5. REMOVE TEMPORARY BOATING SIGNS.
 6. PROJECT CLOSEOUT ITEMS.



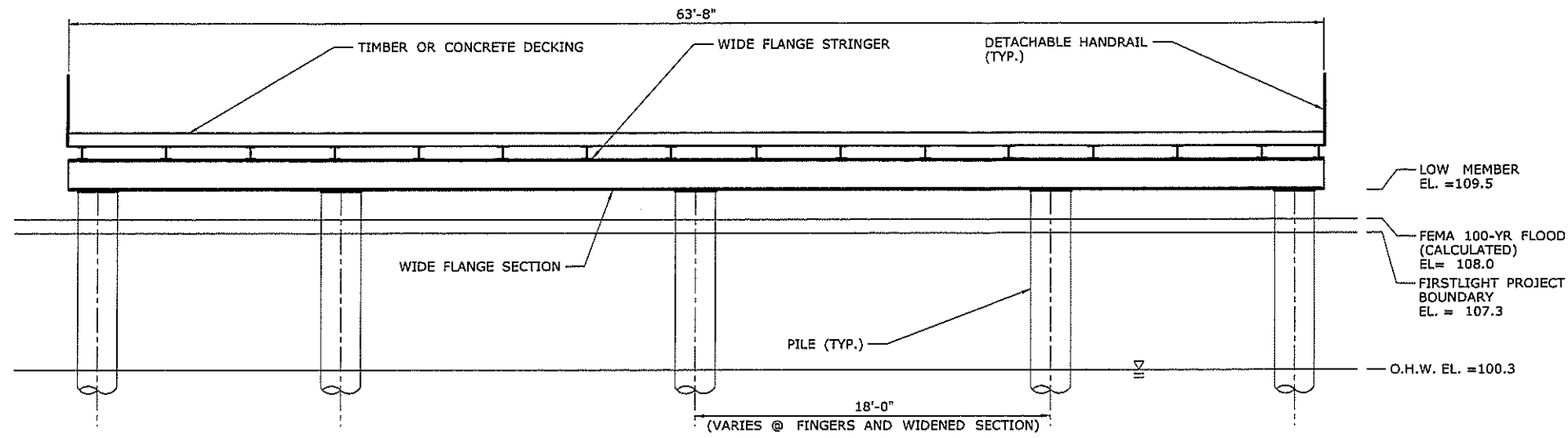
- LEGEND:**
- ☆ GREEN NAVIGATIONAL LIGHT
 - ★ RED NAVIGATIONAL LIGHT
 - 100YR — FEMA 100-YEAR FLOOD (CALCULATED)
 - OHW — ORDINARY HIGH WATER
 - FIRSTLIGHT PROJECT BOUNDARY
 - STATE/FEDERAL WETLANDS
 - SEDIMENTATION CONTROL SYSTEM (SCS)
 - TEMPORARY EARTH RETAINING SYSTEM (TERS)
- ▨ STAGE 4F
 - ▩ STAGE 4G
 - ▧ STAGE 4H
 - ▦ STAGE 4I

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 9/24/2019

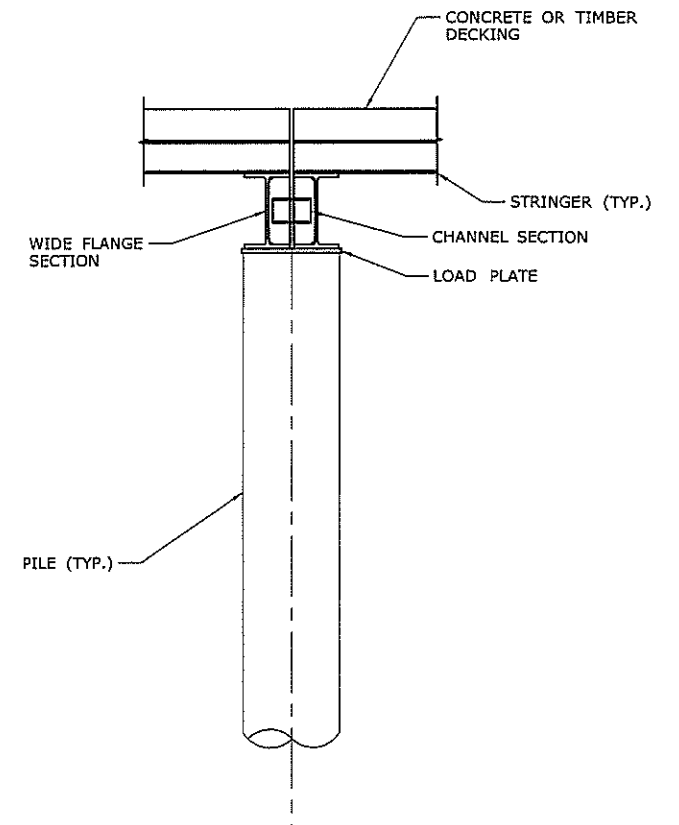
THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATION BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.	DESIGNER/DRAFTER: AJM	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION	LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067	PROJECT TITLE:	TOWN:	PROJECT NO.:
	CHECKED BY: JPM			REHABILITATION OF BRIDGE NOS 01218 & 04180- I-84 EB/WB OVER HOUSATONIC RIVER	NEWTOWN/SOUTHBURY	96-201
SCALE AS NOTED				DRAWING TITLE:		DRAWING NO.:
				CONSTRUCTION STAGING - 4 & 5		PMT-10
REV. DATE REVISION DESCRIPTION SHEET NO. Plotted Date: 9/24/2019						SHEET NO.:

NOTES:

1. TEMPORARY TRESTLE AND FALSEWORK SHALL BE DESIGNED BY THE CONTRACTOR IN ACCORDANCE WITH THE AASHTO GUIDE DESIGN SPECIFICATIONS FOR BRIDGE TEMPORARY WORKS 1ST EDITION, 1995 WITH LATEST REVISIONS TO SUIT THE MEANS AND METHODS USED FOR CONSTRUCTION. THE CONTRACTOR'S DESIGN SHALL HAVE A LOW CHORD ELEVATION ABOVE THE FEMA 100-YR FLOOD ELEVATION OF 108.0 FEET.
2. PILES INSTALLED IN THE VICINITY OF THE EXISTING BRIDGE FOUNDATIONS SHALL BE LOCATED TO AVOID POTENTIAL CONFLICTS WITH EXISTING PILES AND OTHER OBSTRUCTIONS.
3. ALL PILES SHALL BE REMOVED DURING TRESTLE REMOVAL. ANY PILES THAT ARE NOT ABLE TO BE REMOVED SHALL BE CUT 2' (MIN.) BELOW THE MUDLINE.
4. THE DESIGN AND CONSTRUCTION OF TEMPORARY WORK TRESTLE, CRANE MATS, FLOATING DOCKS SHALL BE PAID FOR UNDER ITEM NO. 0502185A "TEMPORARY TRESTLE (SITE NO.1) AND ITEM NO. 0502186A "TEMPORARY TRESTLE (SITE NO.2)". SEE SPECIAL PROVISIONS.
5. CONSTRUCTION OF TEMPORARY TRESTLE SHALL BE PERFORMED FROM BARGES, OTHER FLOATED PLATFORMS, OR THE SHORE.
6. THE INFORMATION SHOWN ON THIS DRAWING, INCLUDING (AS APPLICABLE) SIZES OF MEMBERS, THE SEQUENCE OF CONSTRUCTION, AND ERECTION PROCEDURES CONVEYS THE ASSUMPTIONS MADE BY THE DESIGNER IN DESIGNING THE STRUCTURE, AND IS FOR INFORMATIONAL USE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SELECTING THE MEANS AND METHODS FOR CONSTRUCTION. THE CONTRACTOR SHALL ALSO SUBMIT INFORMATION INCLUDING DESIGN CALCULATIONS, CONSTRUCTION SCHEMATICS, AND CONSTRUCTION SEQUENCES AND PROCEDURES TO THE ENGINEER FOR REVIEW.
7. CONTRACTOR IS HEREBY NOTIFIED THAT ALL TEMPORARY WORKS AND EQUIPMENT SHALL MEET THE REQUIREMENTS OF APPLICABLE U.S. COAST GUARD AND CT DEEP BOATING REGULATIONS AND THE REQUIREMENTS OF THE BOAT SAFETY PLAN. SEE DWG PMT-13 FOR BOAT SAFETY PLAN.
8. BARGES DOCKED OR ANCHORED AT TRESTLE IN SPAN 2 SHALL NOT EXCEED 60' X 100'. MINIMUM CLEAR CHANNEL AS INDICATED ON THE PLANS SHALL BE MAINTAINED AT ALL TIMES UNLESS OTHERWISE APPROVED BY THE ENGINEER.



SECTION THROUGH MAIN TRESTLE
SCALE: 3/4" = 1'-0"



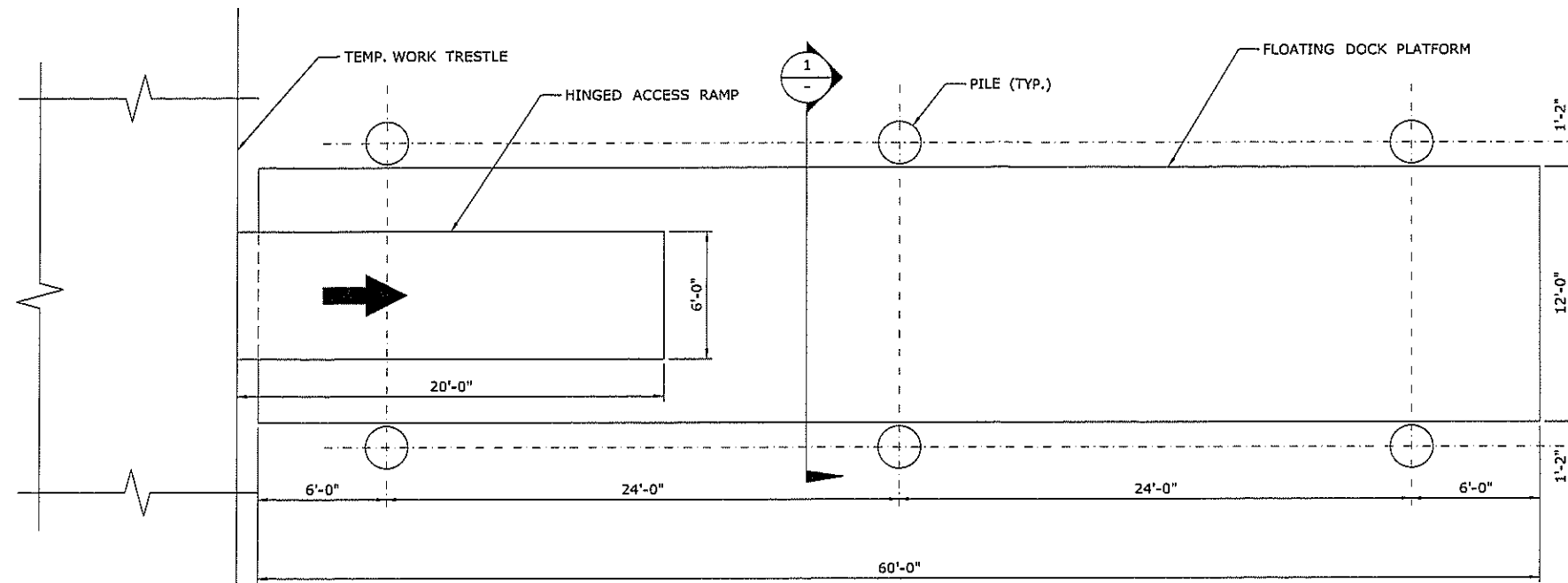
SECTION PILE BENT
SCALE: 1/2" = 1'-0"

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 9/24/2019

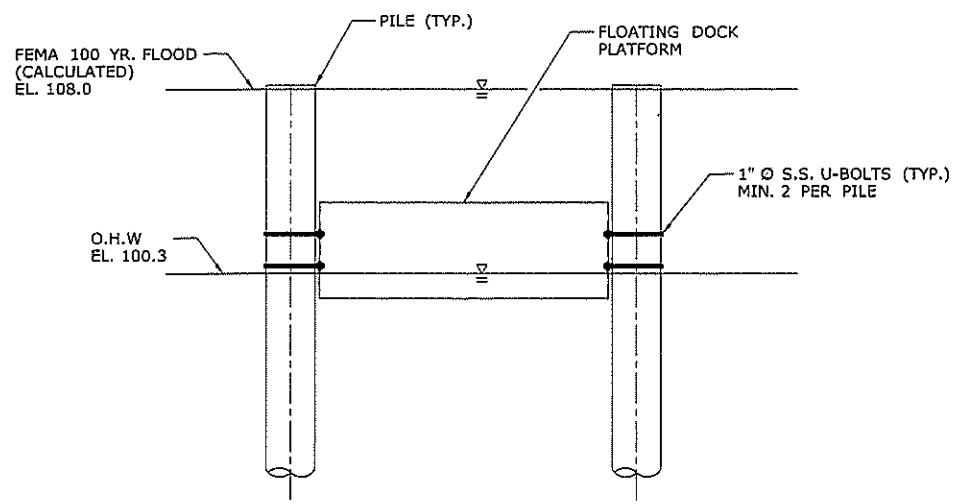
THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE, AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.	DESIGNER/DRAFTER: JPM	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION	LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067	PROJECT TITLE:	TOWN:	PROJECT NO.
	CHECKED BY: JS			REHABILITATION OF BRIDGE NO 01218/04180 - I-84 OVER HOUSATONIC RIVER	NEWTOWN/SOUTHBURY	96-201
REV. DATE REVISION DESCRIPTION SHEET NO. Plotted Date: 9/27/2019	SCALE AS NOTED	Filename: ...\\SB_MSTL_0096_0201_PMT-11.dgn		DRAWING TITLE:	DRAWING NO.	SHEET NO.
				TEMPORARY TRESTLE DETAILS 1	PMT-11	

NOTES:

1. SEE DWG. PMT-11 FOR TRESTLE NOTES.



FLOATING DOCK PLAN
SCALE: 1/4" = 1'-0"

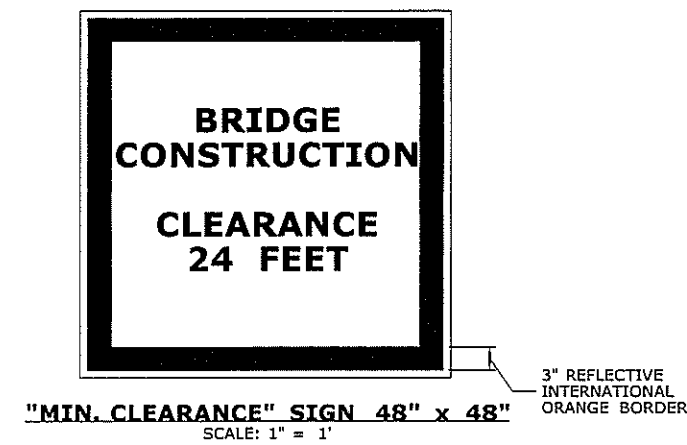
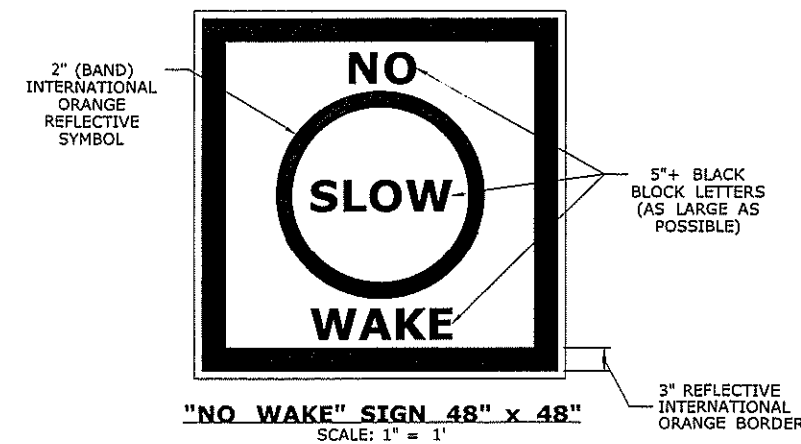
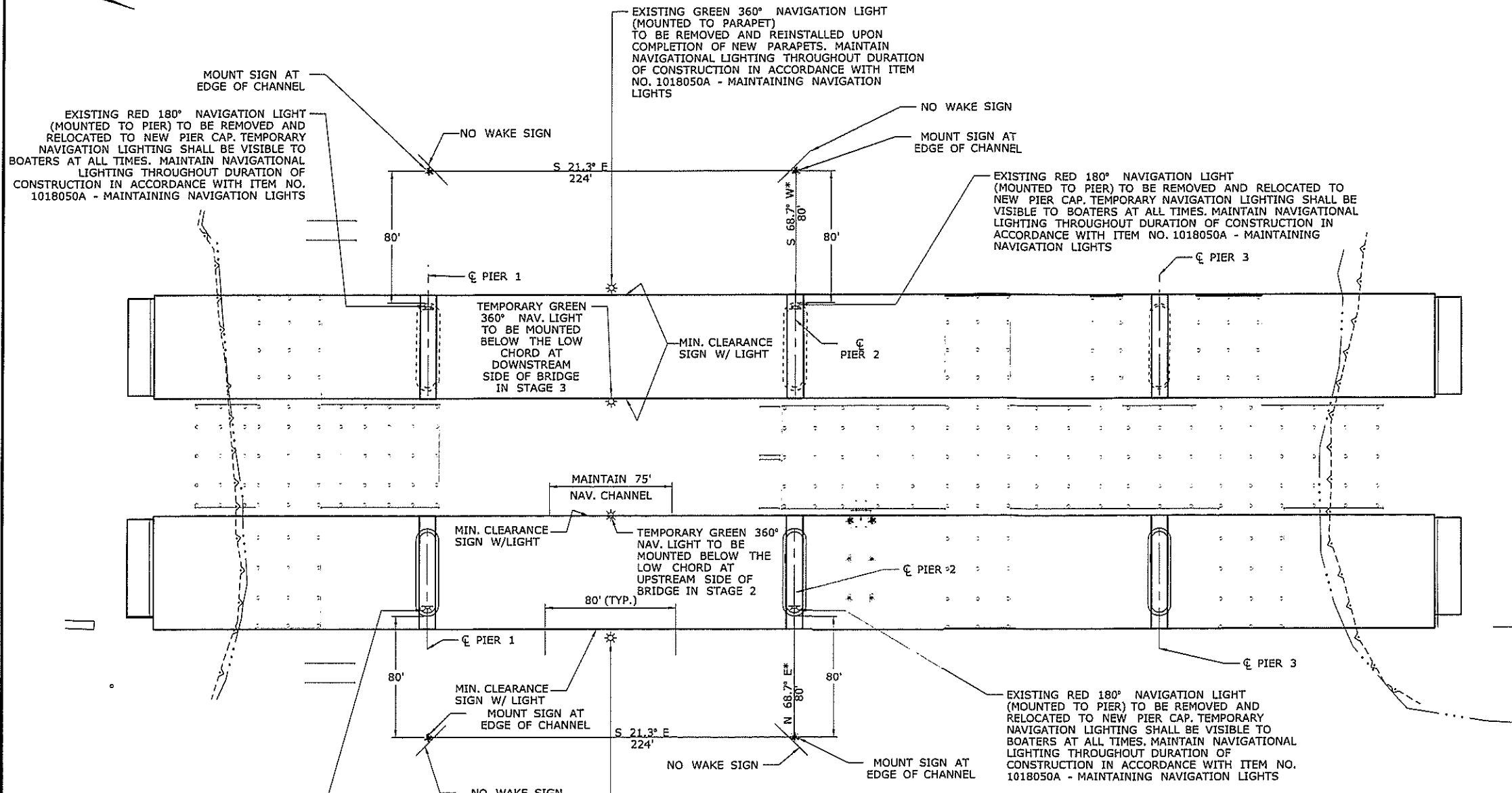


1 SECTION
SCALE: 1/2" = 1'-0"

ENVIRONMENTAL PERMIT PLANS

PLAN DATE: 9/24/2019

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.		DESIGNER/DRAFTER: JPM CHECKED BY: DF SCALE AS NOTED	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION Louis Berger US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067	PROJECT TITLE: REHABILITATION OF BRIDGE NO 01218/04180 - I-84 OVER HOUSATONIC RIVER	TOWN: NEWTOWN/SOUTHBURY DRAWING TITLE: TEMPORARY TRESTLE DETAILS 2	PROJECT NO. 96-201 DRAWING NO. PMT-12 SHEET NO.
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 9/24/2019		



NOTE:
 ALL LETTERING ON SIGN MUST BE BLACK, BLOCK IN STYLE AND 3" (MIN.) IN HEIGHT. SIGN BACKGROUND TO BE WHITE (TYP. ALL SIGNS)

BOAT SAFETY PLAN
 SCALE: 1" = 40'

- NOTES:**
1. ALL TEMPORARY WORKS AND EQUIPMENT SHALL MEET THE REQUIREMENTS OF THE US COAST GUARD AND CT DEEP BOATING.
 2. ALL WORK AND MATERIALS REQUIRED TO ESTABLISH, MAINTAIN AND REMOVE BUOYS, SIGNS, LIGHTS AND CHANNEL MARKERS AS SHOWN ON THE BOAT SAFETY PLAN OR OTHERWISE REQUIRED BY THE COAST GUARD, DEEP BOATING OR THE ENGINEER SHALL BE INCLUDED AND PAID FOR UNDER ITEM NUMBER 1018013 "TEMPORARY WATERWAY CONSTRUCTION MARKERS". SEE SPECIAL PROVISIONS.
 3. NAVIGATION LIGHTS ATTACHED TO BRIDGE SHALL REMAIN ON AT ALL TIMES IN ACCORDANCE WITH ITEM NO. 1018050A - MAINTAINING NAVIGATION LIGHTS.
 4. FULL NAVIGATION CHANNEL CLOSURES SHALL NOT OCCUR DURING WEEKENDS FROM MAY 1ST UNTIL OCTOBER 1ST
 5. CONTRACTOR BARGES AND WORK BOATS TO BE TIED OFF OR ANCHORED WITH SPUDS IN SPANS 1 & 3 WHEN NOT IN USE.
 6. DEEP BOATING AND THE LAKE ZOAR AUTHORITY MUST BE CONTACTED PRIOR TO CHANNEL CLOSURES.
 7. BEACONS (SIGNS) MUST BE MANUFACTURED OF EIGHTY GAUGE ALUMINUM OR POLYMER OF HARD PLASTIC EQUIVALENT AT LEAST THREE MILLS THICK, OR THREE- QUARTER INCH (3/4") MARINE GRADE PLYWOOD. THEY MUST BE REFLECTIVE WHITE WITH AN INTERNATIONAL ORANGE BAND OF AT LEAST THREE INCHES (3") IN WIDTH FORMING THE OUTER BORDER. ALL SIGNS MUST BE ILLUMINATED

LEGEND:
 * 360° GREEN NAVIGATION LIGHT
 ** 180° RED NAVIGATION LIGHT

* COMPASS BEARING AND DISTANCE BEGINS AT THE FACE OF CENTER LINE OF PIER

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.		DESIGNER/DRAFTER: MEB CHECKED BY: JPM SCALE AS NOTED	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION Filename: ...LSB_M5TL_0095_0201_PMT-13.dgn	SIGNATURE/BLOCK: LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067	PROJECT TITLE: REHABILITATION OF BRIDGE NOS 01218 & 04180 - I-84 EB/WB OVER HOUSATONIC RIVER	TOWN: NEWTOWN/SOUTHBURY DRAWING TITLE: TEMPORARY NAVIGATION LIGHTING/ BOAT SAFETY PLAN	PROJECT NO. 96-201 DRAWING NO. PMT-13 SHEET NO.
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Printed Date: 9/24/2019			

ENVIRONMENTAL PERMIT PLANS
 PLAN DATE: 9/24/2019

Attachment D: NDDB Determination



Connecticut Department of
**ENERGY &
ENVIRONMENTAL
PROTECTION**

January 25, 2018

Mr. Michael Salter
State of Connecticut
Department of Transportation
2800 Berlin Turnpike
P.O. Box 31546
Newington, CT 06131-7546
michael.salter@ct.gov

Project: CT DOT Project No. 96-201, Rehabilitation of I-84 Bridge 01218/04180 over Housatonic River in Southbury and Newtown, Connecticut
NDDDB Determination No.: 201800636

Dear Michael Salter,

I have reviewed Natural Diversity Data Base maps and files regarding the area delineated on the map you provided for the proposed CT DOT Project No. 96-201, Rehabilitation of I-84 Bridge 01218/04180 over Housatonic River in Southbury and Newtown, Connecticut. According to our information we have records for State Threatened *Haliaeetus leucocephalus* (bald eagle) and State Special Concern *Terrapene carolina carolina* (eastern box turtle) from the vicinity of this project. Thank you for including the protection strategies and protocols that will be in place to protect these species from project impacts. If these protection strategies are followed then the proposed activities will not have an adverse impact on the bald eagle or box turtle. This determination is good for two years. Please re-submit an NDDDB Request for Review if the scope of work changes or if work has not begun on this project by January 25, 2020.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Natural History Survey and cooperating units of DEEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available. The result of this review does not preclude the possibility that listed species may be encountered on site and that additional action may be necessary to remain in compliance with certain state permits.

Please contact me if you have further questions at (860) 424-3592, or dawn.mckay@ct.gov. Thank you for consulting the Natural Diversity Data Base.

Sincerely,

Dawn M. McKay
Environmental Analyst 3

SECTION 1.10 ENVIRONMENTAL COMPLIANCE

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

Add the following after Required Best Management Practice Number 13:

14. The Contractor is hereby notified that the State listed species of Special Concern eastern box turtle (*Terrapene carolina carolina*), is present within the Project limits. In Connecticut, this terrestrial turtle lives in a variety of habitats, including woodlands, field edges, thickets, marshes, bogs, and stream banks. Typically however, eastern box turtles are found in well-drained forest bottomlands and open deciduous forests. They will use wetland areas at various times during the season. During the hottest part of a summer day, they will wander to find springs and seepages where they can burrow into the moist soil. Eastern box turtles overwinter in upland forest, typically covered by leaf litter or woody debris. As temperatures drop, the turtles burrow down into soft ground.

All construction activities taking place within the Project limits will need to be coordinated with the Office of Environmental Planning (OEP) through the Engineer. At least 10 days prior to the commencement of any construction activities, the Contractor shall, through the Engineer, arrange for a CT DOT Environmental Inspector from the OEP or their authorized delegate to meet and discuss proper protocol for maintaining environmental commitments made for the protection of this species and habitat. OEP will provide oversight through the Engineer to ensure that the following protocols are followed and maintained during the course of the Project.

For any work done during the eastern box turtle's active period (April 1 to October 31) the Department will require the following precautionary measures to protect the eastern box turtle and eastern box turtle habitat:

- a. All areas within the Project limits must be surveyed and cleared of any turtles immediately prior to the commencement of initial clearing and grubbing activities.
- b. All construction personnel working within eastern box turtle habitat must be apprised of the species description and the possible presence of this listed species.
- c. Exclusionary practices will be required in order to prevent any eastern box turtle access to construction areas. These measures will need to be installed at the limits of disturbance as shown on the plans.
- d. Exclusionary fencing shall be at least 20" tall and must be secured to and remain in contact with the ground. It shall be regularly inspected / maintained to prevent any gaps or openings at ground level. Standard silt fence is adequate; fencing with netting shall not be used.

- e. The Contractor must search the work area each morning for the presence of this listed species prior to any work being done.
- f. Any eastern box turtles encountered within the immediate work area shall be carefully moved to an adjacent area outside of the excluded area and the Engineer shall be immediately informed in order to contact OEP with the location.
- g. All staging and storage areas in the vicinity of turtle habitat, outside of previously paved locations, regardless of the duration of time they will be utilized, must be reviewed by and receive written approval from OEP through the Engineer.
- h. No heavy machinery or vehicles may be parked in any unapproved eastern box turtle habitat.
- i. Exclusionary fencing shall be removed when it is no longer needed, and silt fence shall be removed as soon as the area is stable to allow for reptile and amphibian passage to resume.

Work may take place during the eastern box turtle's inactive (hibernation) period (November 1 to March 31) with the following additional precautionary measure:

- a. Exclusionary fencing must be installed and the area inspected for turtles by the Engineer or Engineer's approved representative prior to October 1.

These practices will be applied to the entire Project unless a sketch is attached, which identifies specific areas of concern.

This species is protected by State laws, which prohibit killing, harming, taking, or keeping them in your possession. Photographs and the laws protecting eastern box turtles shall be posted in the Contractor's and DOT field offices (species ID sheets will be provided by OEP).

15. The Contractor is hereby notified that the Bald Eagle (*Haliaeetus leucocephalus*) may be located within the vicinity of this project. The bald eagle is a state threatened species and is also protected under both the Federal Bald and Golden Eagle Protection Act, and the Federal Migratory Bird Treaty Act. The bald eagle has adapted to life in urban settings and is becoming a common visitor in winter, particularly at favored locations along the Connecticut River, Housatonic River, and large lakes/reservoirs. In the winter, bald eagles may congregate into groups called communal winter roosts in order to conserve energy, take advantage of protective habitat, and be closer to food sources. The bald eagle is typically associated with large diameter trees (30 inch DBH or greater) for nest building and roosting purposes. Though somewhat tolerant of human activity, bald eagles can be negatively affected if work is too close to an active nest or winter roost. For this reason, special conditions regarding the location and timing of work around eagle usage areas must be adhered to.

In order to protect this species, construction activities will not be allowed to take place within 600 feet of a confirmed nest or winter roost as follows:

- Bald eagle nesting areas: construction activities will not be allowed to take place within 600 feet of a confirmed nest between February 1st and August 1st.
- Winter roost areas: construction activities will not be allowed to take place within 600 feet of a confirmed winter roost area between December 1st and March 31st.

Construction activities will be allowed within project areas that are outside the 600 foot buffer.

Additionally, the cutting of large trees (30 inch DBH or greater) shall be reviewed and approved by the Engineer in coordination with the Department's Office of Environmental Planning (OEP) staff. Any change in construction sequencing or timing of proposed work in the project area, which might disturb bald eagles must be coordinated through the Engineer.

The time period and approximate areas of the project expected to be subject to these restrictions based on the best available eagle activity information are attached. Prior to the start of work and during the project, areas subject to these restrictions may be updated based on confirmed nest/winter roost information and shall be provided by the OEP. Exact locations of nests/winter roosts will not be provided in order to further protect the species.

The Contractor shall, through the Engineer, at least 10 days prior to the commencement of any construction activities, arrange for a CT DOT Environmental Inspector from the OEP or their authorized delegate to be available to meet and identify the approximate roost and/or nest location as well as discuss proper protocol for maintaining environmental commitments made to the protection of this species and habitat.




This species is protected by State and Federal law which prohibit killing, harming, taking, harassing, or keeping them in your possession. Workers shall be notified of the existence of bald eagles in the area and be apprised of the laws protecting them. Photographs of, and the laws protecting, bald eagles shall be posted in the Contractor's and DOT field offices (species ID sheets will be provided by OEP). Any observations of this species are to be immediately reported to the Engineer.

Natural Diversity Data Base

Areas

SOUTHBURY, CT

June 2019

-  State and Federal Listed Species
-  Critical Habitat
-  Town Boundary

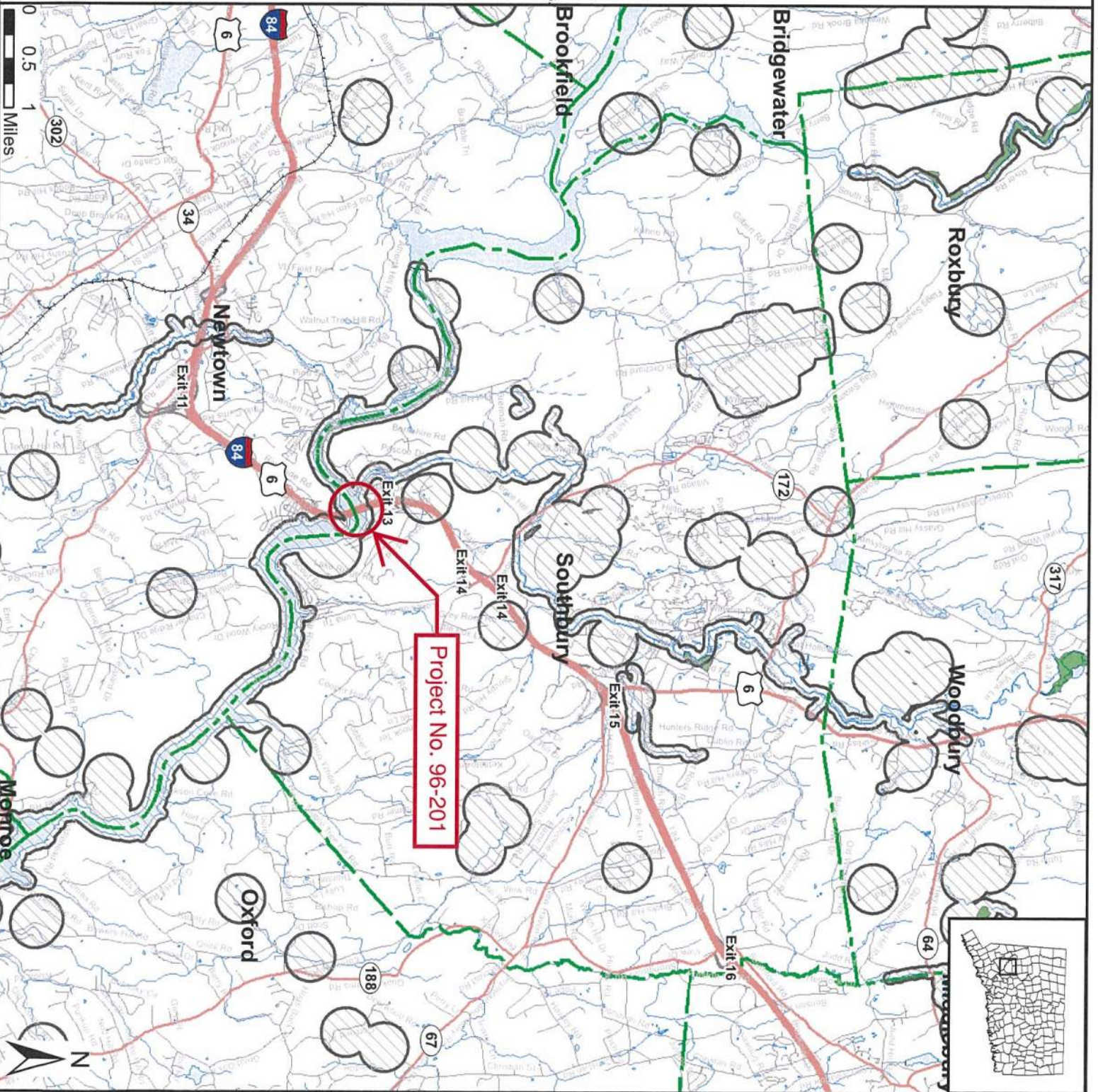
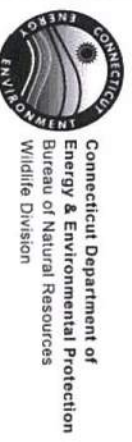
NOTE: This map shows general locations of State and Federal Listed Species and Critical Habitats. Information on listed species is collected and compiled by the Natural Diversity Data Base (NDDDB) from a variety of data sources. Exact locations of species have been buffered to produce the generalized locations.

This map is intended for use as a preliminary screening tool for conducting a Natural Diversity Data Base Review Request. To use the map, locate the project boundaries and any additional affected areas. If the project is within a hatched area there may be a potential conflict with a listed species. For more information, complete a Request for Natural Diversity Data Base State Listed Species Review form (DEP-APP-007), and submit it to the NDDDB along with the required maps and information. More detailed instructions are provided with the request form on our website.

www.ct.gov/deep/nddbrequest

Use the CTECO Interactive Map Viewers at www.cteco.uconn.edu to more precisely search for and locate a site and to view aerial imagery with NDDB Areas.

QUESTIONS: Department of Energy and Environmental Protection (DEEP)
79 Elm St, Hartford, CT 06106
email: deep.nddbrequest@ct.gov
Phone: (860) 424-3011



Attachment F: USACE Self-Verification Application



**US Army Corps
of Engineers**[®]
New England District

Appendix E: Self-Verification Notification Form

This form is required for all **non-tidal projects in Connecticut**, but **not** required if work is done within boundaries of Mashantucket Pequot or Mohegan Tribal Lands. **Before** work commences, complete **all** fields (write "none" if applicable); attach project plans (not required for projects involving the installation of construction mats only); and any state or local approval(s); and send to:

Permits & Enforcement Branch B
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2751
or cenae-r@usace.army.mil

and

CT DEEP
Inland Water Resources Division
79 Elm Street
Hartford, CT 06106-5127

State or local Permit Number: TBD
Date of State or local Permit: TBD
State/local Project Manager: TBD

Permittee: Connecticut Department of Transportation
Address, City, State & Zip: 2800 Berlin Turnpike, Newington, Connecticut 06131
Phone(s) and Email: (860) 594- 2000 kimberly.lesay@ct.gov

Contractor: To Be Determined by Low Bid Process
Address, City, State & Zip: N/A
Phone(s) and Email: N/A

Consultant/Engineer/Designer: CME Associates
Address, City, State & Zip: 101 East River Drive, East Hartford, Connecticut 06108
Phone(s) and Email: (860) 290- 4100

Wetland/Soil Scientist Consultant: CME Associates
Address, City, State & Zip: 101 East River Drive, East Hartford, Connecticut 06108
Phone(s) and Email: (860) 290- 4100

Project Location (provide detailed description & locus map): Project No. 096-201: Bridge No. 01218 carrying Interstate 84 Eastbound and Bridge No. 04180 carrying Interstate 84 Westbound over the Housatonic River. A locus map is attached.

Address, City, State & Zip: I-84 EB and WB Bridges over Housatonic River in Newtown/Southbury, CT 06482/06488

Latitude/Longitude Coordinates: Bridge No. 01218 (I-84 EB) is 41.439137, -73.247516; Bridge No. 04180 (I-84 WB) is 41.438978, -73.247991.

Waterway Name: Housatonic River

Project Purpose (include all aspects of the project including those not within Corps jurisdiction):
The project purpose is intended to repair Bridges No. 01218 and 04180 over the Housatonic River. River. The biennial state inspection revealed that the Bridge No. 01218 super structure is rated poor (4) due primarily to the section losses noted of the floor-beams. Bridge No. 04180 superstructure is rated fair (5) due to section losses, cracked fillet welds, and warped webs of the floorbeams.

Work Description: The project proposes to repair the existing bridge structures. See attached description for additional information.

Work will be done under the following GP(s) (check all that have associated impacts):

None **GP. 2 - Repair or maintenance of authorized or grandfathered structures/fills**

Area of total wetland impacts: temporary _____ SF permanent _____ SF
Area of total waterway impacts: temporary _____ SF permanent _____ SF

None **GP. 5 - Boat ramps/marine railways**

Area of total wetland impacts: temporary _____ SF permanent _____ SF
Area of total waterway impacts: temporary _____ SF permanent _____ SF

None **GP. 6 - Utility line activities (include calculations for each single & complete crossing – attach additional sheet if necessary)**

Area of total wetland impacts: temporary _____ SF permanent _____ SF
Area of total waterway impacts: temporary _____ SF permanent _____ SF

None **GP. 9 - Shoreline and bank stabilization projects**

Area of total wetland impacts: temporary _____ SF permanent _____ SF
Area of total waterway impacts: temporary _____ SF permanent _____ SF

None **GP. 10 - Aquatic habitat restoration, establishment and enhancement activities**

Area of total wetland impacts: temporary _____ SF permanent _____ SF
Area of total waterway impacts: temporary _____ SF permanent _____ SF

None **GP. 11 - Fish & wildlife harvesting, enhancement and attraction devices and activities**

Area of total wetland impacts: temporary _____ SF permanent _____ SF
Area of total waterway impacts: temporary _____ SF permanent _____ SF

None **GP. 12 - Oil Spill and Hazardous material cleanup**

Area of total wetland impacts: temporary _____ SF permanent _____ SF
Area of total waterway impacts: temporary _____ SF permanent _____ SF

None **GP. 13 - Cleanup of hazardous and toxic waste**

Area of total wetland impacts: temporary _____ SF permanent _____ SF
Area of total waterway impacts: temporary _____ SF permanent _____ SF

None **GP. 14 - Scientific measurements devices**

Area of total wetland impacts: temporary _____ SF permanent _____ SF
Area of total waterway impacts: temporary _____ SF permanent _____ SF

None **GP. 15 - Survey activities**

Area of total wetland impacts: temporary _____ SF permanent _____ SF
Area of total waterway impacts: temporary _____ SF permanent _____ SF

None **GP. 17 - New/expanded developments & recreational facilities**

Area of total wetland impacts: temporary _____ SF permanent _____ SF
Area of total waterway impacts: temporary _____ SF permanent _____ SF

None GP. 18 - Linear transportation projects- wetland crossings only (include calculations for each single & complete crossing - attach additional sheet if necessary)

Area of total wetland impacts: temporary _____ SF permanent _____ SF
Area of total waterway impacts: temporary _____ SF permanent _____ SF

x GP. 19 - Stream, river & brook crossings – not including wetland crossings (include calculations for each single & complete crossing – attach additional sheet if necessary)

Area of total wetland impacts: temporary ⁰ _____ SF permanent ⁰ _____ SF
Area of total waterway impacts: temporary ^{2,000} _____ SF permanent ^{1,800} _____ SF

None GP. 21 - Temporary fill not associated with any other GP activities

Area of total wetland impacts: temporary _____ SF permanent _____ SF
Area of total waterway impacts: temporary _____ SF permanent _____ SF

Does your project include any secondary effects? Yes _____ No x

(Secondary effects include, but are not limited to non-tidal waters or wetlands drained, flooded, fragmented, or mechanically cleared resulting from a single and complete project. See Appendix F - Definitions.) If YES, describe here: _____

Proposed Work Dates: Start: Spring 2020 Finish: Fall 2023

Your name/signature below, as permittee, confirms that your project meets the self-verification criteria and that you accept and agree to comply with the applicable terms and conditions in the Connecticut General Permits.

Thomas J. Macjian
Signature of Permittee

10-16-2019
Date

Attachment H: Additional Information
Project Area Photos
Interagency Meeting Notes
CTDEEP Fisheries Coordination
FM General Certification
DEEP Boating Coordination

Attachment H: Project Area Photos

Project Photos



Birdseye aerial of Bridge Nos. 01218 & 04180 I-84 EB and I-84 WB over the Housatonic River looking westward (BingMaps)



Aerial photo of Bridge Nos. 01218 & 04180 and immediate surroundings



Bridge 01218 elevation looking approximately northwards



The edge of the Housatonic River (Lake Zoar) under Bridge 01218. Some areas include stone stabilization and others do not.



Vegetation is dense on the slope between the bridges but minimal in areas shaded by the bridge.



Historic marker at mid-point of Bridge 01218.

Attachment H: Interagency Meeting Notes

Interagency Coordination Meeting Notes

May 18, 2017

DOT Room 3130

134-147 Stafford Modern Roundabout

05/18/2017 – This project involves the installation of a modern roundabout at Route 190 and Route 319 in the Town of Stafford. This project was presented at the project managers meeting on September 15, 2016, where it was determined a site visit with Brian Murphy would be helpful.

Project Impacts: There would be approximately 23,850 sq ft of wetland impacts requiring mitigation by in-lieu fee.

Permitting Requirements: USACE PCN, DEEP PGP, DEEP FMC, DEEP IWGP

Agency Comments: After discussions at the September PMM meeting, the roundabout was shifted south based on recommendation by DEEP, to minimize impacts to functioning wetlands to the north. At this more southerly location, impacts are primarily to a manmade pond. DEEP and OEP commented that the 2 box option, which was discussed at September PMM, was more favorable than a single long box culvert. A site visit was held on May 11, 2017, with OEP and DEEP (Brian Murphy was present) to discuss any fisheries mitigation for 1 box vs 2 box design. DEEP fisheries stated that mitigation would be required for the project using 1 box culvert. No fisheries mitigation required for the 2 box culvert design. The Designer received confirmation that they could go ahead with the 2 box option with in-lieu fee. USACE is also ok with only the wetland in-lieu fee for this project.

Action Items: The design of the watercourse between the two box culverts will incorporate fisheries enhancements.

102-TBD Norwalk River Valley Trail

05/18/2017 – The Norwalk River Valley Trail is a proposed trail to run along Route 7 from Broad Street to Highway 33, and a pedestrian bridge crossing will need to be constructed around the confluence of Norwalk River and Silvermine River. It was pointed out that the FEMA Map is not correct – the bridge is actually 10' above the 100-year flood (likely CLOMR). An overhead high-tension electrical system passes through the area, which may present constructability issues. No NDDB blobs apparent based on latest mapping. Wetlands discussions were based on observation (wetlands not flagged yet).

Designers presented three alternative crossing options for the project (proposed crossings will be by prefabricated truss bridge):

- Option 1 hugs Route 7, and potentially lessens overall wetland impacts to the area. There are less permitting concerns for this option (piers would be in floodway, one in the water, but no impacts to vegetated wetlands). It is closer to the highway and the designer stated it is a less aesthetically pleasing option, as well as there are concerns with safety and maintenance (debris from highway, etc).
- Option 2 uses the existing route of the electrical utility corridor and a combination of boardwalk and bridges to span the crossing of the Norwalk River/Silvermine River confluence.
- Option 3, the "island path option" runs along the top of a narrow "island" in the Silvermine River and also includes boardwalk areas. This option is the least costly and reduces some hydraulic concerns; however, there are wetland impacts and access for maintenance and construction may be more difficult. It was expressed that this is DEEP's preferred option.

Project Impacts: At this point in time, wetlands have not been flagged so there are no solid impact numbers for wetland disturbance.

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Permitting Requirements: CLOMR will probably be required because the FEMA map is so outdated (no matter what option is chosen). DOT is responsible for FM-MOU but the town is responsible for any other permits and the CLOMR.

Agency Comments: H&D and others commented that there may be a previous CLOMR showing changes to FEMA maps from previous projects (Route 7 construction). OEP reminded designers that when wetlands are flagged, state and federal wetlands should be flagged separately. Bob Gilmore explained that DEEP prefers option 3, but that options 1 and 2 do not raise any "red flags".

Action Items: Mike Hogan will check for any indication of FEMA map changes from Hydraulic Reports from previous Route 7 project.

160-150 Bridge 02169, I-84 over Lower Ruby Brook, Willington

05/18/2017 – This project was initially presented at PMM on September 15, 2016. On 12/14/2016, DEEP Fisheries and OEP did a site visit with Brian Murphy. No FEMA flood plain in the area. The existing crossing under I-84 consists of three different culvert types, connected together – twin 6-foot reinforced concrete pipes, a 14-foot x 10-foot concrete box culvert and an 8-foot diameter corrugated metal pipe. The outlet pipe is perched. The proposed design will be a 9-foot diameter reinforced concrete pipe, which will be jacked/microtunnelled approximately 115 feet to the south. 315 feet of entirely new channel for Lower Ruby Brook will be created. The new culvert will be buried 2' for stream bed material placement, include baffles and eliminate the perched outlet. Existing and proposed pipe capacities are good for 500-year storm. Water will flow through existing culverts (water handling during construction) until the new culverts and channel are in place. Work will to be done in one season.

Project Impacts: Wetland impacts are 850 sq ft and watercourse impacts are 425 sq ft. (corrected to approx. 4600 sf)

Permitting Requirements: Anticipated permits are USACE PCN, DEEP PGP 401 WQ certification, DEEP IW General, and DEEP General Stormwater.

Agency Comments: OEP questioned watercourse impacts of only 425 sq ft and asked if that included inside the existing pipes. Designer corrected to approximately 4600 sq ft of impact to the watercourse. Bob Gilmore questioned why this would be permitted as a PCN. He asked if this fell under relocation of a stream and therefore would be an Individual permit. Susan confirmed she felt that it would be a PCN since they were not relocating the natural stream channel.

Action Items:

96-205 Bridge 06720, I-84 over Pole Bridge Brook, Newtown

05/18/2017 – Bridge 06720 is a 500-foot long culvert that conveys Pole Bridge Brook below I-84. The culvert outlets into a buried junction chamber which then drops to a 10-foot box culvert. Designers brought forth three different alternatives. Alternative 1A is rehabilitating the existing corrugated metal pipe. Alternative 1B would be a slip lining. Alternative 1C would be centrifugally cast cementitious lining. All alternatives are anticipated to have the same permitting needs. Designer is recommending Alt 1C even though it's the most expensive option. They anticipate over several weeks of water handling needed, during low flow time of year.

Permitting Requirements: Anticipated permits are PCN, 401 WQ certification, IW General, and General Stormwater.

Agency Comments: OEP questioned whether the channel suggested to be used for temporary water handling would be able to withstand the flows and not be eroded. Designer agreed to take a second look at the proposed channel and confirm it would be able to handle flows moving through. H&D said all work is occurring in Zone X and channelized within the culvert system, therefore a FM is not needed. At

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this point in time, no fish passage is supported through this culvert, and that condition will remain as it is not feasible to provide passage through this culvert.

Action Items:

23-127 Bridge 05222, Town Bridge Road over Farmington River, Canton

05/18/2017 – This is a federal local bridge program project, rehabilitating Bridge 05222, Town Bridge Road over the Farmington River. This bridge was built in 1895 and is one of only two surviving through-truss structures of this type in Connecticut. It is a historic bridge and listed in the National Register of Historic Places. The trusses will be disassembled and rehabilitated off site. This project is located within an AE flood zone and NDDB area. In 2011 coordination with Fisheries was initiated and at that point in time Don Mysling confirmed he had no fisheries concerns. An initial NDDB submission was also completed in 2011.

Project Impacts: None.

Permitting Requirements: None

Agency Comments: There is no in water work and no work on the substructure. No painting will be done on site, and no FM is needed. OEP commented that an updated NDDB submission will be needed as it has been more than two years since the initial submission. Steve Gephard (Fisheries) stated that he had no concerns.

Action Items: Consultant will need to re-submit an NDDB request.

113-107 / 113-108 Bridge 02931 Route 2A over Poquetanuck Cove and Bridge 02932 Route 2A over Dickermans Brook (Hasley Brook)

05/18/2017 – These projects previously came to PMM on December 18, 2014. The proposal for 113-107 is replacement of bridge with a 10 ft. wide by 8 ft. high box culvert to replace a 14' span. Drainage area 0.046 sq. miles; FEMA floodplain throughout. This will have a slightly smaller hydraulic opening, however the low chord remains the same. A 5-foot pipe would be installed for water handling during construction and then would be filled in place once construction is complete.

For 113-108 the proposal is a 25' clear span bridge to replace a 12' span. The low chord would be raised 2' feet. Drainage area 0.79 sq. miles; FEMA floodplain throughout. Three NDDB species identified. Sandbags and sheeting would be used for water handling during 2 stages of construction.

Sites require a 3:1 mitigation due to permanent impacts to tidal wetlands (approx. 0.13 ac of mitigation needed). Previous discussions with DEEP and OEP led to Stoddard Hill Boat Launch being proposed site for mitigation. This would entail 4,182 sq ft of phragmites removal; 2,818 sq ft of native wetland plugs, and possibly improvements to the boat ramp area (currently has crumbling asphalt).

Project Impacts: 113-107 – 0.25 ac of ground disturbance, 350 sq ft permanent impacts and 440 sq ft temporary impact. 113-108 – 0.8 ac of ground disturbance, 1,192 sq ft permanent impact and 380 sq ft temporary impact.

Permitting Requirements: Anticipated permits for these two projects include DEEP Tidal Wetlands Structures, Dredging, and Fill, DEEP FMC,USACE PCN . Additionally OEP needs to coordinate with Coast Guard. Designer noted that projects are using expiring funds (earmarked); planning on submitting permits in 1-1/2 months.

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Agency Comments: DEEP and USACE stated they were okay with proposed mitigation plans. District 1 expressed concerns with cofferdams and existing abutment supports and questioned whether water would infiltrate subsurface during construction. Consultant said Geotech will be investigating and will have comments on what is happening subsurface at the location.

Action Items: Designer to make sure that utilities are shown on plates (specifically, an oil-filled electrical cable left in place.) Susan Lee requested updated plans with a clearer view of mean high tides lines as they were difficult to see on existing plans. She felt that OLISP mitigation was okay; wants to be provided with mitigation plans.

96-201 I-84 Eastbound (Bridge No. 01218) & Westbound (Bridge No. 04180) over the Housatonic River

05/18/2017 – This project involves the rehabilitation of I-84 EB, Bridge No. 01218 and WB Bridge No. 04180, both 4-span continuous steel two girder floor system structures. They are structurally deficient based on deterioration and extensive cracking of floor beams and deck girders and therefore require superstructure replacement. Most of the work will occur in-water. Designer discussed two options for in-water work. Option 1 was a temporary work trestle between the bridge structure, on temporary piles and in place for 4 years (considered a permanent impact). Option 2 is the use of barges between Spans 1, 2, and 3, and creation of a “causeway” in Span 4 (filling in Span 4 under one of the bridges with 2500 CY of fill). Due to dams both upstream and downstream and fluctuations in water levels, coordination with First Light will likely be necessary. Construction will require crossover of traffic for both structures, as well as construction of a temporary pedestrian traffic bridge. OEP will have to coordinate with the Coast Guard and is waiting on more information on trestle and piles in the waterway. OEP commented that tree clearing in the area could potentially be a concern due to the large number of eagles that roost along this stretch of river.

Project Impacts: Approximately 12,930 sq ft of temporary impacts for the project (includes bridge work as well as construction of temporary pedestrian walkway).

Permitting Requirements: Anticipated permits are ACOE 404, DEEP PGP 401 WQ Certification, DEEP FMC, IW General, Stormwater Permit, and coordination with Coast Guard will also be necessary.

Agency Comments:

Action Items: OEP needs more information from designer on the exact number and location of temporary trestle piles in the waterway for permitting purposes and in order to coordinate with the Coast Guard. OEP commented that the flagging of wetlands must be fully completed.

120-93

05/18/2017 – Bridge 02540 carries Route 85 over Little Brook in the Town of Salem. This is presently a single span of 9'-2", concrete slab on stone masonry abutments. Drainage area =1.2 sq. miles; Bankfull width = 8'; FEMA flood zone (Zone A) downstream. OEP and designer had coordinated with Brian Murphy (DEEP Fisheries) and H&D discussing three alternatives for replacement:

- Alternative 1 is replacement with a 12' x 7' concrete box culvert buried 1' for natural streambed material and includes widening of the road for bike lanes and/or future road widening.
- Alternative 2 is replacement with a 12' x 7' precast concrete 3-sided structure on a deep foundation supported by driven piles.
- Alternative 3 is a replacement with a 12.5' x 8' corrugated metal pipe arch structure.

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Designers indicated that Alternative 1 was preferred since it would allow a one season construction (2 week road closure.) They presented Brian Murphy's email (discussed below) as support.

Project Impacts: Impacts were shown graphically and discussed generally (all alternatives expected to be significantly under 5000 sf)

Permitting Requirements: Depends on the alternative selected.

Agency Comments: In previous communications (email Jan. 31, 2017), Brian Murphy commented on the alternatives and stated that a concrete box culvert sunken 1 foot below grade (Alternative 1) would be the most acceptable option at this location, including a low flow channel, and restoring planting of streamside vegetation.

Bob Gilmore from DEEP said a 3-sided structure was his strongest recommendation due to resource and scour concerns. Bob had concerns that a box culvert would become perched over time. Designers agreed to sink the box culvert an additional foot and increase to 2' of streambed material. Steve Gephard of Fisheries stated that a downstream dam had been removed and had thoughts that this reach might now support anadromous fish runs. DOT staff had concerns that with a 3-sided structure both the cost and construction time will go up (maybe 2 seasons with alternating one-way traffic). They questioned why a sunken box culvert option would not be acceptable from a resource perspective.

There was discussion between DEEP and OEP whether this reach of Little Brook is part of the Wild & Scenic River designation. If so, that would include coordination with the National Park Service. Susan asked whether this would make it a PCN or an Individual?

Action Items: Final determination on structure type is required. Determination if Wild and Scenic River Coordination is needed with the National Park Service.

**Follow Up: OEP has initiated coordination with USACE regarding the possible Wild & Scenic River designation of Little Brook.*

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Project 82-312, Bridge 00524, Arrigoni Bridge - Route 66 over the Connecticut River, Middletown/Portland

10/18/2018 – The project consists of superstructure steel repairs/strengthening, spot painting of the superstructure, steel and concrete substructure repairs, approach span deck replacement, and replacement of deteriorated electrical components. The entire bridge will be upgraded to state of good repair. Initial rehab work was done six years ago. For access they plan to use the same method - a platform system that will hang just below the low chord of the structure –there will not be in water work and no work done on the piers. A protective fence will be installed during construction. Three year construction timeframe.

Project Impacts: Currently no impacts. NDDDB shows Falcon/Eagle; specifications will be included in project. There was discussion of a nest on pier 19, but not of these species.

Permitting Requirements: Flood Management General, Coastal Maintenance General Permit (to be completed by OEP). Coordination with the Coast Guard will be required.

Agency Comments: USACE staff commented that if there will be fill in the wetland, then an Army Corps permit would be needed. Mike Hogan (H&D) asked about work occurring in the floodplain (is the access road/lay down area in the floodplain?). As currently shown, the floodplain impacts would qualify for an FM General. There is one area between the two rail lines on the Middletown side that needs to be checked for wetlands. DEEP confirmed the project is eligible for a coastal general permit. The Designer mentioned the potential for “jetting” of the drainage structure at Pier 8 and DEEP questioned whether or not the waters would be captured prior to discharge to the Connecticut River.

Action Items: Consultant is finalizing wetlands assessment to determine if there will be any impacts due to the proposed access road.

Project 96-201, Bridges 01218 & 04180, I-84 over Housatonic River in Newtown/Southbury.

10/18/2018 - This Project previously attended the Interagency Meeting on 5/18/2017. This project consists of the rehabilitation of Bridges 01218 and 04180 that carry I-84 east and westbound over the Housatonic River. Bridge 01218 and 04180 are both 4-span continuous steel two girder floor system structures. On Bridge 01218, there is rust on the steel girders and the deck needs extensive repair. On Bridge 04180 there are cracks in the cantilevered floorbeam and map cracking on the underside of the deck. The proposed work is to replace the superstructure on both structures; lengths/widths match existing. The demolition of the existing superstructure will be done with cranes from a work trestle and barges. The work trestle platform would be above the 100-year flood elevation. There will be new pier caps on all piers on both bridges. Cofferdams and dewatering are required around Pier 3 on Bridge 04180. Proposed low chord elevations will be greater than current low chord. They are proposing to make repairs to south embankment on Bridge 01218 as existing riprap has eroded. The work trestle would be located in Spans 3 and 4, with waterway in that area closed to boat traffic. Barges could be used in Span 1; however, a work trestle could also be used in that area. Span 2 would remain open to boat traffic during the duration of construction. There will be a period of several days that the channel will be completely closed to boat traffic. The Lake Zoar public boat launch has been proposed to be used to launch safety boats and work crews.

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Project Impacts:

NDDDB indicates Eastern Box Turtle and Bald Eagle.

Impacts sq. ft	Wetland	Watercourse	Total
Temporary	0	3457	3457
Permanent	0	1443	1443
Total	0	4900	4900

FEMA impacts C.Y.	cut	fill	net
floodway	800	790	-10
floodplain			

Permitting Requirements: USACE SV, DEEP FMC, Stormwater General Permit. 401 permitting is TBD (potentially Individual 401 from DEEP, see notes below). Project will also require First Light coordination, Coast Guard coordination, and coordination with DEEP Boating.

Agency Comments:

Boating/channel use: Fisheries commented that DEEP Boating will need to be notified / coordinated with regarding the complete closure to boat traffic for certain days during construction. DEEP Fisheries mentioned these days would have to be scheduled well in advance. Fisheries also inquired whether public use of the DEEP boat launch would be compromised – the consultant responded it would still be open for public use as the launch would only be used for safety boats and work crews. District 1 Construction commented that this is a highly recreational area and it is important to minimize the days the channel will be completely closed to recreational boat traffic.

Riprap/haul roads: DEEP asked if placement of rip rap or haul roads would have wetland impacts and designer confirmed that these areas would be outside wetland limits.

USACE/Pier 3/Trestle Piles: The Army Corps asked for clarification on what work is being done at Pier 3. Army Corps requested more information / an elevation view of Pier 3 to show what is happening in terms of excavation and fill. Though it will likely still be an SV, Army Corps requested to see limits of excavation and fill (concrete) and elevation views. Army Corps also commented that the temporary pile supported trestle would not be considered impact– it is a temporary pile supported structure in a non-navigational channel (Non-Section 10 waters). If piles are to be cut and left in-place, this would be considered a permanent impact under Army Corps jurisdiction. There was discussion on whether piles would be cut and buried or completely pulled out (TBD.) On other piers where there will be jacking towers, the temporary structures would not be considered impact under Army Corps jurisdiction. Designer said most permanent impacts are from the piles for the trestle (217 piles).

Soils: DEEP said data from soil testing should be submitted to Remediation Division at DEEP for review as there is a concern for the resuspension of PCBs (if present) from the sediments into the water column when the temporary trestle piles and sheeting for cofferdams are pulled. This information will help determine what type of 401 permit is required.

Action Items:

Soils: Information from soil testing should be submitted to DEEP Remediation Division through

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Environmental Compliance. Pending coordination with DEEP Remediation, the 401 permitting needs will need to be re-evaluated.

Boating: Coordination documents for DEEP boating need to be submitted to OEP.

USACE: Army Corps would like to see elevation views of work being done around Pier 3. The elevation views will need to show excavation and fill limits below OHW.

Project 113-107/108, Bridges 02931 & 02932, Route 2A over Poquetanuck Cove & Dickerman's Brook, Preston 10/18/2018 – This Project previously attended the Interagency Coordination Meeting on 5/18/2017. This project involves the rehabilitation of Bridge 02931 (project 113-107) and Bridge 02932 (project 113-108). The proposed work on both bridges includes superstructure replacement and repairs to abutments and wingwalls. Low chords will be raised 6" and 12" respectively. Drainage areas are 0.046 sq. mi. and 0.79 sq. mi. respectively. NDDDB indicates several species concerns in this area including saltmarsh bulrush, tufted hairgrass, and lilaepsis. There is also an archaeologically sensitive area in the vicinity of Project 113-107. These projects require mitigation. The mitigation site has been determined and includes an area of 4,200 sq feet of phragmites treatment, restoration of the treated area with a native tidal planting plan, as well as improvements to the Stoddard Hill boat launch. Consultant will submit a plan for fisheries sign-off once permit plans are developed.

Project Impacts: The temporary wetland impacts are 14,400 sq feet and permanent 17,100 sq feet – the consultant provided rough estimates of 400 cy cut and 330 cy fill in the floodplain – but expressed these provided numbers need to be updated.

Permitting Requirements: OLSIP Tidal Wetlands, Structures, Dredging and Fill, FM General and USACE PCN.

Agency Comments: Mike Grzywinski from DEEP commented that the mitigation site will be permitted as part of the Tidal Wetlands, Structures, Dredging and Fill and 401 permit, not under the Coastal Maintenance GP, as identified in the presentation. Army Corps commented that a mitigation checklist following the tidal wetland module will need to be prepared as part of the PCN application and the consultant should refer to the USACE mitigation guidance for the planting plan. Army Corps also commented plans should include elevation of temporarily located utilities to show the clearance at the bridge, and add high tide lines to all plans. It was also mentioned there is Coast Guard coordination for this project. A comment was made that an herbicide application permit/license was required for the mitigation site. DOT said there has been communication with Roger Wolfe from DEEP Wildlife Division, WHAMM Unit, and his program will be conducting the phragmites removal at the mitigation site and is aware of all permitting requirements.

Action Items: Make required changes to plans as requested by Army Corps (see comments above). Provide OEP with an updated mitigation plan to facilitate coordination with DEEP Parks and Boating Divisions.

Project 141-154, Bridge 06793 & 06794, I-395 over Little Mountain Brook & Unnamed Brook, Thompson 10/18/2018—This Project attended the Interagency Meeting on 4/21/2016. Both structures are single 72" asphalt-coated corrugated metal pipes in very poor condition under as much as 50' of fill. The proposed rehabilitations will

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utilize a 60" internally corrugated HDPE slip lining for repair. Bridge 06794 currently has no endwalls, which will be installed.

This project was sent to Fisheries and received comments in February 2016 reporting the project has negligible effects on Fisheries resources.

Project Impacts:

For Bridge 06793

Impacts sq. ft	Wetland	Watercourse	Total
Temporary	1,963	536	2,499
Permanent	0	1,635	1,635
Total	1,963	2,171	4,134

For Bridge 06794

Impacts sq. ft	Wetland	Watercourse	Total
Temporary	5,369	1,246	6,615
Permanent	1,402	2,330	3,732
Total	6,771	3,576	10,347

Permitting Requirements: Permits will be submitted separately for each bridge: DEEP IW General, DEEP PGP Addendum, USACE PCN

Agency Comments: In regards to a proposed swale and pipe underneath one of the access roads, DOT staff questioned if providing a traversable swale across the access road made more sense than installing a pipe - the swale being a better option for maintenance purposes. EPA said in-lieu fee would be required for permanent impacts associated with the upstream permanent access road for Bridge 06794 (1,342 sq feet). DEEP commented to provide plans for the restoration areas.

Action Items: The in-lieu fee worksheet and calculation will need to be included in the permit application, as well as a plans for planting/restoration of disturbed areas.

Project 76-222, Bridge 06650, I-384 over Folly Brook, Manchester

10/18/2018 – This Project previously attended the Interagency Meeting on 1/18/2018. The existing structure is a 10-foot diameter asphalt-coated corrugated metal pipe under 25 feet of fill. The pipe conveys Folly Brook into Hop Brook a short distance away. The structure is hydraulically adequate but its invert has numerous perforations and there is settlement of the upstream collar. The pipe will be rehabilitated by installing a cast-in-place concrete invert in the bottom quarter of the pipe. New concrete wingwalls will be constructed at the inlet and outlet. The pipe length will be reduced from 362 feet to 288 feet; shortening the pipe at the outlet provides 50' of new watercourse channel and can possibly improve the angle that Folly Brook enters Hop Brook. Baffles will be installed within the rehabilitated culvert per request from Fisheries. Design is considering open cutting I-384 to

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replace existing drainage roadway pipes to allow for 2-year flow and to bypass pump Folly Brook through that structure.

Project Impacts: No NDDDB concerns. FEMA mapping depicts the 100-year floodplain and floodway through the pipe.

Impacts sq. ft	Wetland	Watercourse	Total
Temporary	100	600	700
Permanent	0	5,200	5,200
Total	100	5,800	5,900

Permitting Requirements: DEEP FMC, DEEP GP Addendum, DEEP IW General, USACE PCN

Agency Comments: Two baffle-style alternatives were presented with perpendicular baffles being acceptable to DEEP Fisheries. Fisheries staff will need to know water depths during low flow conditions and the water depth within the baffles. DEEP IW staff want to see a detailed planting plan. OEP staff noted a previous project, which used a by-pass pipe to lift flow up to another culvert.

Action Items: OEP will send designer the project number where this water handling technique was done. Designer to determine water depths at low-flow with the baffles installed.

Project 59-164, US Route 1 & CT Route 22, Guilford

10/18/2018 – The proposed project will construct a modern 3-legged roundabout to replace the existing T-intersection. Construction of the roundabout will improve safety and efficiency for all modes of traffic. There is a potential historic property in the northwest quadrant of the project location (a historical well). Wetland/watercourse impacts are proposed at an existing drainage outlet and channel that goes into Kneuer Pond. This area falls within 100-year floodplain in one small area (zone A) but the drainage area to that point is less than one square mile. There are no Fisheries concerns or NDDDB concerns.

Project Impacts:

Impacts sq. ft	Wetland	Watercourse	Total
Temporary	713	187	900
Permanent	278	147	425
Total	991	334	1,325

FEMA impacts C.Y.	cut	fill	net
floodway			
floodplain	86	36	-50

Permitting Requirements: USACE SV, DEEP IW General, Stormwater Permit.

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Agency Comments: DEEP H&D commented the drainage area is less than 1 sq mile so no Flood Management permit is needed. USACE stated that the historic resources are outside their agency's jurisdictional area, therefore, this project is eligible for an USACE SV even if there are impacts to the historical property.

Action Items: No action items identified.

Project 53-190, Putnam Bridge Trail Connections, Wethersfield/Glastonbury

10/18/2018 – The project attended the Interagency Meeting on 12/21/2017. The project proposes a new 4,750-foot long shared use path connecting the Putnam Bridge walkway between Great Meadow Road in Wethersfield and Niantic Avenue in Glastonbury. In Wethersfield the path starts at the intersection of I-91 exit 25 off-ramp and Great Meadows Road and utilizes the existing walkway on the Putnam Bridge over the river. This project is presented again because the hydraulic analysis has been completed and designers wanted to present the final project design to DEEP.

Project Impacts: This project has 590 sq feet of Federal wetland impact (USACE), and 15,700 sq feet of State wetland impact (DEEP).

Permitting Requirements: USACE SV GP 19, Individual IW Permit (because of state wetland impacts on Glastonbury side), Individual FMC. At a previous meeting, DEEP agreed there was no need for an Exemption, as long as the Town provides written support.

Agency Comments: Some Fiberglass panels on the Putnam Bridge walkway are damaged; Mike Grzywinski said that if a previous permit that included fiberglass panel work is good for 5 years, he can process the extension request for that permit. Bob asked if state wetlands were non-hydric floodplain soils, OEP confirmed. Susan (USACE) and Susan (DEEP) both inquired about elevation over Keeny Cove / how this area will be handled. Mike Hogan from H&D has prepared a hydraulic analysis which indicates that there is no adverse effect due to the loss of flood storage. Municipal Floodplain regulations were discussed briefly. Typically a project requires a Flood Management Exemption if it does not meet town zoning regulation requirements for compensatory flood storage/conveyance. DEEP may not require an exemption if the town provides a letter supporting that the project will not have an adverse impact. DEEP makes the final decision on if an exemption will be required in association with the submitted Individual FMC. Based on the proposed impacts the project would not be eligible for an IWGP and would require an Individual Inland Wetlands and Watercourses permit. DEEP indicated that no mitigation will be required for the state-only wetland impacts.

Action Items: Coordinate extension request from OLISP (permit is still good until 2020). Designer to obtain support letter from Town regarding Town Flood Management requirement for DEEP to alleviate the need for an exemption.

Project 105-209, Bridge 02708 & 01386, Route 154 over Plum Bank Creek & Back River, Old Saybrook

10/18/2018 - The project attended the Interagency Meeting on 1/18/2018. The project proposes to replace the existing bridges with a single span structures comprised of pre-stressed concrete box beams integral with concrete

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abutments, wingwalls, and decks. To protect the bridges from scour the project proposes permanent sheet piling around the new piles. Most of the conversation centered around the proposed mitigation. The projects are going to be separated into different construction contracts so they will have separate permits. Bridge 02708 is going to construction first, Bridge 01386 is under further review by a coastal engineer to address concerns from nearby Homeowners Association (following the coastal engineering assessment, the bridge design may be revisited, and the span could increase, thereby increasing proposed impacts). Current mitigation proposal is acquisition of 1-acre parcel at the mouth of Ragged Rock Creek. This mitigation proposal is for both bridges. The parcel is surrounded by ~250 acres of preserved land (comprised of state, The Nature Conservancy, and Old Saybrook Land Trust). DOT would like to ultimately transfer the 1 acre parcel to DEEP or the Land Trust to be maintained in perpetuity. The mitigation parcel provides a mitigation ratio of approximately 15.9:1 on the impacts for both bridges combined.

Project 105-209 Impacts:

Bridge 02708	Permanent	Temporary	Total
Impacts below HTL	1,225	615	1,840
Impacts below MHW	70	20	90
Total	1,295	635	1,930

Bridge 01386	Permanent	Temporary	Total
Impacts below HTL	1,360	615	1,975
Impacts below MHW	70	20	90
Total	1,430	635	2,065

Total permanent impacts below HTL: 2,585 sq feet

Total permanent impact below MHW: 140 sq feet

Total temporary: 1,270 sq feet

Permitting Requirements: Separately for each bridge - USACE PCN, OLISP Tidal Structures, Dredging and Fill

Agency Comments: USACE asked to clarify if this could be an in-lieu fee project – DOT commented that in-lieu fee would meet the USACE mitigation requirements but that DEEP would not accept in-lieu fee as suitable mitigation for this project and therefore DOT is seeking a single mitigation measure to meet both agency needs. It is DEEP’s position that the mitigation proposal is suitable for impacts as they have been calculated to date for both bridges. It is also their position that if a change in span length on Bridge 01386 causes an increase in impacts, that no additional mitigation would be required. EPA was supportive of the mitigation proposal because the parcel will be able to be managed in the future if acquired, which it will not be if left in private hands. DEEP Fisheries indicated that Ragged Rock Creek Wildlife Area is a state designated waterfowl hunting area, and that preservation of the parcel would allow additional access to marsh for hunters, given its position at the mouth of Ragged Rock Creek. Bob Gilmore was also supportive of the mitigation. There was a discussion regarding the future “development threat” pressure on the

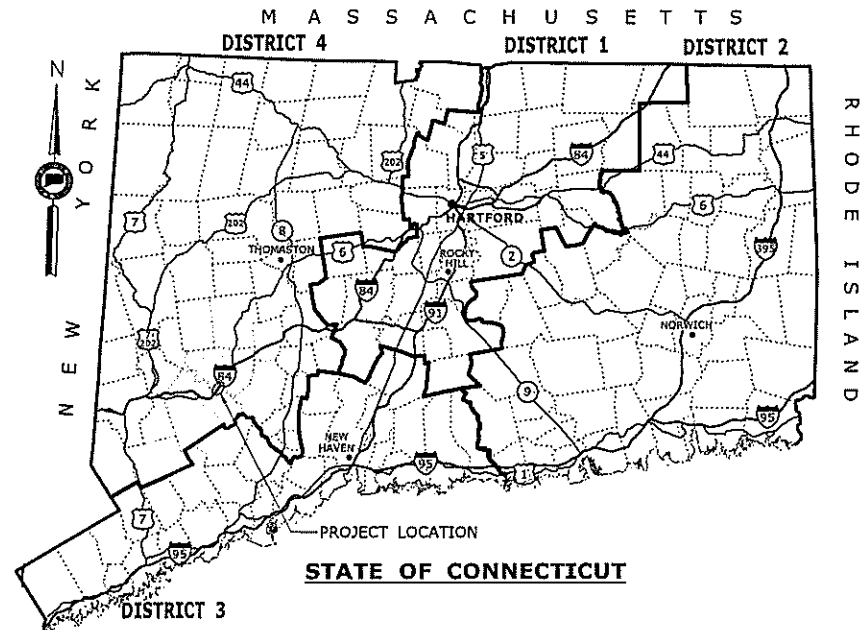
**DEEP/USACE/EPA/DOT
Interagency Coordination Meeting
Project Meeting Agenda – 10/18/2018**

mitigation parcel (or the lack thereof). Bob Gilmore indicated that in-lieu fee monies are being awarded to other projects which the proposed preserve lands are not under development pressure.

Action Items: DOT to return to the Interagency Meeting for Bridge 01386 to report if, at the conclusion of the coastal engineering assessment, the design will be changed and if there are any additional wetland impacts.

Attachment H: CTDEEP Fisheries Coordination

ENVIRONMENTAL PERMIT PLANS STATE PROJECT NO. 0096-0201 REHABILITATION OF BRIDGE NOS. 01218 AND 04180 IN THE TOWNS OF NEWTOWN AND SOUTHBURY



GENERAL NOTES:

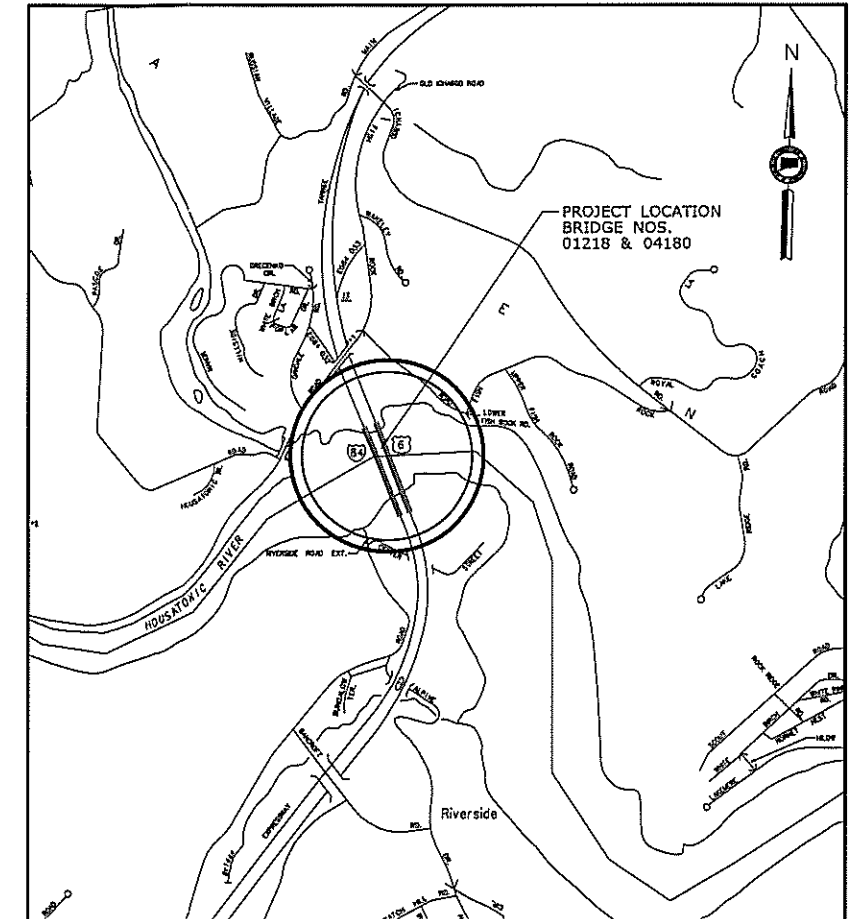
1. THESE PLANS ARE INTENDED ONLY FOR ENVIRONMENTAL PERMITTING PURPOSES. THESE PLANS HOLD AUTHORITY FOR ALL ACTIVITIES CONCERNING THE REGULATED AREA. FOR DETAILED PLANIMETRIC INFORMATION AND PAYMENT REFER TO THE APPLICABLE CONTRACT DOCUMENTS.
2. THE DEPARTMENT OF TRANSPORTATION WILL ONLY SUBMIT REVISIONS 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 NAD 1927 VERTICAL DATUM BASED ON NAVD 1988.
5. ALL CONSTRUCTION ACTIVITIES WILL BE CONDUCTED IN ACCORDANCE WITH THE DEPARTMENT'S STANDARD SPECIFICATIONS FOR ROADS, BRIDGE AND INCIDENTAL CONSTRUCTION, FORM 817, SECTION 1.10 AND WILL ALSO FOLLOW REQUIRED BEST MANAGEMENT PRACTICES (BMPs) AND SEDIMENT AND EROSION CONTROL MEASURES IN ACCORDANCE WITH THE 2002 EROSION & SEDIMENTATION CONTROL GUIDELINES AND THE 2004 STORMWATER QUALITY MANUAL.

Steve Cephal

CTDEEP/Fisheries
October 10, 2019

PERMIT PLANS INDEX OF DRAWINGS

DRAWING NUMBER	DRAWING TITLE
PMT-01	INDEX OF DRAWINGS
PMT-02	GENERAL SITE PLAN
PMT-03	GENERAL SITE PLAN BRIDGE NO. 04180 AND 01218
PMT-04	WETLAND / WATERCOURSE IMPACT PLAN
PMT-05	100 YEAR FLOOD IMPACT PLAN
PMT-06	I-84 WB PIER 3 CUT / FILL LIMITS
PMT-07	CONSTRUCTION STAGING - 1
PMT-08	CONSTRUCTION STAGING - 2
PMT-09	CONSTRUCTION STAGING - 3
PMT-10	CONSTRUCTION STAGING - 4 AND 5
PMT-11	TEMPORARY TRESTLE DETAILS 1
PMT-12	TEMPORARY TRESTLE DETAILS 2
PMT-13	TEMPORARY NAVIGATION LIGHTING / BOAT SAFETY PLAN



LOCATION PLAN
1"=300'

DESIGNED BY:
LOUIS BERGER US
A WSP COMPANY
55 CAPITAL BOULEVARD
ROCKY HILL, CT 06067

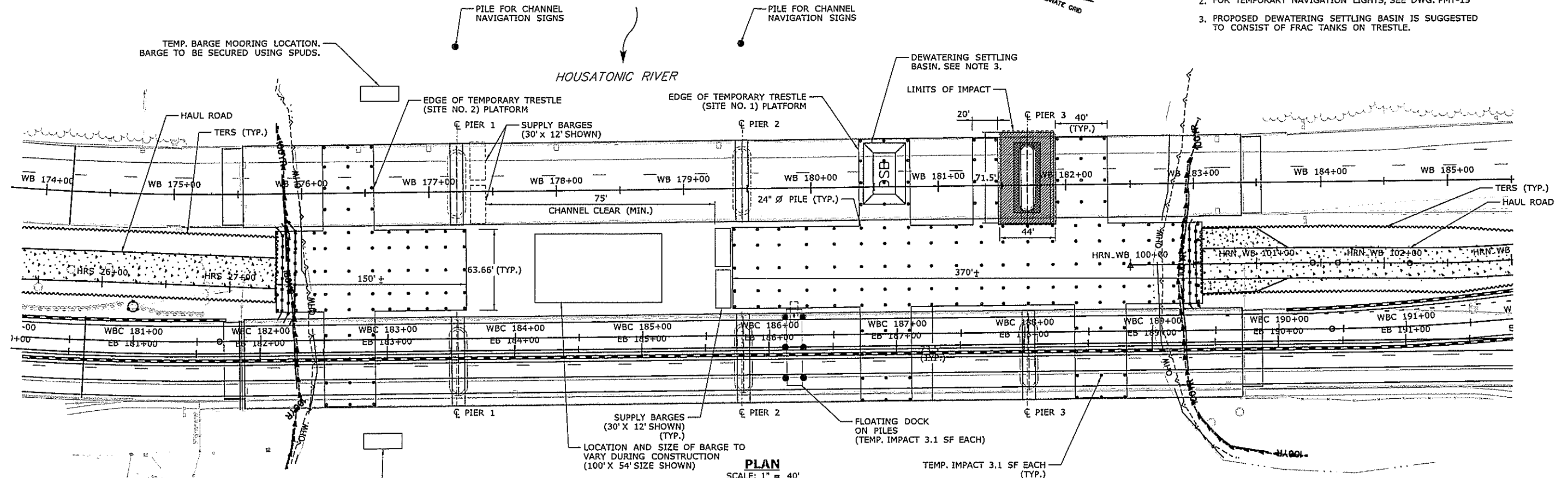
Shaun Suehr
2019.08.16
09:08:28-04'00'

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 8/15/2019

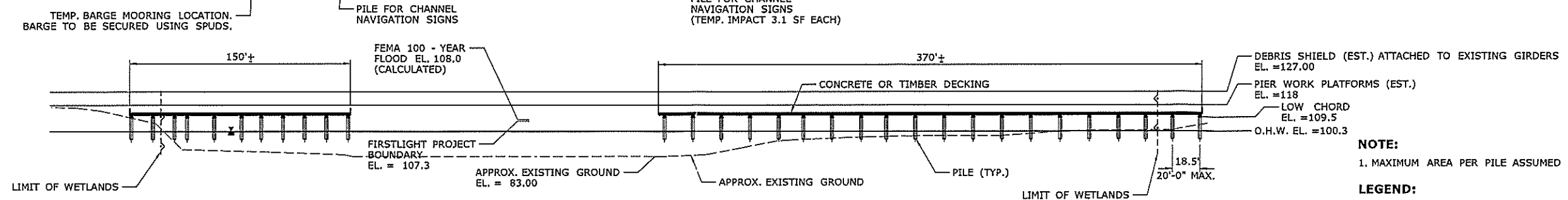
<p>THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.</p>	<p>DESIGNER/DRAFTER: AJM</p> <p>CHECKED BY: JPM</p> <p>SCALE AS NOTED</p>	<p>STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION</p>	<p>SIGNATURE/BLOCK:</p> <p>LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067</p>	<p>PROJECT TITLE: REHABILITATION OF BRIDGE NOS. 01218 AND 04180 I-84 OVER HOUSATONIC RIVER</p>	<p>TOWN: NEWTOWN/SOUTHBURY</p> <p>DRAWING TITLE: INDEX OF DRAWINGS</p>	<p>PROJECT NO. 0096-0201</p> <p>DRAWING NO. PMT-01</p> <p>SHEET NO. 01.01</p>								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV.</th> <th>DATE</th> <th>REVISION DESCRIPTION</th> <th>SHEET NO.</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <p>Plotted Date: 8/15/2019</p>	REV.	DATE	REVISION DESCRIPTION	SHEET NO.										
REV.	DATE	REVISION DESCRIPTION	SHEET NO.											

NOTES:

1. THE CONTRACTOR SHALL NOT WORK WITHIN THE LIMITS OF THE WETLANDS AND WATERCOURSE WITH THE EXCEPTION OF THOSE AREAS DELINEATED AS TEMPORARY OR PERMANENT IMPACTS TO THE WETLANDS AND WATERCOURSE. ALL DISTURBED AREAS SHALL BE RESTORED TO PRECONSTRUCTION CONDITION.
2. FOR TEMPORARY NAVIGATION LIGHTS, SEE DWG. PMT-15
3. PROPOSED DEWATERING SETTLING BASIN IS SUGGESTED TO CONSIST OF FRAC TANKS ON TRESTLE.



PLAN
SCALE: 1" = 40'



ELEVATION
SCALE: 1" = 40'

WETLAND IMPACT TABLE			
	WETLAND IMPACTS SF (ACRES)	WATERWAY IMPACTS SF (ACRES)	TOTAL SF (ACRES)
PERMANENT IMPACTS	0 SF	600 SF (0.01)	600 SF (0.01)
TEMPORARY IMPACTS	0 SF (0.00)	2800 SF (0.06)	2800 SF (0.06)
TOTAL IMPACTS	0 SF (0.00)	3400 SF (0.08)	3400 SF (0.08)

NOTE:

1. MAXIMUM AREA PER PILE ASSUMED IS 3.1 SF.

LEGEND:

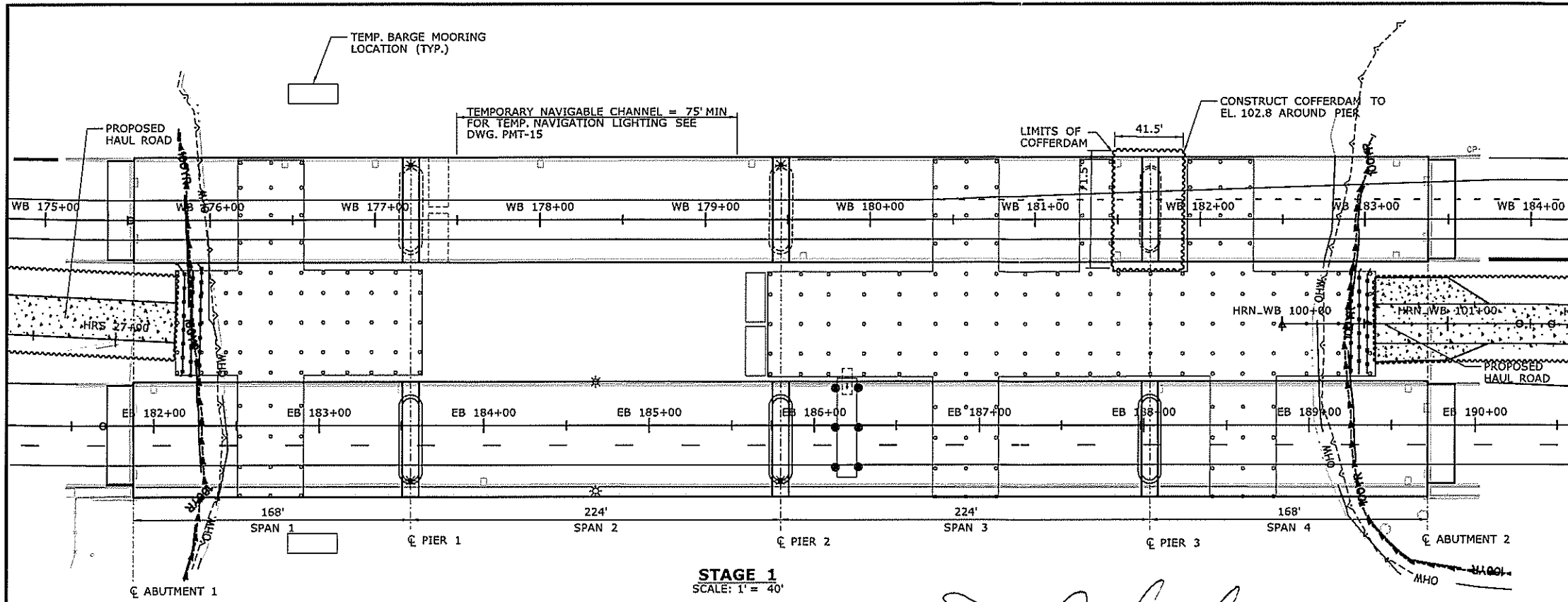
- TEMPORARY IMPACT
- PERMANENT IMPACT
- 100YR - FEMA 100-YEAR FLOOD (CALCULATED)
- OHW - ORDINARY HIGH WATER
- FIRSTLIGHT PROJECT BOUNDARY
- STATE/FEDERAL WETLANDS
- SEDIMENTATION CONTROL SYSTEM (SCS)
- TEMPORARY EARTH RETAINING SYSTEM (TERS)

Steve Cephal

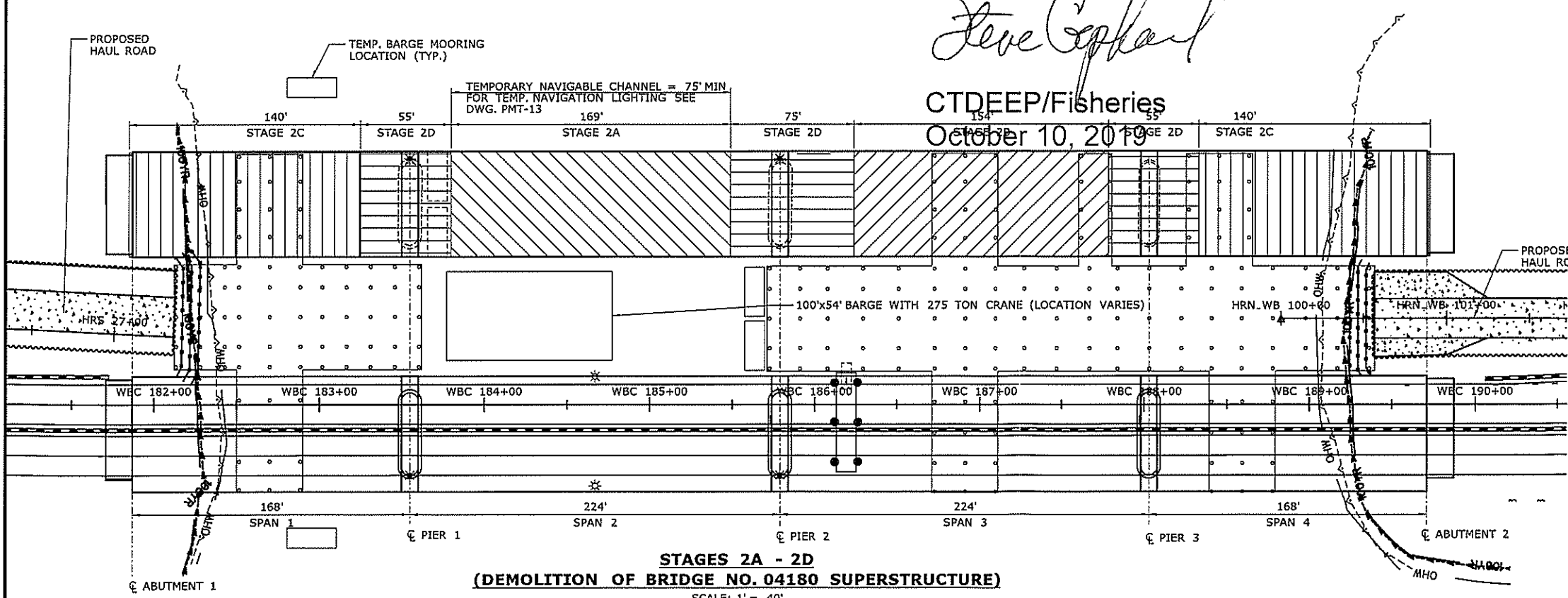
CTDEEP/Fisheries
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ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 8/15/2019

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REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 8/16/2019	Filename: ..._SB_HSTL_0096_0201_PMT-04.dgn		



STAGE 1
SCALE: 1" = 40'



STAGES 2A - 2D
(DEMOLITION OF BRIDGE NO. 04180 SUPERSTRUCTURE)
SCALE: 1" = 40'

NOTES:

- CONTRACTOR BARGES AND WORK BOATS TO BE TIED OFF OR ANCHORED WITH SPUDS IN SPANS 1 & 3 WHEN NOT IN USE.
- STAGE 1 - SUGGESTED CONSTRUCTION SEQUENCE:**
- INSTALL SEDIMENTATION CONTROL SYSTEM.
 - CONSTRUCT HAUL ROADS IN APPROACHES.
 - DRIVE PILES AND BUILD TEMPORARY TRESTLES AND CONSTRUCT A COFFERDAM AROUND PIER 3. CONSTRUCTION OF TEMPORARY TRESTLES SHALL BE FROM BARGES OR OTHER FLOATED PLATFORMS. THE CONTRACTOR SHALL NOT LAUNCH BARGES FROM STATE OWNED BOAT LAUNCH.
 - PLACE SIGNS AND CHANNEL MARKERS TO DELINEATE TEMPORARY CHANNEL FOR BOAT TRAFFIC. BLOCKAGE OF NAVIGATION CHANNEL FOR DEMOLITION AND CONSTRUCTION SHALL REQUIRE THE PRIOR WRITTEN PERMISSION OF THE ENGINEER.
 - CONSTRUCT CROSSOVER ROADWAY IN MEDIAN AND TEMPORARY ROAD CLOSURES FOR IN ROAD PREP WORK FOR CROSSOVER.

STAGE 2A - SUGGESTED CONSTRUCTION SEQUENCE:

- INSTALL DEBRIS SHIELD
 - REMOVE PARAPETS, DECK, STRINGERS, AND FLOORBEAM CANTILEVERS FROM ALL OF SPANS.
 - INSTALL TEMPORARY SUPPORTS/BRACING AT PIER 1 AND PIER 2 TO PROVIDE ADDITIONAL SUPPORTS FOR PRIMARY GIRDERS.
 - REMOVE FLOORBEAMS AND LATERAL BRACING FROM CENTER OF SPAN IN AREA INDICATED.
 - REMOVE MID-SPAN SECTION OF MAIN GIRDERS IN AREA INDICATED.
- NOTE: ESTIMATED DURATION OF NAVIGATION CHANNEL BLOCKAGE IS ONE (1) DAY.

STAGE 2B - SUGGESTED CONSTRUCTION SEQUENCE:

- INSTALL TEMPORARY SUPPORTS AT PIER TO PROVIDE ADDITIONAL SUPPORTS FOR CANTILEVERS.
- REMOVE FLOORBEAMS, AND LATERAL BRACING FROM CENTER OF SPAN AS INDICATED.
- REMOVE MID-SPAN SECTION OF MAIN GIRDERS AS INDICATED.

STAGE 2C - SUGGESTED CONSTRUCTION SEQUENCE:

- REMOVE FLOORBEAMS AND LATERAL BRACING FROM END OF SPANS AS INDICATED.
- REMOVE END SECTION OF MAIN GIRDERS AS INDICATED.

STAGE 2D - SUGGESTED CONSTRUCTION SEQUENCE:

- INSTALL TEMPORARY BRACING TO STABILIZE MAIN GIRDERS DURING FLOORBEAM AND LATERAL BRACING REMOVAL.
 - REMOVE REMAINING FLOORBEAMS, AND LATERAL BRACING.
 - REMOVE REMAINING SECTIONS OF MAIN GIRDERS.
- NOTE: NAVIGATION CHANNEL SHALL BE CLOSED TO BOAT TRAFFIC DURING DURATION OF STEEL PICKS WITHIN SPAN 2. ESTIMATED DURATION = 2 DAYS.

LEGEND:

⊛	GREEN NAVIGATIONAL LIGHT	
⊛	RED NAVIGATIONAL LIGHT	
— 100YR —	FEMA 100-YEAR FLOOD (CALCULATED)	
— OHW —	ORDINARY HIGH WATER	
— — —	FIRSTLIGHT PROJECT BOUNDARY	
— — —	STATE/FEDERAL WETLANDS	
— — —	SEDIMENTATION CONTROL SYSTEM (SCS)	
— — —	TEMPORARY EARTH RETAINING SYSTEM (TERS)	

TEMPORARY HYDRAULIC DATA	
AVERAGE DAILY FLOW (CFS)	2,500 ¹
AVERAGE SPRING FLOW (CFS)	5,000 ¹
2-YEAR FREQUENCY DISCHARGE (CFS)	20,000 ²
TEMPORARY DESIGN DISCHARGE (CFS)	20,000
TEMPORARY DESIGN FREQUENCY (YRS)	2
TEMPORARY WATER SURFACE ELEV (FT) - UPSTREAM	100 ³
TEMPORARY WATER SURFACE ELEV (FT) - DOWNSTREAM	100 ³

NOTE: ELEVATIONS PROVIDED ARE REFERENCED TO NAVD88 DATUM.
¹ CALCULATED AS PER CTDOT DRAINAGE MANUAL SEC. 6.16 BASED ON DRAINAGE AREA.
² TRANSFERRED FROM GAGE NO. 01205500 ON HOUSATONIC RIVER.
³ NORMAL POOL ELEVATION DUE TO DOWNSTREAM STEVENSON DAM (CORRESPONDING TO PROJ. 96-115 AS-BUILT PLANS AND 2013 FAIRFIELD CO. FIS).

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 8/15/2019

REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 8/15/2019

DESIGNER/DRAFTER: AJM
 CHECKED BY: JPM
 SCALE AS NOTED

STATE OF CONNECTICUT
 DEPARTMENT OF TRANSPORTATION

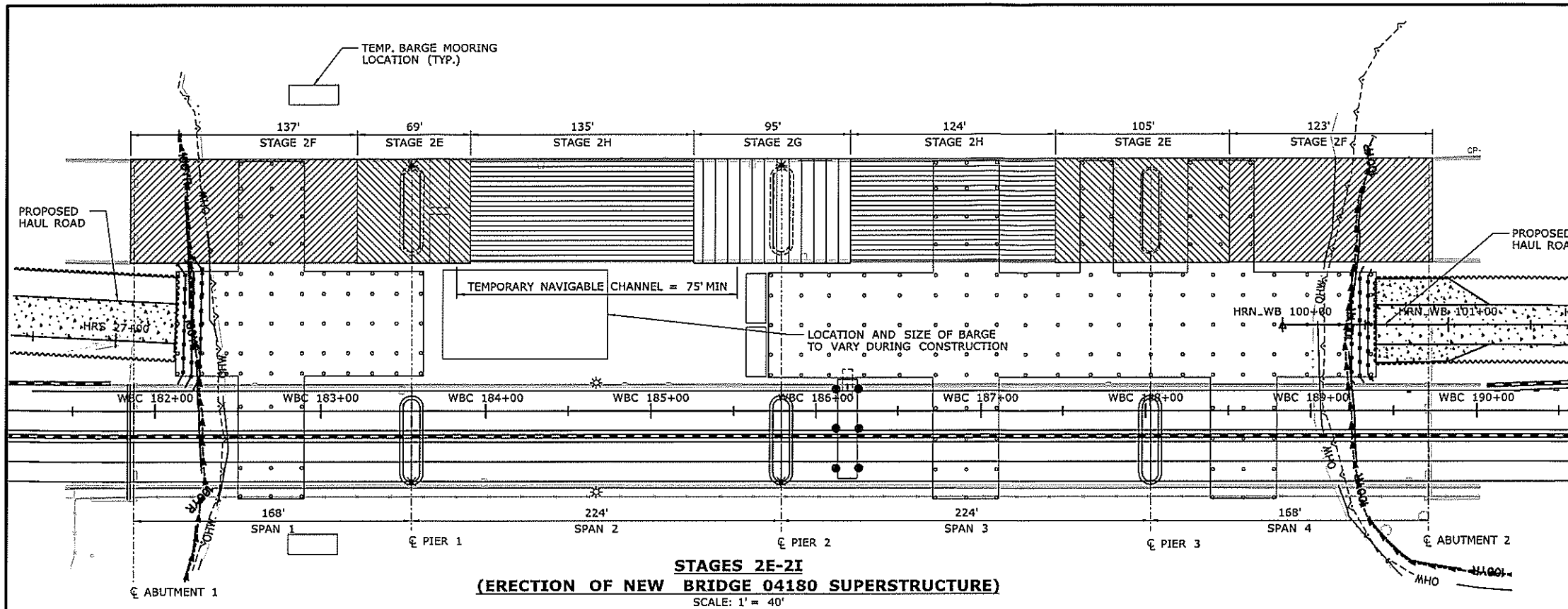
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 A WSP COMPANY
 55 CAPITAL BOULEVARD
 ROCKY HILL, CT 06067

PROJECT TITLE:
**REHABILITATION OF BRIDGE NOS
 01218 & 04180- I-84 EB/WB
 OVER HOUSATONIC RIVER**

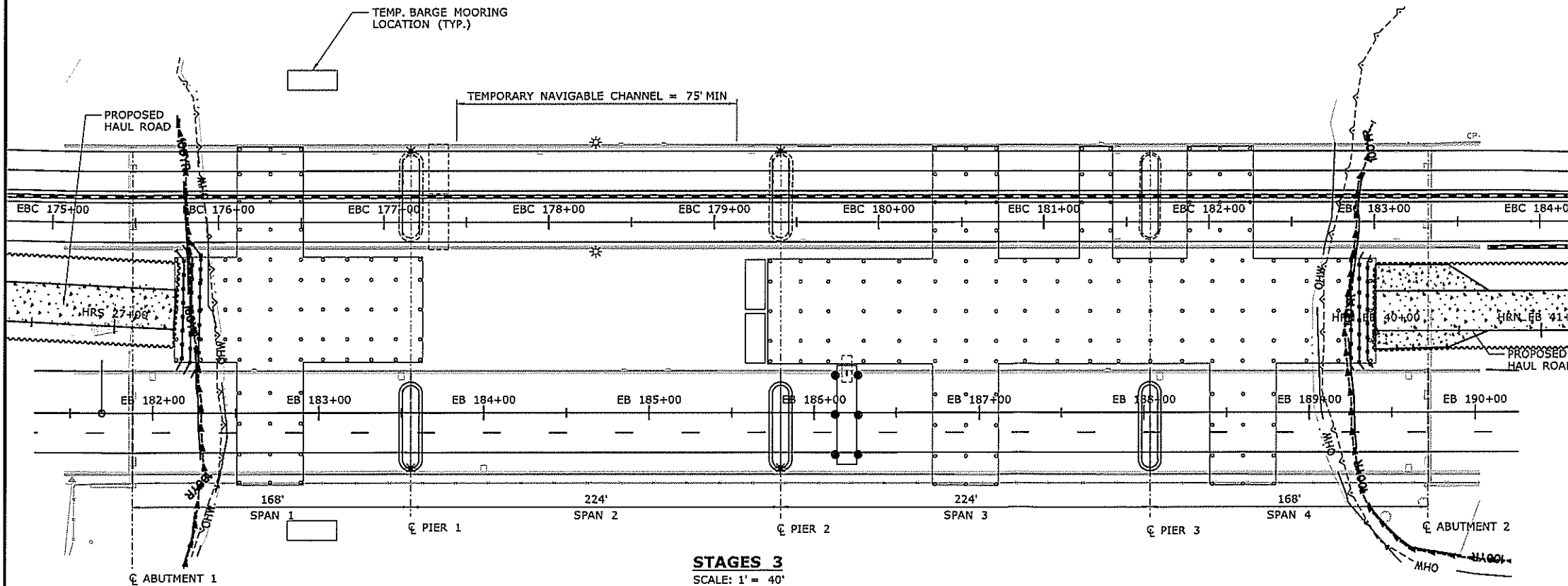
TOWN: **NEWTOWN/SOUTHBURY**

DRAWING TITLE:
**CONSTRUCTION
 STAGING - 1**

PROJECT NO.: **96-201**
 DRAWING NO.: **PMT-07**
 SHEET NO.: **01.07**



**STAGES 2E-2I
(ERECTION OF NEW BRIDGE 04180 SUPERSTRUCTURE)**
SCALE: 1" = 40'



STAGES 3
SCALE: 1" = 40'

- NOTES:**
- CONTRACTOR BARGES AND WORK BOATS TO BE TIED OFF OR ANCHORED WITH SPUDS IN SPANS 1 & 3 WHEN NOT IN USE.

- STAGE 2E - SUGGESTED CONSTRUCTION SEQUENCE:**
- COMPLETE SUBSTRUCTURE REPAIRS TO PIERS AND ABUTMENTS FROM TRESTLE, FINGERS AND/OR BARGES.
 - COMPLETE MODIFICATIONS OF ABUTMENTS AND PIERS (INCLUDES COLLAR CONSTRUCTION AT PIER 3).
 - INSTALL PROPOSED GIRDERS OVER PIER 1 AND PIER 3.
 - INSTALL DIAPHRAGMS AND LATERAL BRACING.

- STAGE 2F - SUGGESTED CONSTRUCTION SEQUENCE:**
- INSTALL END GIRDER SECTIONS IN SPAN 1 AND SPAN 4 AND SPLICE WITH PREVIOUSLY INSTALLED SECTIONS OVER PIER 1 AND PIER 3, RESPECTIVELY.
 - INSTALL DIAPHRAGMS AND LATERAL BRACING IN SPAN 1 AND SPAN 4.

- STAGE 2G - SUGGESTED CONSTRUCTION SEQUENCE:**
- INSTALL PROPOSED GIRDERS OVER PIER 2 AND TEMPORARILY SUPPORT CANTILEVERS.
 - INSTALL DIAPHRAGMS AND LATERAL BRACING.

- STAGE 2H - SUGGESTED CONSTRUCTION SEQUENCE:**
- INSTALL REMAINING MID-SPAN GIRDER SECTIONS IN SPAN 2 AND SPAN 3 AND SPLICE WITH PREVIOUSLY INSTALLED SECTIONS OVER PIER 1, PIER 2, AND PIER 3, RESPECTIVELY.
 - INSTALL ALL REMAINING DIAPHRAGMS AND LATERAL BRACING.

- STAGE 2I - SUGGESTED CONSTRUCTION SEQUENCE:**
- REMOVE TEMPORARY SUPPORTS AT ALL PIERS.
 - BACKFILL WORK AREA AT PIER 3 COLLAR WITH NATURAL STREAMBED MATERIAL.
 - REMOVE COFFERDAM FROM PIER 3. CUT SHEETING A MINIMUM OF 1' BELOW MUDLINE.
 - INSTALL PROPOSED DECK AND PARAPETS.

NOTE: NAVIGATION CHANNEL SHALL BE CLOSED FOR DURATION OF STEEL PICKS OCCURRING IN SPAN 2 DURING ANY STAGE. ESTIMATED DURATION = 3 DAYS.

- STAGE 3 - SUGGESTED CONSTRUCTION SEQUENCE:**
- REMOVE CROSSOVER ROADWAY IN MEDIAN AND RE-ROUTE TRAFFIC TO NEW BRIDGE.
 - CONSTRUCT NEW CROSSOVER ROADWAY IN MEDIAN AND TEMPORARY ROAD CLOSURES FOR IN ROAD PREP WORK FOR CROSSOVER.
 - CLOSE EASTBOUND BRIDGE AND RE-ROUTE TRAFFIC OVER CROSSOVER TO NEW BRIDGE.
 - REMOVAL OF EXISTING TEMPORARY GREEN NAVIGATION LIGHT ON EXISTING EASTBOUND BRIDGE AND INSTALLATION OF TEMPORARY GREEN NAVIGATION LIGHT ON NEW WESTBOUND BRIDGE.

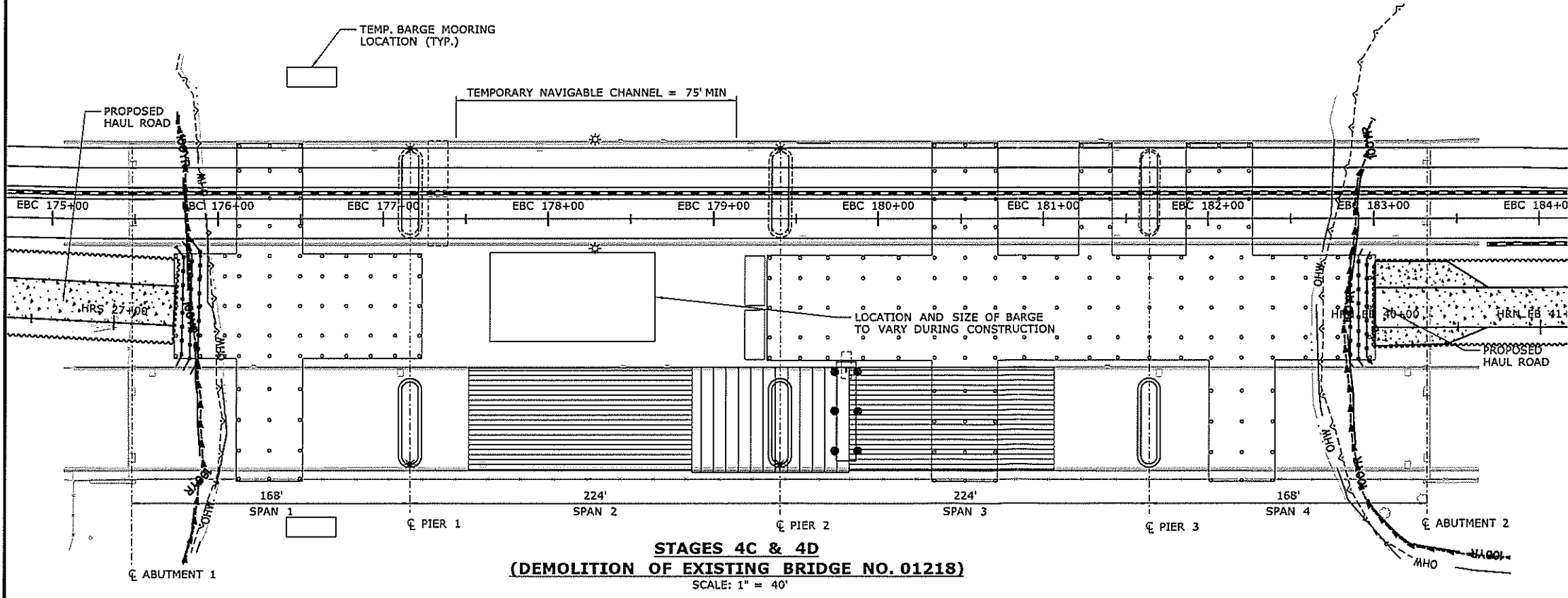
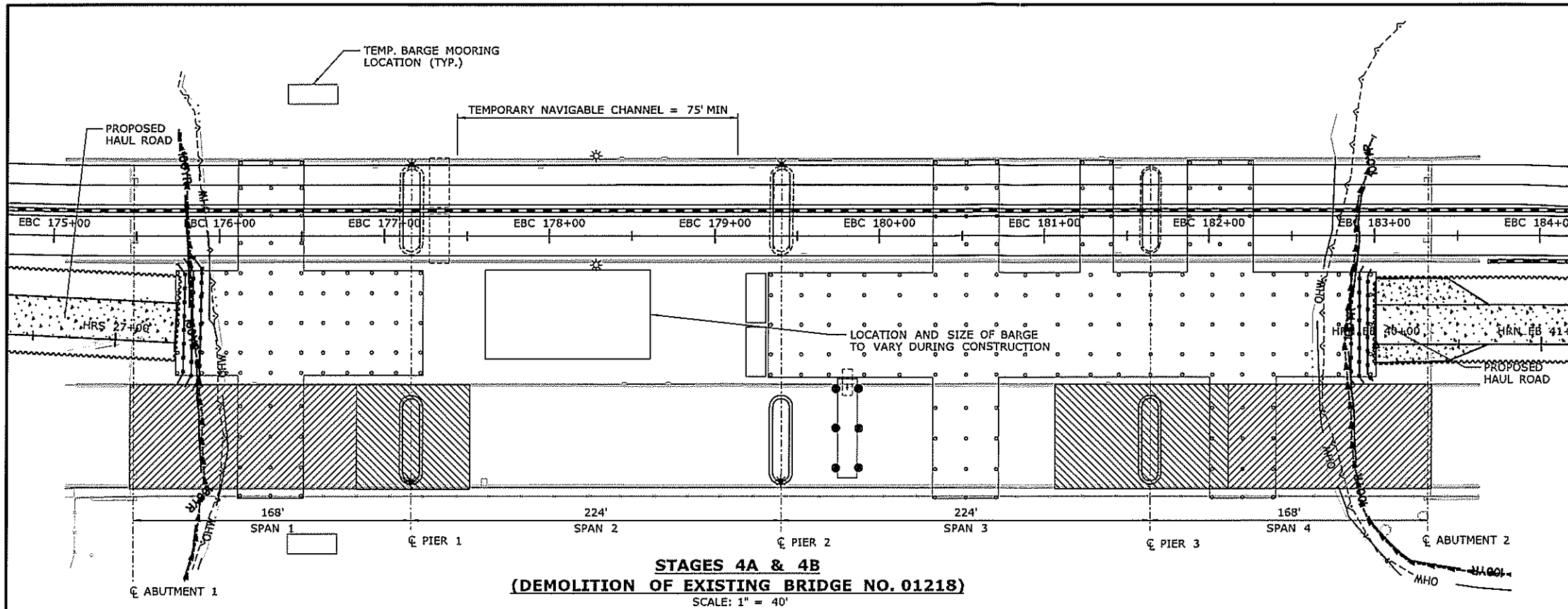
- LEGEND:**
- * GREEN NAVIGATIONAL LIGHT
 - * RED NAVIGATIONAL LIGHT
 - FEMA 100-YEAR FLOOD (CALCULATED)
 - OHW --- ORDINARY HIGH WATER
 - FIRSTLIGHT PROJECT BOUNDARY
 - STATE/FEDERAL WETLANDS
 - SEDIMENTATION CONTROL SYSTEM (SCS)
 - TEMPORARY EARTH RETAINING SYSTEM (TERS)

Steve Cephal

CTDEEP/Fisheries
October 10, 2019

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 8/15/2019

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REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 8/15/2019	DRAWING TITLE: CONSTRUCTION STAGING - 2	DRAWING NO. PMT-08	SHEET NO. 01.08



NOTES:

1. CONTRACTOR BARGES AND WORK BOATS TO BE TIED OFF OR ANCHORED WITH SPUDS IN SPANS 1 & 3 WHEN NOT IN USE.
- STAGE 4A - SUGGESTED CONSTRUCTION SEQUENCE:**
1. INSTALL DEBRIS SHIELD
 2. REMOVE PARAPETS, DECK, STRINGERS, AND FLOORBEAM CANTILEVERS FROM ALL SPANS.
 3. INSTALL TEMPORARY SUPPORTS/BRACING AT PIERS 1 AND 2 TO PROVIDE ADDITIONAL SUPPORTS FOR PRIMARY GIRDERS.
 4. REMOVE FLOORBEAMS AND LATERAL BRACING FROM CENTER OF SPAN IN AREA INDICATED.
 5. REMOVE MID-SPAN SECTION OF MAIN GIRDERS IN AREA INDICATED.
- STAGE 4B - SUGGESTED CONSTRUCTION SEQUENCE:**
1. INSTALL TEMPORARY SUPPORTS AT PIER 3 TO PROVIDE ADDITIONAL SUPPORTS FOR CANTILEVERS.
 2. REMOVE FLOORBEAMS AND LATERAL BRACING FROM CENTER OF SPAN AS INDICATED.
 3. REMOVE MID-SPAN SECTION OF MAIN GIRDERS AS INDICATED.
- STAGE 4C - SUGGESTED CONSTRUCTION SEQUENCE:**
1. INSTALL PROPOSED GIRDERS OVER PIER 2 AND TEMPORARILY SUPPORT CANTILEVERS.
 2. INSTALL DIAPHRAGMS AND LATERAL BRACING.
- STAGE 4D - SUGGESTED CONSTRUCTION SEQUENCE:**
1. INSTALL REMAINING MID-SPAN GIRDER SECTIONS IN SPAN 2 AND SPAN 3 AND SPLICE WITH PREVIOUSLY INSTALLED SECTIONS OVER PIER 1, PIER 2, AND PIER 3, RESPECTIVELY.
 2. INSTALL ALL REMAINING DIAPHRAGMS AND LATERAL BRACING.

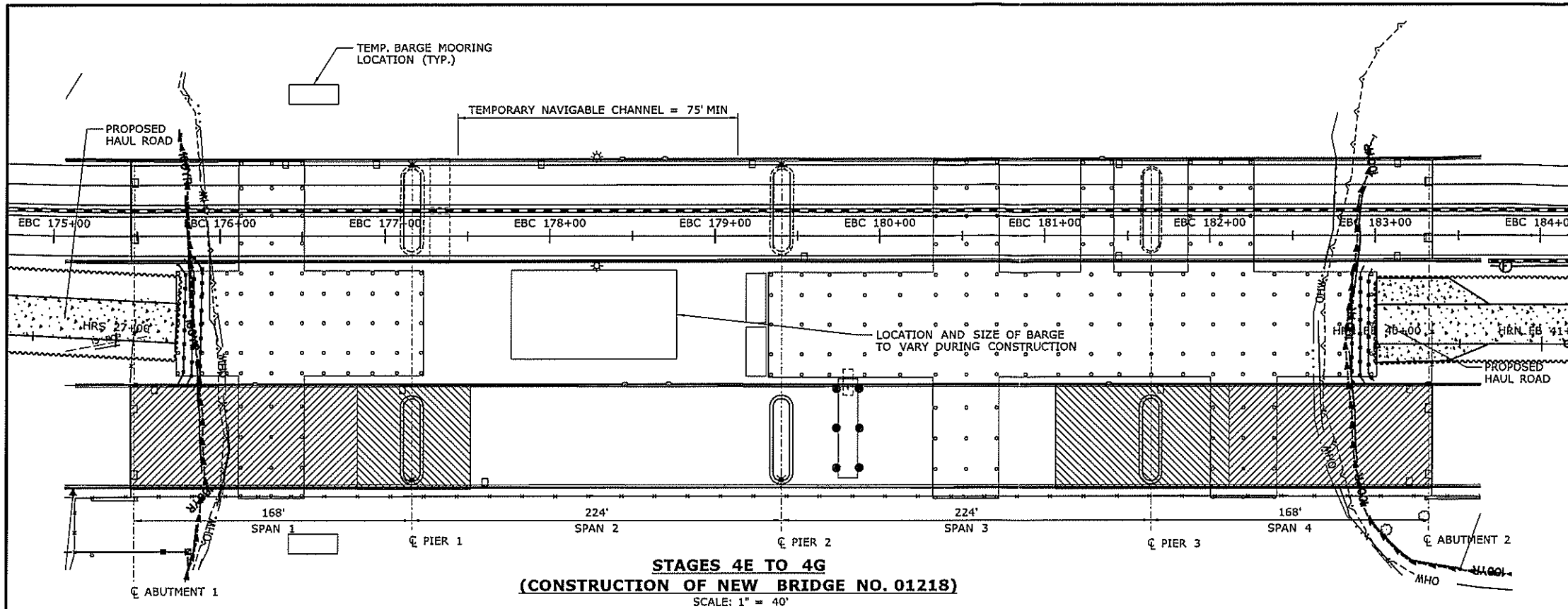
LEGEND:

- ☆ GREEN NAVIGATIONAL LIGHT
 - ✱ RED NAVIGATIONAL LIGHT
 - 100YR - FEMA 100-YEAR FLOOD (CALCULATED)
 - OHW - ORDINARY HIGH WATER
 - FIRSTLIGHT PROJECT BOUNDARY
 - - - STATE/FEDERAL WETLANDS
 - - - SEDIMENTATION CONTROL SYSTEM (SCS)
 - - - TEMPORARY EARTH RETAINING SYSTEM (TERS)
- STAGE 4A
 - STAGE 4B
 - STAGE 4C
 - STAGE 4D

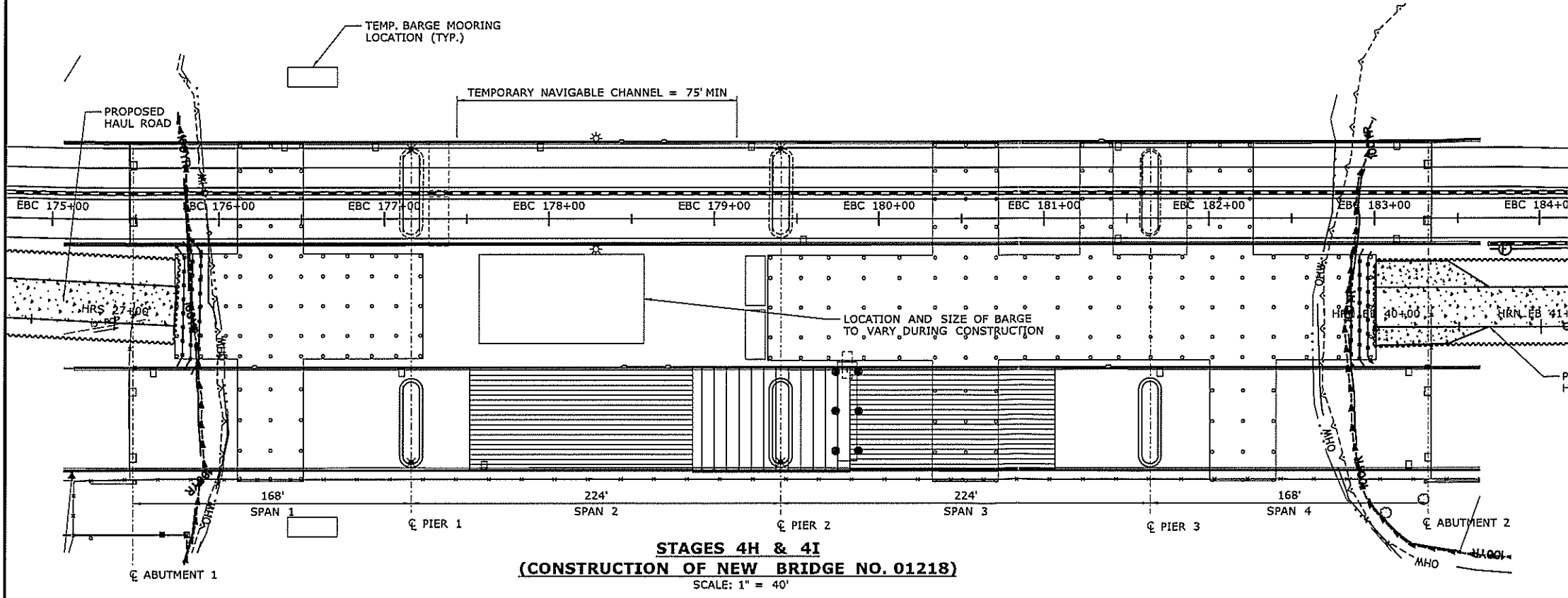
Steve Cephal
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PLAN DATE: 8/15/2019

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REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 8/15/2019	Filename: ...\\SB_HSTL_0096_0201_PMT-09.dgn				



STAGES 4E TO 4G
(CONSTRUCTION OF NEW BRIDGE NO. 01218)
 SCALE: 1" = 40'



STAGES 4H & 4I
(CONSTRUCTION OF NEW BRIDGE NO. 01218)
 SCALE: 1" = 40'

- STAGE 4E - SUGGESTED CONSTRUCTION SEQUENCE:**
1. CONSTRUCT NEW PIER CAPS.
 2. CONSTRUCTION OF THE EXISTING ABUTMENT MODIFICATIONS.
- STAGE 4F - SUGGESTED CONSTRUCTION SEQUENCE:**
1. CONSTRUCTION OF NEW DECK IN AREA INDICATED.
- STAGE 4G - SUGGESTED CONSTRUCTION SEQUENCE:**
1. CONSTRUCTION OF NEW DECK IN AREA INDICATED.
- STAGE 4H - SUGGESTED CONSTRUCTION SEQUENCE:**
1. CONSTRUCTION OF NEW DECK IN AREA INDICATED.
- STAGE 4I - SUGGESTED CONSTRUCTION SEQUENCE:**
1. CONSTRUCTION OF NEW DECK IN AREA INDICATED.
 2. CONSTRUCTION OF NEW PARAPETS, SUPERSTRUCTURE AND MISC. REMAINING ITEMS.
 3. REMOVAL OF THE DEBRIS SHIELD.
- STAGE 5 - SUGGESTED CONSTRUCTION SEQUENCE:**
1. REMOVE TEMPORARY M&PT AND RESTORE TRAFFIC PATTERN.
 2. REMOVE ALL TEMPORARY TRESTLE PILES.
 3. REMOVE TEMPORARY TRESTLE AND HAUL ROAD.
 4. REMOVE CROSSOVER AND RESTORE MEDIAN. ESTABLISH NEW TURF IN MEDIAN ON ALL DISTURBED AREAS.
 5. REMOVAL OF TEMPORARY BOATING SIGNS AND BUOYS.
 6. PROJECT CLOSEOUT ITEMS.

LEGEND:

- GREEN NAVIGATIONAL LIGHT
- RED NAVIGATIONAL LIGHT
- FEMA 100-YEAR FLOOD (CALCULATED)
- ORDINARY HIGH WATER
- FIRSTLIGHT PROJECT BOUNDARY
- STATE/FEDERAL WETLANDS
- SEDIMENTATION CONTROL SYSTEM (SCS)
- TEMPORARY EARTH RETAINING SYSTEM (TERS)

- STAGE 4F
- STAGE 4G
- STAGE 4H
- STAGE 4I

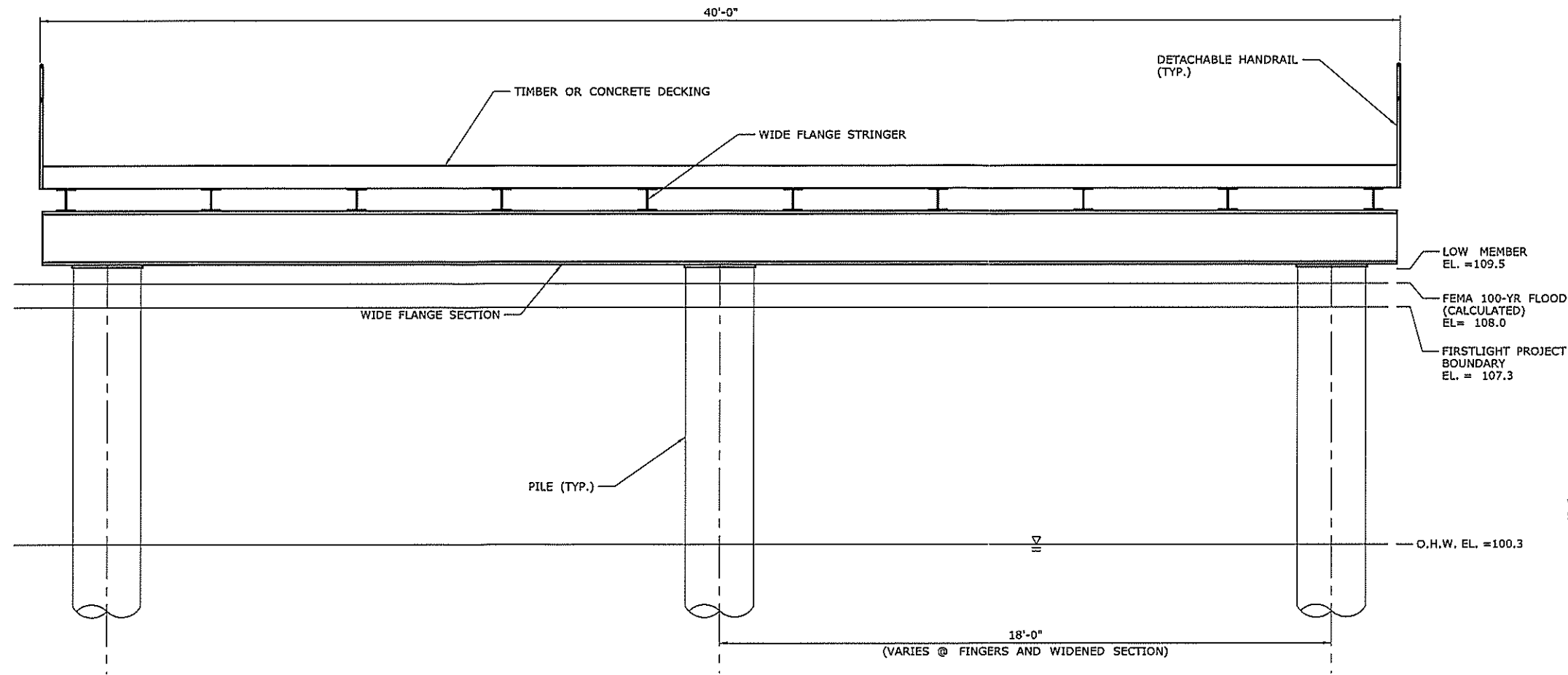
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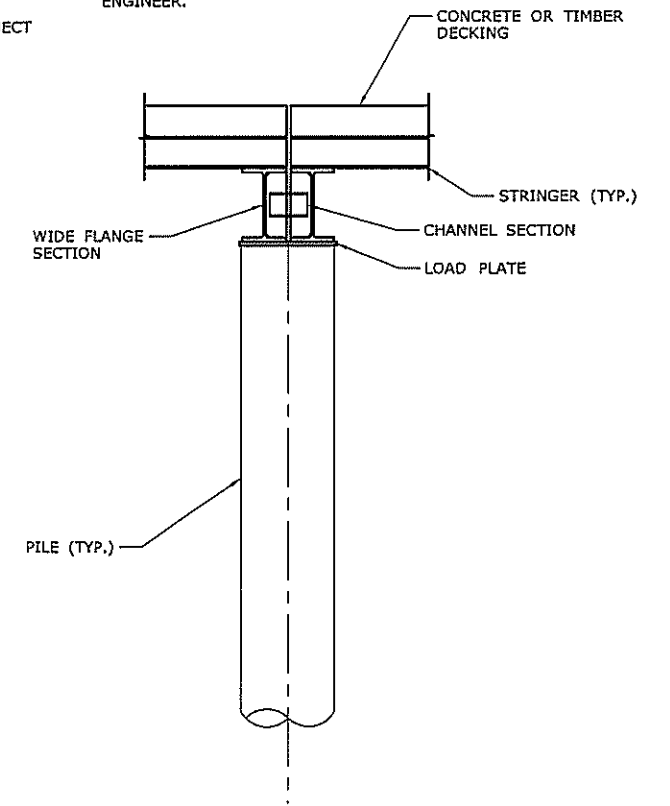
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REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 8/15/2019		

NOTES:

1. TEMPORARY TRESTLE AND FALSEWORK SHALL BE DESIGNED BY THE CONTRACTOR IN ACCORDANCE WITH THE AASHTO GUIDE DESIGN SPECIFICATIONS FOR BRIDGE TEMPORARY WORKS 1ST EDITION, 1995 WITH LATEST REVISIONS TO SUIT THE MEANS AND METHODS USED FOR CONSTRUCTION. THE CONTRACTOR'S DESIGN SHALL HAVE A LOW CHORD ELEVATION ABOVE THE FEMA 100-YR FLOOD ELEVATION OF 108.0 FEET.
2. TEMPORARY PILES INSTALLED IN THE VICINITY OF THE EXISTING BRIDGE FOUNDATIONS SHALL BE LOCATED TO AVOID POTENTIAL CONFLICTS WITH EXISTING PILES AND OTHER OBSTRUCTIONS.
3. ALL TEMPORARY PILE SHALL BE REMOVED DURING TRESTLE REMOVAL. ANY PILES THAT ARE NOT ABLE TO BE REMOVED SHALL BE BACKFILLED WITH CRUSHED STONE AND CUT 1' BELOW THE MUDLINE.
4. THE DESIGN AND CONSTRUCTION OF TEMPORARY WORK TRESTLE, CRANE MATS, FLOATING DOCKS SHALL BE PAID FOR UNDER ITEM NO. 05021XXA "TEMPORARY TRESTLE (SITE NO.X)". SEE SPECIAL PROVISIONS.
5. CONSTRUCTION OF TEMPORARY TRESTLE SHALL BE PERFORMED FROM BARGES, OTHER FLOATED PLATFORMS, OR THE SHORE.
6. THE INFORMATION SHOWN ON THIS DRAWING, INCLUDING (AS APPLICABLE) SIZES OF MEMBERS, THE SEQUENCE OF CONSTRUCTION, AND ERECTION PROCEDURES CONVEYS THE ASSUMPTIONS MADE BY THE DESIGNER IN DESIGNING THE STRUCTURE, AND IS FOR INFORMATIONAL USE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SELECTING THE MEANS AND METHODS FOR CONSTRUCTION. THE CONTRACTOR SHALL ALSO SUBMIT INFORMATION INCLUDING DESIGN CALCULATIONS, CONSTRUCTION SCHEMATICS, AND CONSTRUCTION SEQUENCES AND PROCEDURES TO THE ENGINEER FOR REVIEW.
7. CONTRACTOR IS HEREBY NOTIFIED THAT ALL TEMPORARY WORKS AND EQUIPMENT SHALL MEET THE REQUIREMENTS OF APPLICABLE U.S. COAST GUARD AND CT DEEP BOATING REGULATIONS AND THE REQUIREMENTS OF THE BOAT SAFETY PLAN. SEE DWG PMT-13 FOR BOAT SAFETY PLAN.
8. BARGES DOCKED OR ANCHORED AT TRESTLE IN SPAN 2 SHALL NOT EXCEED 60' X 100'. MINIMUM CLEAR CHANNEL AS INDICATED ON THE PLANS SHALL BE MAINTAINED AT ALL TIMES UNLESS OTHERWISE APPROVED BY THE ENGINEER.





SECTION THROUGH MAIN TRESTLE
SCALE: 1/2" = 1'-0"



SECTION PILE BENT
SCALE: 1/2" = 1'-0"

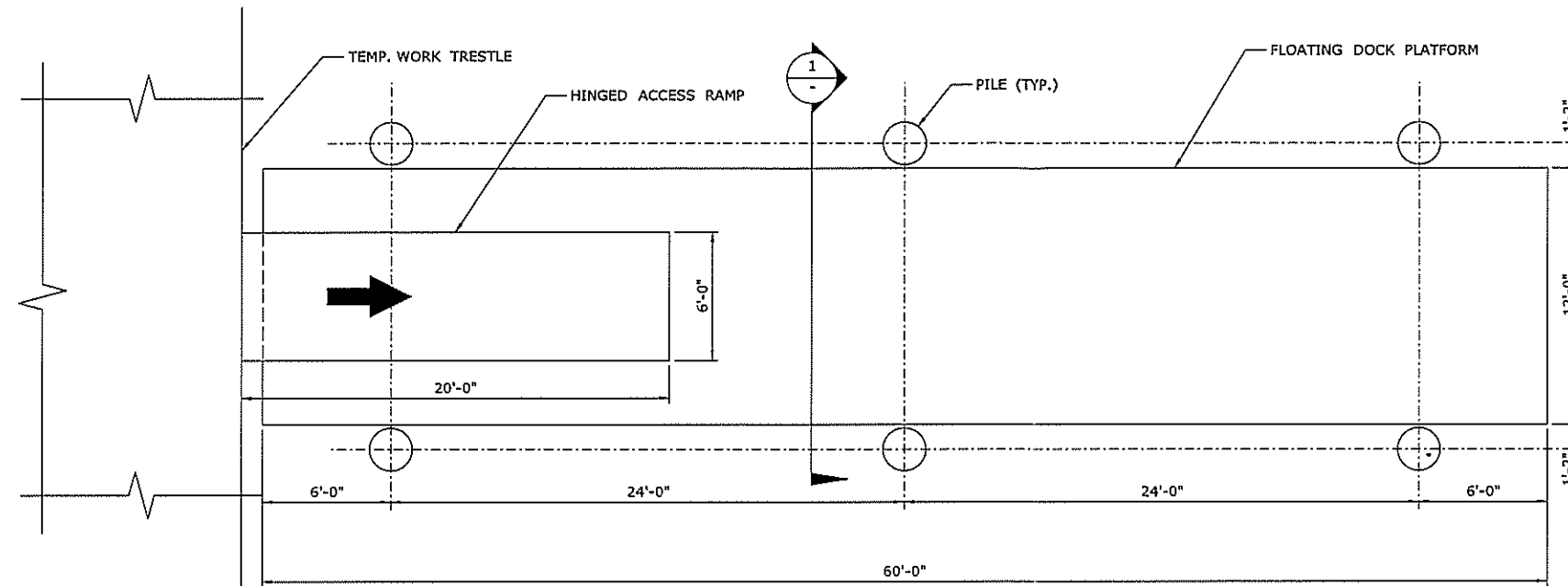
Steve Cephal
CTDEEP/Fisheries
October 10, 2019

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 8/15/2019

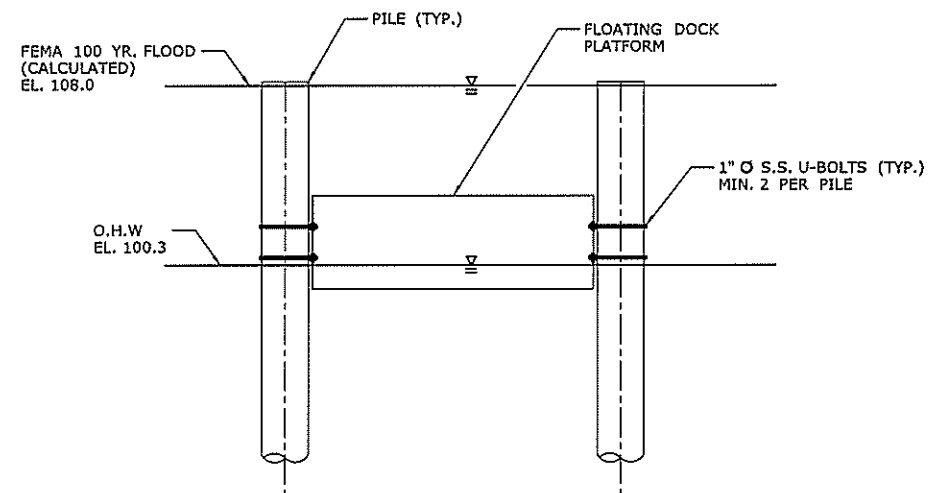
THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.		DESIGNER/DRAFTER: JPM CHECKED BY: JS SCALE AS NOTED	 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION Filename: ...LSB_HSTL_0096_0201_PMT-11.dgn	SIGNATURE/BLOCK:  LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067	PROJECT TITLE: REHABILITATION OF BRIDGE NO 01218/04180 - I-84 OVER HOUSATONIC RIVER	TOWN: NEWTOWN/SOUTHBURY	PROJECT NO. 96-201 DRAWING NO. PMT-11 SHEET NO. 01.11	
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 8/15/2019				

NOTES:

1. SEE DWG. PMT-11 FOR TRESTLE NOTES.



FLOATING DOCK PLAN
SCALE: 1/4" = 1'-0"



1 SECTION
SCALE: 1/2" = 1'-0"

Steve Cephal

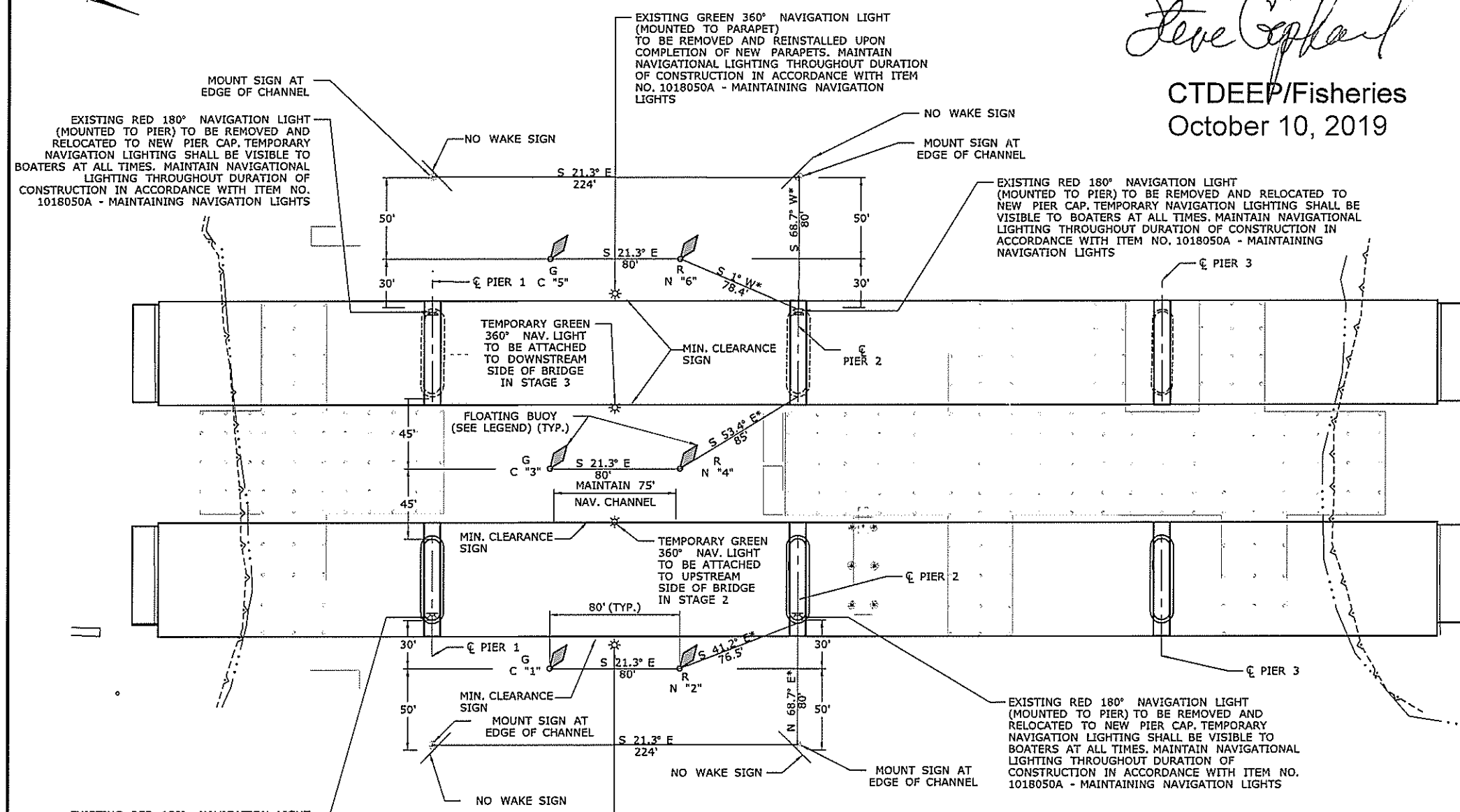
CTDEEP/Fisheries
October 10, 2019

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 8/15/2019

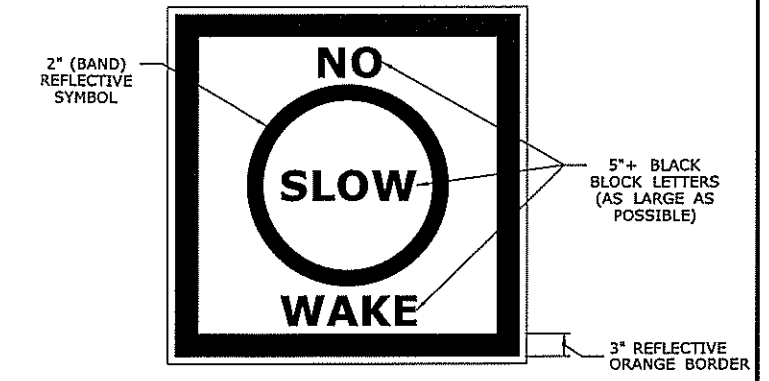
THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.		DESIGNER/DRAFTER: JPM CHECKED BY: DF SCALE AS NOTED	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION Louis Berger US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067	PROJECT TITLE: REHABILITATION OF BRIDGE NO 01218/04180 - I-84 OVER HOUSATONIC RIVER	TOWN: NEWTOWN/SOUTHBURY DRAWING TITLE: TEMPORARY TRESTLE DETAILS 2	PROJECT NO. 96-201 DRAWING NO. PMT-12 SHEET NO. 01.12
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 8/15/2019	Filename: ...LSB_MSTL_0096_0201_PMT-12.dgn	

Steve Cephal

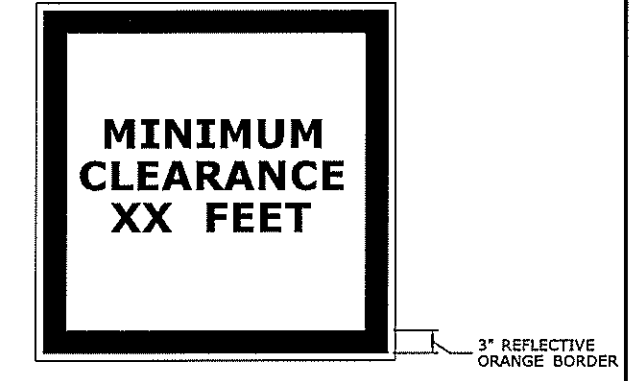
CTDEEP/Fisheries
October 10, 2019



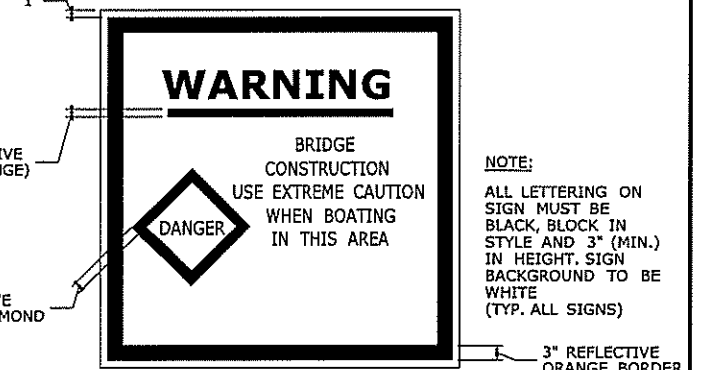
BOAT SAFETY PLAN
SCALE: 1" = 40'



"NO WAKE" SIGN 48" x 48"
SCALE: 1" = 1'



"MIN. CLEARANCE" SIGN 48" x 48"
SCALE: 1" = 1'



"WARNING" SIGN 48" x 48"
SCALE: 1" = 1'

NOTE:
ALL LETTERING ON SIGN MUST BE BLACK, BLOCK IN STYLE AND 3" (MIN.) IN HEIGHT. SIGN BACKGROUND TO BE WHITE (TYP. ALL SIGNS)

NOTES:

1. ALL TEMPORARY WORKS AND EQUIPMENT SHALL MEET THE REQUIREMENTS OF THE US COAST GUARD AND CT DEEP BOATING.
2. ALL WORK AND MATERIALS REQUIRED TO ESTABLISH, MAINTAIN AND REMOVE BUOYS, SIGNS, LIGHTS AND CHANNEL MARKERS AS SHOWN ON THE BOAT SAFETY PLAN OR OTHERWISE REQUIRED BY THE COAST GUARD, DEEP BOATING OR THE ENGINEER SHALL BE INCLUDED AND PAID FOR UNDER ITEM NUMBER 1018013 "TEMPORARY WATERWAY CONSTRUCTION MARKERS". SEE SPECIAL PROVISIONS.
3. NAVIGATION LIGHTS ATTACHED TO BRIDGE SHALL REMAIN ON AT ALL TIMES IN ACCORDANCE WITH ITEM NO. 1018050A - MAINTAINING NAVIGATION LIGHTS.
4. FULL NAVIGATION CHANNEL CLOSURES SHALL NOT OCCUR DURING WEEKENDS FROM MAY 1ST UNTIL OCTOBER 15TH
5. CONTRACTOR BARGES AND WORK BOATS TO BE TIED OFF OR ANCHORED WITH SPUDS IN SPANS 1 & 3 WHEN NOT IN USE.
6. BUOYS MUST MEET THE REQUIREMENTS OF THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION. BUOYS SHALL HAVE A MINIMUM DIAMETER OF 9 INCHES.
7. BEACONS (SIGNS) MUST BE MANUFACTURED OF EIGHTY GAUGE ALUMINUM OR POLYMER OF HARD PLASTIC EQUIVALENT AT LEAST THREE MILLS THICK, OR THREE- QUARTER INCH (3/4") MARINE GRADE PLYWOOD. THEY MUST BE REFLECTIVE WHITE WITH AN INTERNATIONAL ORANGE BAND OF AT LEAST THREE INCHES (3") IN WIDTH FORMING THE OUTER BORDER. ALL SIGNS MUST BE ILLUMINATED

BUOY LEGEND:
G "X" GREEN CAN BUOY NUMBER "X"
R "4" RED NUN BUOY NUMBER "X"

LEGEND:
* 360° GREEN NAVIGATION LIGHT
R 180° RED NAVIGATION LIGHT

* COMPASS BEARING AND DISTANCE BEGINS AT THE FACE OF CENTER LINE OF PIER

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.		DESIGNER/DRAFTER: MEB CHECKED BY: JPM SCALE AS NOTED	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION Louis Berger US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067	PROJECT TITLE: REHABILITATION OF BRIDGE NOS 01218 & 04180 - I-84 EB/WB OVER HOUSATONIC RIVER	TOWN: NEWTOWN/SOUTHBURY DRAWING TITLE: TEMPORARY NAVIGATION LIGHTING/ BOAT SAFETY PLAN	PROJECT NO. 96-201 DRAWING NO. PMT-13 SHEET NO. 01.13
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 8/15/2019		

ENVIRONMENTAL PERMIT PLANS
PLAN DATE: 8/15/2019

TO: Michael Salter, DOT Office of Environmental Planning

FROM: Bruce Williams, DEEP Fisheries Division

DATE: December 10, 2018

SUBJECT: Final Review: I-84 Bridge Rehabilitation, Lake Zoar

Type of Permit:

- 1. **DOT Culvert/Bridge Projects**
- 2. **Diversions**
- 3. **PGP/Inland Wetland**
- 4. **Water Quality Certification**

Project#: 96-201

Bridge#: 01218/04180

Applicant: Connecticut Department of Transportation

State P.E. Project#:

Town: Newtown/Southbury

Waters: Housatonic River/Lake Zoar

Sub Regional Basin #: 6000

Project Scope: Proposed rehabilitation of Bridge# 01218, which carries I-84 eastbound over Housatonic River at Lake Zoar, and Bridge# 04180, which carries the westbound traffic. The scope of the rehabilitation includes the following items:

- Replacement of the existing superstructures with new steel multi-girder superstructures
- Construction of longer pier caps to accommodate the new girder configurations
- Construction of a new concrete collar on the pile cap for pier #3 of Bridge# 04180
- Placement of standard riprap to the edge of the river on the eastern half of the embankment at the south abutment of Bridge# 01218

Fisheries Resources: Lake Zoar supports a large recreational fishery. Important fish species found in the lake include Black Crappie, Largemouth Bass, Smallmouth Bass, Sunfish, White Perch, White Catfish, Walleye, and Yellow Perch.

Comments: The proposed project is expected to have little impact on aquatic resources, but recreational boaters and anglers heavily use the navigational channel under bridges. If the channel under the bridge or the state boat launch is closed to boating, prior notification will need to be given to the DEEP Fisheries Division, DEEP Boating Division, and the Lake Zoar Authority. Prior notification should also be posted at the state boat launch in Southbury. Any closure should be limited in duration and exclude weekends, especially during the summer months.

CC. Steve Gephard

Attachment H: FM General Certification

Project No.: 096-201
Description: Bridge No. 01218, I-84 EB
Bridge No. 04180, I-84 WB
over Housatonic River

Town: Newtown/Southbury
Date: October 3, 2019

memorandum

to: Mr. Michael E. Masayda
Trans. Principal Engineer
Hydraulics and Drainage
Bureau of Engineering and Highway Operations

from: Andrew J. Cardinali Andrew J. Cardinali, P.E. 2019.10.03 10:05:23 -0400
Transportation Supervising Engineer
Bridge CLE Design
Bureau of Engineering and Construction

Please review this request for Flood Management General Certification and indicate your concurrence below.

Certification (to be completed by designer)

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:


- Minor Safety Improvements and Streetscape Projects
- Roadway Repaving, Maintenance & Underground Utilities
- Minor Stormwater Drainage Improvements
- Removal of Sediment or Debris from a Floodplain
- Wetland Restoration Creation or Enhancement
- Scour Repairs at Structures; *(Must acquire DEEP Fisheries Concurrence to be eligible)*
- Guide Rail Installation
- Deck and Superstructure Replacements
- Minor Bridge Repairs and Access
- Fisheries Enhancements
- Surveying and Testing
- Bicycle / Pedestrian, Multi Use Trails and Enhancement Projects

The following required documentation is attached in support of this certification:

- 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 09/27/2019) with FEMA floodplain and floodway boundaries plotted, cross sections and profiles, as necessary, that clearly depict the floodplain involvement
- FEMA 100-year flood elevation plotted on elevation view (for structures)

Print Name: Tracey Brais

Title: Project Manager

Signature: 

Date: 09/30/2019

Concurrence (to be completed by Hydraulics and Drainage)

Based on the documentation submitted, I hereby concur that the project qualifies for Flood Management General Certification.

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: 

Date:

Cheng L. Chow, P.E.
for Michael E. Masayda
2019.10.03 11:06:02 -0400



Connecticut Department of
Energy & Environmental Protection
79 Elm Street
Hartford, CT 06106-5127
www.ct.gov/deep

KIMBERLY C. LESAY,
STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION
2800 BERLIN TPKE
PO BOX 317546
NEWINGTON, CT 06111-4113

10/23/2019

Dear Applicant:

This letter is to confirm the receipt of the following application package:

Permit Type: Construction Activities-GP-3(a)(8-9)

State Project No. 096-201 - The project involves the repair of Bridge No. 01218 and 04180. Each of the existing two-girder floor system superstructures will be replaced with weathering steel multi-girder superstructures. Finger joints will be installed between the abutments and approach slabs. Pier modifications will also occur. A temporary work trestle will be constructed between the bridges and within the Housatonic River for bridge construction. (Newtown and Southbury, CT)

Your application has been assigned the following number: 201912686
Please include this number on all correspondence regarding this application.

As of today, the following materials have been received:

ITEM	REQUIRED FEE	FEE RECEIVED	RECEIVED ON
Application Package			10/22/2019
Application Fee	0.00		

The fee for this application has been discounted 100%.

If there are any questions regarding this notice, please feel free to contact the Central Permit Processing Unit at (860) 424-4004 or DEEP.CentralPermits@ct.gov

If you have specific technical questions regarding your application, please contact the permit program directly: Inland Water Resources Division (860) 424-3019

As a reminder, depending on the type of permit you are seeking, you may be required to publish notice of your application in accordance with section 22a-6g of the General Statutes and submit a copy of such notice to DEEP. If this is the case, DEEP will not process your application further until we have received the certified copy of such notice.

Please remember to check your security settings to be sure you can receive e-mails from (ct.gov) addresses. Also, please notify the department if your e-mail address changes.

Thank you.

Sincerely,

Central Permit Processing Unit



General Permit Registration Form for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, effective 10/1/13 (electronic form)

Prior to completing this form, you **must** read the instructions for the subject general permit at [DEEP-WPED-INST-015](#). This form must be filled out electronically before being printed. You must submit the registration fee along with this form.

The [status of your registration](#) can be checked on the DEEP's ezFile. Portal. Please note that DEEP will no longer mail certificates of registration.

CPPU USE ONLY	
App #:	_____
Doc #:	_____
Check #:	_____
Program:	<u>Stormwater</u>

Part I: Registration Type

Select the appropriate boxes identifying the registration type and registration deadline.

Registration Type		Registration Timeline	
<input type="checkbox"/>	Re-registration Existing Permit No. GSN _____	On or before February 1, 2014* *Note: Failure to renew a permit by this date will require submission of new registration. Re-registrants must only complete Parts I, II, III, IV - Question 1, VII and submit Attachment A.	
<input checked="" type="checkbox"/>	New Registration (Refer to Section 2 of the permit for definitions of Locally Exempt and Locally Approvable Projects)	<input type="checkbox"/> Locally Approvable Size of soil disturbance: _____	New registration - Sixty (60) days prior to the initiation of the construction activity for: For sites with a total soil disturbance area of 5 or more acres
		<input checked="" type="checkbox"/> Locally Exempt Size of soil disturbance: 9.90	<input checked="" type="checkbox"/> New registration - Sixty (60) days prior to the initiation of the construction activity for: Sites with a total disturbance area of one (1) to twenty (20) acres except those with discharges to impaired waters or tidal wetlands
			<input type="checkbox"/> New registration - Ninety (90) days prior to the initiation of the construction activity for: (i) Sites with a total soil disturbance area greater than twenty (20) acres, or (ii) Sites discharging to a tidal wetland (that is not fresh-tidal and is located within 500 feet), or (iii) Sites discharging to the impaired water listed in the "Impaired Waters Table for Construction Stormwater Discharges"

Part II: Fee Information

- 1. New Registrations
 - a. Locally approvable projects (registration only):
 - \$625
 - b. Locally exempt projects (registration and Plan):
 - \$3,000 total soil disturbance area ≥ one (1) and < twenty (20) acres.
 - \$4,000 total soil disturbance ≥ twenty (20) acres and < fifty (50) acres.
 - \$5,000 total soil disturbance ≥ fifty (50) acres.
- 2. Re-Registrations
 - \$625 (sites previously registered prior to September 1, 2012)
 - \$0 (sites previously registered between to September 1, 2012 and effective date of this permit)

Total Fee: \$3,000.00

The fees for municipalities shall be half of those indicated in subsections (a), (b) and (c) above pursuant to Section 22a-6(b) of the Connecticut General Statutes. State and Federal agencies shall pay the full fees specified in this subsection. The registration will not be processed without the fee. The fee shall be non-refundable and shall be paid by certified check or money order payable to the Department of Energy and Environmental Protection.

Part III: Registrant Information

- If a registrant is a corporation, limited liability company, limited partnership, limited liability partnership, or a statutory trust, it must be registered with the Secretary of the State. If applicable, the registrant's name shall be stated **exactly** as it is registered with the Secretary of the State. This information can be accessed at [CONCORD](#)
- If a registrant 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.).

1. Registrant /Client Name: STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION
 Registrant Type: State Agency
 Secretary of the State business ID #: _____
 Mailing Address: 1107 CROMWELL AVE
 City/Town: ROCKY HILL State: CT Zip Code: 06067
 Business Phone: (203) 258-4601 ext.: _____
Example:(xxx) xxx-xxxx
 Contact Person: Donald Ward Title : District Engineer
 E-Mail: donald.ward@ct.gov

2. List billing contact:
 Name: STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION
 Mailing Address: 1107 CROMWELL AVE
 City/Town: ROCKY HILL State: CT Zip Code: 06067
 Business Phone: (203) 258-4601 ext.: _____
 Contact Person: Donald Ward Title : District Engineer

3. List primary contact for departmental correspondence and inquiries:

Name: STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION
Mailing Address: 1107 CROMWELL AVE
City/Town: ROCKY HILL State: CT Zip Code: 06067
Business Phone: (203) 258-4601 ext. _____
Contact Person: Donald Ward Title: District Engineer

4. List owner of the property on which the activity will take place:

Name: STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION
Mailing Address: 1107 CROMWELL AVE
City/Town: ROCKY HILL State: CT Zip Code: 06067
Business Phone: (203) 258-4601 ext. _____
Contact Person: Donald Ward

5. List preparer:

Name: Charles Eaton
Mailing Address: 33 Wilbur Cross Way
City/Town: Storrs Mansfield State: CT Zip Code: 06268
Business Phone: (860)885-1055 ext. 2120
Contact Person: . Title: _____

6. List design professional:

Name: Charles Eaton
Mailing Address: 33 Wilbur Cross Way
City/Town: Storrs Mansfield State: CT Zip Code: 06268
Business Phone: (860)885-1055 ext. 2120
Contact Person: . Title: _____

7. List Reviewing Qualified Professional (for locally approvable projects only):

Name: _____
Mailing Address: _____
City/Town: _____ State: _____ Zip Code: _____
Business Phone: _____ ext. _____
Contact Person: _____ Title: _____

Part IV: Site Information

1. Site Name: ProjNo 0096-0201: I-84 over Housatonic River
Street Address or Description of Location: _____
City/Town: Newtown & Southbury State: CT Zip Code: 06488
Brief Description of construction activity:
Bridge repairs and construction of temporary roadways.
Project Start Date: 1 Apr 2020 Anticipated Completion Date: 30 Oct 2023
Normal working hours: 7 AM to 4 PM

2. **MINING** : Is the activity on the site in question part of mining operations (i.e. sand and gravel)? Yes No

If yes, mining is not authorized by this general permit. You must submit the Registration Form for the General Permit for the Discharge of Stormwater Associated with Industrial Activity.

3. **COMBINED OR SANITARY SEWER**: Does all of the stormwater from the proposed activity discharge to a combined or sanitary sewer (i.e. a sewage treatment plant)? Yes No

If yes, this activity is not regulated by this permit. Contact the Water Permitting & Enforcement Division at 860-424-3018.

4. **INDIAN LANDS**: Is or will the facility be located on federally recognized Indian lands? Yes No

5. **COASTAL BOUNDARY**: Is the activity which is the subject of this registration located within the coastal boundary as delineated on DEEP approved coastal boundary maps? Yes No

The coastal boundaries fall within the following towns: Branford, Bridgeport, Chester, Clinton, Darien, Deep River, East Haven, East Lyme, Essex, Fairfield, Greenwich, Groton (City and Town), Old Lyme, Guilford, Hamden, Ledyard, Lyme, Madison, Milford, Montville, New London, New Haven, North Haven, Norwalk, Norwich, Old Saybrook, Orange, Preston, Shelton, Stamford, Stonington (Borough and Town), Stratford, Waterford, West Haven, Westbrook and Westport.

If "yes", and this registration is for a new authorization or a modification of an existing authorization where the physical footprint of the subject activity is modified, you must provide documentation to the DEEP Office of Long Island Sound Programs or the local governing authority has issued a coastal site plan approval or determined the project is exempt from coastal site plan review. Provide this documentation with your registration as Attachment B. See guidance in Appendix D of the general permit. Information on the coastal boundary is available at the local town hall or on the [Connecticut Coastal Resources Map](#) . Additional DEEP Maps and Publications are available by contacting DEEP Staff at 860-424-3555.

6. **ENDANGERED OR THREATENED SPECIES**:

In order to be eligible to register for this General permit, each registrant must either perform a self-assessment, obtain a limited one-year determination, or obtain a safe-harbor determination regarding threatened and endangered species. This may include the need to develop and implement a mitigation plan. While each alternative has different limitations, the alternatives are not mutually exclusive; a registrant may register for this General Permit using more than one alternative, See Appendix A of the general Permit. Each registrant must complete this AND Attachment C to this Registration form and a registrant who does not or cannot do so is not eligible to register under this General Permit.

Each registration must perform a review of the Department's Natural Diversity Database maps to determine if the site of the construction activity is located within or in proximity (within ¼ mile) to a shaded area.

- a. Provide the date of the NDDDB maps were reviewed: 19 Nov 2019 (Print a copy of the NDDDB map you viewed since it must be submitted with this registration as part of Attachment C.)

b. For a registrant using a limited one-year determination or safe harbor determination to register for this General Permit, provide the Department's Wildlife Division NDDB identification number for any such determination:

201913154 (The number is on the determination issued by the Department's Wildlife Division).

For more information on threatened and endangered species requirements, refer to Appendix A and section 3(b)(2) of this General Permit, Visit the DEEP website at [Natural Diversity Data Base](#) or call the NDDB at 860-424-3011.

c. I verify that I have completed Attachment C to this Registration Form. Yes

7. **WILD AND SCENIC RIVERS:** Is the proposed project within the watershed of a designated Wild and Scenic River? (See Appendix H for guidance) Yes No

8. **AQUIFER PROTECTION AREAS:** Is the site located within a mapped [Aquifer Protection Area](#) , as defined in Section 22a-354h of the CT General Statutes? (For additional guidance, please refer to Appendix C of the General Permit) Yes No

9. **Connecticut Guidelines for Soil Erosion and Sediment Control Guidelines:** Is the activity in accordance with Connecticut Guidelines for Soil Erosion and Sediment Control Guidelines and local erosion & sediment control ordinances, where applicable? Yes No

10. HISTORIC AND/OR ARCHAEOLOGICAL RESOURCES:

Has the site of the proposed activity been reviewed (using the process outlined in Appendix G of this permit) for historic and/or archaeological resources? Yes No

a. The review indicates the proposed site does not have the potential for historic/ archaeological resources, OR Yes No

b. The review indicated historic and/ or archaeological resource potential exists and the proposed activity is being or has been reviewed by the Offices of Culture and Tourism, OR NA Yes No

c. The proposed activity has been reviewed and authorized under an Army Corps of Engineers Section 404 wetland permit. NA Yes No

11. CONSERVATION OR PRESERVATION RESTRICTION:

Is the property subject to a conservation or preservation restriction? Yes No

If Yes, proof of written notice of this registration to the holder of such restriction or a letter from the holder of such restriction verifying this registration is in compliance with the terms of the restriction, must be submitted as Attachment D.

Part V: Stormwater Discharge Information

Table 1

Outfall #	a) Type	b) Pipe Material	c) Pipe Size	d) Note: To find lat/long, go to: CT ECHO . A decimal format is required here. Directions on how to use CT ECHO to find lat. /long. and conversions can be found in in Part V, section d of the DEEP-WPED-INST-015 .		e) What method was used to obtain your latitude/longitude information?
				Longitude (Format: -xx.xxxxx)	Latitude (Format: xx.xxxxx)	
PO-3	Pipe	Concrete	15"	-73.247231	41.438154	ezFile Portal Map
EX-8	Other (Please fill in below) Scupper			-73.248128	41.439104	ezFile Portal Map
EX-9	Other (Please fill in below) Scupper			-73.247468	41.439084	ezFile Portal Map
PO-7	Pipe	Concrete	24"	-73.248004	41.440749	ezFile Portal Map
TO-1	Pipe	Concrete	15"	-73.247155	41.438176	ezFile Portal Map

Part V: Stormwater Discharge Information Continued

Table 2

2. Provide the following information about the receiving water(s)/wetland(s) that receive stormwater runoff from your site, either directly or through the storm sewer system:									
Outfall #	Dates when this outfall will be active:	a) To what system or receiving water does your stormwater runoff discharge? either "storm sewer or wetlands" or "waterbody" (If you select storm sewer or wetlands, columns c.1&2 of this table are not required to be completed)	b) What is your watershed ID (freshwater) or 305b ID (estuary)? (Section 3.b, DEP-GP-INST-015 of the explains how to find this information)	c.1) Is your receiving water identified as an impaired water in the "Impaired Waters Table for Construction Stormwater Discharges"?		c.2) Has any Total Maximum Daily Load (TMDL) been approved for your receiving waterbody?		For the drainage area associated with each outfall: Effective Impervious Area Before Construction (sq ft)	For the drainage area associated with each outfall: Effective Impervious Area After Construction (sq ft)
				Yes	No	Yes	No		
PO-3	Start: 1 Oct 2021 End:	Waterbody		<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA	181803.18	181803.18	
EX-8	Start: 1 Oct 2021 End:	Waterbody		<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA	48000	48000	
EX-9	Start: 1 Oct 2021 End:	Waterbody		<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA	53200	53200	
PO-7	Start: 1 Oct 2021 End:	Waterbody		<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA	136451.85	116559.88	
TO-1	Start: 1 Jun 2020 End: 1 Nov 2023	Waterbody		<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA	13333	13333	
Provide the total effective impervious area for the entire site(sq ft):								534812.23	514920.26

Part V: Stormwater Discharge Information

Table 1

Outfall #	a) Type	b) Pipe Material	c) Pipe Size	d) Note: To find lat/long, go to: CT ECHO . A decimal format is required here. Directions on how to use CT ECHO to find lat. /long. and conversions can be found in in Part V, section d of the DEEP-WPED-INST-015 .		e) What method was used to obtain your latitude/longitude information?
				Longitude (Format: -xx.xxxxx)	Latitude (Format: xx.xxxxx)	
EX-1	Pipe	Metal	her (Please fill in below 30	-73.252457	41.429114	ezFile Portal Map
EX-2	Pipe	Metal	24"	-73.250456	41.430932	ezFile Portal Map
EX-3	Pipe	Metal	15"	-73.248240	41.432561	ezFile Portal Map

Part V: Stormwater Discharge Information Continued

Table 2

2. Provide the following information about the receiving water(s)/wetland(s) that receive stormwater runoff from your site, either directly or through the storm sewer system:								
Outfall #	Dates when this outfall will be active:	a) To what system or receiving water does your stormwater runoff discharge? either "storm sewer or wetlands" or "waterbody" (If you select storm sewer or wetlands, columns c.1&2 of this table are not required to be completed)	b) What is your watershed ID (freshwater) or 305b ID (estuary)? (Section 3.b, DEP-GP-INST-015 explains how to find this information)	c.1) Is your receiving water identified as an impaired water in the "Impaired Waters Table for Construction Stormwater Discharges"?	c.2) Has any Total Maximum Daily Load (TMDL) been approved for your receiving waterbody?		For the drainage area associated with each outfall: Effective Impervious Area Before Construction (sq ft)	For the drainage area associated with each outfall: Effective Impervious Area After Construction (sq ft)
					If you answered yes to question c.1, then answer the question below	Y		
EX-1	Start: 21 Oct 2021 End: 20 Oct 2023	Waterbody		<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA		31695	31695
EX-2	Start: 21 Oct 2021 End:	Waterbody	412	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA		40725.2	40725.2
EX-3	Start: 21 Oct 2021 End: 20 Oct 2023	Storm Sewer or Wetlands		<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA		31604	31604
	Start: _____ End: _____	Select One		<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA			
Provide the total effective impervious area for the entire site(sq ft):								
							534812.23	514920.26

Part V: Stormwater Discharge Information (continued)

Impaired waters: If you answered "yes" to Table 2, question 2.c.1, **verify** that the project's Pollution Control Plan (Plan) addresses the control measures below in Question 1 or 2, as appropriate.

1. **If the impaired water does not have a TMDL**, confirm compliance by selecting 1.a. or 2.b. below:

a. No more than 3 acres is disturbed at any time; Yes

OR

b. Stormwater runoff from a 2 yr, 24 rain event is **retained**. Yes

2. **If the impaired water has a TMDL**, confirm compliance by selecting 2.a. and 2.b. below and either question 2.c.1. or 2.c.2. below:

a. The Plan documents there is sufficient remaining Waste Load Allocations (WLA) in the TMDL for the proposed discharge, Yes

AND

b. Control measures shall be implemented to assure the WLA will not be exceeded, Yes

AND

c. 1. Stormwater discharges will be monitored for the indicator pollutant identified in the TMDL, Yes

OR

2. The Plan documents specific requirements for stormwater discharges specified in the TMDL. Yes

Part VI: Pollution Control Plan Availability (check one of the following four categories)

I am registering a Locally Exempt project and submitting the required electronic Plan (in Adobe™ PDF or similarly publically available format) pursuant to Section 3(c)(2)(E) of this permit.

Plan is attached to this registration form

Plan is available at the following Internet Address (URL):

I am registering a Locally Approvable project and have chosen not to submit the Plan with this registration pursuant to Section 3(c)(1) of this permit.

I am registering a Locally Approvable project and have chosen to make my Plan electronically available pursuant to Section 4(c)(2)(N) of this permit.

Plan is attached to this registration form

Plan is available at the following Internet Address (URL):

I am registering a Locally exempt project and do not have the capability to submit the Plan electronically. Therefore, I am submitting a paper copy with this registration as Attachment E.

Part VII: Registrant Certification

The registrant *and* the individual(s) responsible for actually preparing the registration must sign this part. A registration will be considered incomplete unless all required signatures are provided.

For New Registrants:

"I hereby certify that I am making this certification in connection with a registration under such general permit, submitted to the commissioner by E OF CONNECTICUT DEPARTMENT OF TRANSPORTA for an activity located at _____, Newtown & Southbury, CT 06488 and that all terms and conditions of the general permit are being met for all discharges which have been initiated and such activity is eligible for authorization under such permit. I further certify that a system is in place to ensure that all terms and conditions of this general permit will continue to be met for all discharges authorized by this general permit at the site. I certify that the registration filed pursuant to this general permit is on complete and accurate forms as prescribed by the commissioner without alteration of their text. I certify that I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in Section 3(b)(8)(A) of such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I certify that I have made an affirmative determination in accordance with Section 3(b) (8) (B) of this general permit. I understand that the registration filed in connection with such general permit is submitted in accordance with and shall comply with the requirements of Section 22a-430b of Connecticut General Statutes, as amended by Public Act 12-172. I also understand that knowingly making any false statement made in the submitted information and in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under Section 53a-157b of the Connecticut General Statutes and any other applicable law."

For Re-registrants:

"I hereby certify that I am making this certification in connection with a registration under the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, submitted to the commissioner by _____ for an activity located at _____ and that all terms and conditions of the general permit are being met for all discharges which have been initiated and such activity is eligible for authorization under such permit. I further certify that all designs and plans for such activity meet the current terms and conditions of the general permit in accordance with Section 5(b)(5)(C) of such general permit and that a system is in place to ensure that all terms and conditions of this general permit will continue to be met for all discharges authorized by this general permit at the site. I verify that the registration filed pursuant to this general permit is on complete and accurate forms as prescribed by the commissioner without alteration of their text. I certify that I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in Section 3(b)(8)(A) of such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this verification is based is true, accurate and complete to the best of my knowledge and belief. I also understand that knowingly making any false statement made in the submitted information and in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under Section 53a-157b of the Connecticut General Statutes and an other applicable law."

_____	_____
Signature of Registrant	
Donald Ward	District Engineer
Name of Registrant (print or type)	Title (if applicable)
_____	_____
Signature of Preparer and Date (if different than above)	
.	
_____	_____
Name of Preparer (print or type)	Title (if applicable)

Part VIII: Professional Engineer (or Landscape Architect, where appropriate) Design Certification (for publically approvable and exempt projects)

The following certification must be signed by a Professional Engineer, or Landscape Architect where appropriate.

<p>"I hereby certify that I am a _____ licensed in the State of Connecticut. I am making this certification in connection with a registration under such general permit, submitted to the commissioner by <u>STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION</u> for an activity located at _____, Newtown & Southbury, CT 06488 _____.</p> <p>I certify that I have thoroughly and completely reviewed the Stormwater Pollution Control Plan for the project or activity covered by this certification. I further certify, based on such review and on the standard of care for such projects, that the Stormwater Pollution Control Plan has been prepared in accordance with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, the Stormwater Quality Manual, as amended, and the conditions of the general permit, and that the controls required for such Plan are appropriate for the site. I further certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I also understand that knowingly making any false statement in this certification may subject me to sanction by the Department and/or be punishable as a criminal offense, including the possibility of fine and imprisonment, under Section 53a-157b of the Connecticut General Statutes and any other applicable law."</p>	
<p>_____</p>	
<p>Signature of Design Professional and Date</p>	
<p>_____</p>	<p>22337</p>
<p>Name of Professional (print or type)</p>	<p>License Number</p>
<p>Affix P.E./L.A Stamp Here</p>	

Part IX: Reviewing Qualified Professional Certification

The following certification must be signed by a) a Conservation District reviewer OR, b) a qualified soil erosion and sediment control and/ or professional engineer

<input type="checkbox"/> Review Certification by Conservation District:
1.) District: _____ Date of Affirmative Determination: _____
“ I am making this certification in connection with a registration under General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities, submitted to the commissioner by _____ for an activity located at _____. I have personally examined and am familiar with the information that provides the basis for this certification, and I affirm, based on the review described in Section 3(b)(11)(C) of this general permit and on the standard of care for such projects, that the Stormwater Pollution Control Plan is adequate to assure that the activity authorized under this general permit will comply with the terms and conditions of such general permit and that all stormwater management systems: (i) have been designed to control pollution to the maximum extent achievable using measures that are technologically available and economically practicable and that conform to those in the Guidelines and the Stormwater Quality Manual; (ii) will function properly as designed; (iii) are adequate to ensure compliance with the terms and conditions of this general permit; and (iv) will protect the waters of the state from pollution.”
_____ Signature of District Professional and Date
_____ Name of District Professional
_____ License Number (if applicable)
Or
<input type="checkbox"/> Review Certification by Qualified Professional:
Company Name: _____
Name: _____
License #: _____
Level of independency of professional:
Required for all projects disturbing over 1 acre:
1. I verify I am not an employee of the registrant. <input type="checkbox"/> Yes
2. I verify I have no ownership interest of any kind in the project for which the registration is being submitted. <input type="checkbox"/> Yes
Required for projects with 15 or more acres of site disturbance (in addition to questions 1&2):
3. I verify I did not engage in any activities associated with the preparation, planning, designing or engineering of the soil erosion and sediment control plan or stormwater management systems plan for this registrant. <input type="checkbox"/> Yes
4. I verify I am not under the same employ as any person associated with the preparation, planning, designing or engineering of the soil erosion and sediment control plan or stormwater management systems plan for this registrant. <input type="checkbox"/> Yes

Part IX: Reviewing Qualified Professional Certification (continued)

"I hereby certify that I am a qualified professional engineer or qualified soil erosion and sediment control professional, or both, as defined in the General Permit for Discharge of Stormwater and Dewatering Wastewaters from Construction Activities and as further specified in Sections 3(b)(11)(A) and (B) of such general permit. I am making this certification in connection with a registration under such general permit, submitted to the commissioner by _____ for an activity located at _____.

I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in Section 3(b)(11)(C) of such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I certify, based on my review of all information described in Section 3(b)(11)(C) of such general permit and on the standard of care for such projects, that I have made an affirmative determination in accordance with Sections 3(b)(11)(D)(i) and (ii) of this general permit. I understand that this certification is part of a registration submitted in accordance with Section 22a-430b of Connecticut General Statutes, as amended by Public Act 12-172, and is subject to the requirements and responsibilities for a qualified professional in such statute. I also understand that knowingly making any false statement in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under Section 53a-157b of the Connecticut General Statutes and any other applicable law."

Signature of Reviewing Qualified Professional

Name of Reviewing Qualified Professional

License No.

Affix P.E./ L.A. Stamp Here

Note: Please submit the fee along with a completed, printed and signed Registration Form and all additional supporting documents to:

**CENTRAL PERMIT PROCESSING UNIT
DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127**

STORMWATER POLLUTION CONTROL PLAN

**Rehabilitation of Bridge No.s 01218 & 04180
Newtown/Southbury, CT**

**State Project No.: 0096-0201
EzFile No. 53899**

Connecticut Department of Transportation



November 19, 2019

This Stormwater Pollution Control Plan (SPCP) is prepared to comply with the requirements for the General Permit for Stormwater Discharges (GPSD) from Construction Activities. Also to be considered part of the SPCP are the proposed construction plans, special provisions, and the Connecticut Department of Transportation's "Standard Specifications for Roads, Bridges and Incidental Construction" (Form 817) including supplements thereto and the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control

Stormwater Pollution Control Plan
Connecticut Department of Transportation

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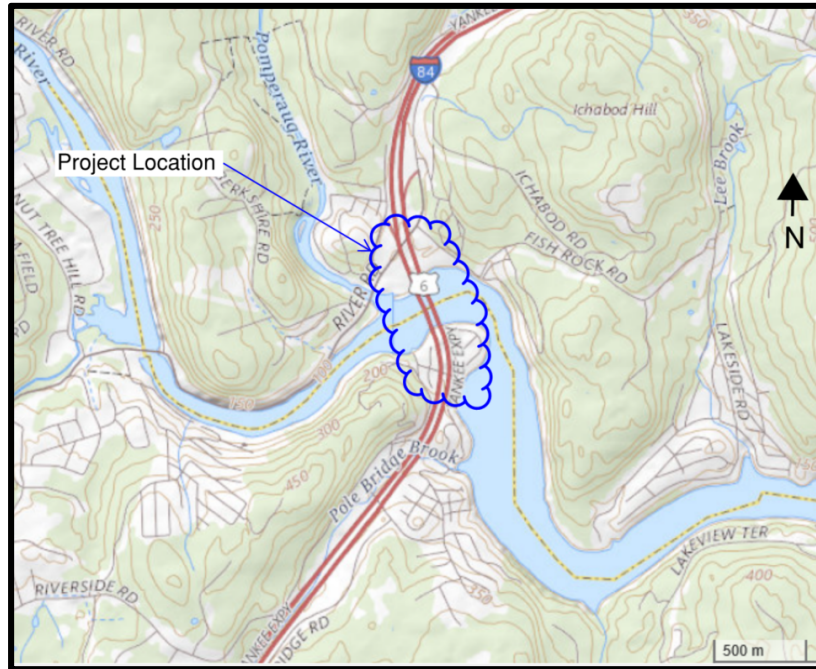
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1. Site Description



This project consists of the rehabilitation and full replacement of the superstructure of Bridge Nos. 01218 and 04180 carrying I-84 over the Housatonic River. Bridge No. 01218 was deemed structurally deficient based on review from ConnDOT's Bridge Inspection Reports. Bridge No. 04180 was not considered to be structurally deficient but was found to have numerous issues that require strengthening repairs in order to provide for a new deck. Aside from the structural components, this project work also includes utility relocation, drainage modifications, and temporary roadway crossover construction. There is no increase in impervious area proposed within this project. The project is located between Newtown and Southbury, in a residential area. The Housatonic River is classified as an impaired waterway due to Chlorophyll-a, excess algal growth, and nutrient/eutrophication biological indicators.

Interstate 84, in the vicinity of the project, is a two-lane highway with a grassed barrier median dividing the eastbound and westbound lanes. The roadway is crowned and the roadway slopes in a south to north direction. The existing drainage on the bridges consist of scuppers that free fall into the Housatonic River below. The existing drainage on the highway is collected by catch basins in both the median and shoulders and discharged to the Housatonic River. The proposed drainage system will divert approximately 1 acre of the highway drainage to a new water quality swale and approximately 6 acres to a new water quality basin thereby providing water quality improvement prior to discharge to the Housatonic River.

The project is not located within an Aquifer Protection Area or within the National Wild and Scenic River System, but it is located within two public water supplies. The project is within an identified location of State and Federal Listed Species and Significant Natural Communities for bald eagles and eastern box turtles. Protection strategies for both species have been established for the project and approved by DEEP.

Estimated Disturbed Area

The total area for this project site is 22.7 acres. Of this area, 10 acres will be disturbed by construction activities.

Estimated Runoff Coefficient

The runoff coefficient assumed for pavement is 0.9. For the pervious areas, a coefficient of 0.3 was assumed. There is a decrease in impervious area associated with the proposed project.

Pre-Construction

$$\frac{(11 \text{ ac.} \times 0.9) + (11.7 \text{ ac.} \times 0.3)}{11 \text{ ac.} + 11.7 \text{ ac.}} = 0.59$$

11 ac. + 11.7 ac.

Post-Construction

$$\frac{(10.6 \text{ ac.} \times 0.9) + (12.1 \text{ ac.} \times 0.3)}{10.6 \text{ ac.} + 12.1 \text{ ac.}} = 0.58$$

10.6 ac. + 12.1 ac

Receiving Waters

The name of the receiving water is the Housatonic River.

Extent of Wetlands on Site

There are anticipated impacts to wetlands and waterways that are to be affected by this project. Approximately 729 square feet of wetland is to be impacted by the proposed temporary trestle. Another approximately 2,350 square feet of waterway is expected to be impacted by the cofferdam around Bridge No. 04180 Pier 3. Other than these listed, no other wetland or waterways are proposed to be impacted temporarily or permanently.

2. Construction Sequencing

The Contractor will be given approximately three years for the construction of all phases of the project.

The suggested sequence of construction is as follows:

1. Conduct a preconstruction meeting.
2. Install sediment control system.
3. Construct temporary access roads.
4. Place signs and channel markers for temporary channel through waterway.
5. Construct crossover roadway sections in median.
6. Install crossover pattern for I-84 westbound
7. Remove Bridge No.04180 and construct new bridge
8. Install crossover pattern for I-84 eastbound.
9. Remove Bridge No. 01218 and construct new bridge.
10. Remove all temporary items and restore median.
11. Remove erosion controls when it is determined that disturbed areas have been stabilized. (This determination will be made by the Qualified Inspector).
12. All post-construction stormwater structures shall be cleaned of construction sediment and any remaining silt fence shall be removed.
13. File "Notice of Termination Form".
14. Perform project cleanup.

If the construction sequencing activities create an area of disturbance with a total contributing drainage area of between two (2) acres and five (5) acres per discharge point, a temporary sediment trap must be provided, and the Contractor must submit to the Engineer a revised SWPCP for review and approval. The SWPCP must include locations of the temporary sedimentation trap per discharge point with a capacity to contain 134 cubic yards per acre of material in accordance with the 2002 CT Erosion and Sedimentation Guidelines (2002 Guidelines). The Contractor shall provide an inspection and maintenance plan for the temporary sedimentation trap as part of the amended SWPCP.

If the areas of disturbance with a total contributing drainage area of more than five (5) acres per discharge point, a temporary engineered sedimentation basin must be provided, and the Contractor must submit to the Engineer a revised SWPCP for review and approval. The SWPCP must include locations of the temporary engineered sedimentation basin designed and installed in accordance with the 2002 Guidelines. The Contractor shall provide an inspection and maintenance plan or the engineered sedimentation basin as part for the amended SWPCP.

3. Control Measures

Sedimentation and erosion control site plans are included in Appendix C at the end of the Drainage Report. Locations of inlet protection, sedimentation control systems, and erosion control are shown on the plans.

Erosion and Sedimentation Controls

A qualified inspector will be assigned to the project in order to oversee the Contractor's operations to ensure compliance with the provisions of the Contract.

The following timelines will be followed for the proposed construction activities:

- If construction activities are completed to final grade, permanent seeding shall take place within seven (7) days.
- Areas that remain disturbed but inactive for at least 30 days shall receive temporary seeding or soil protection within seven (7) days.
- Areas that will be disturbed past the planting season will be covered with a long-term, non-vegetative stabilization method that will provide protection through the winter.
- The Contractor shall stabilize disturbed areas with temporary or permanent measures as quickly as possible after the land is disturbed. Requirements for soil stabilization are detailed in Form 817 Section 1.10, Environmental Compliance.

Soil Stabilization and Protection

The existing condition of the proposed disturbed areas are well vegetated and moderately sloped. The Contractor shall use temporary and permanent soil stabilization methods as described below:

Temporary Stabilization Practices

- Sedimentation Control System (SCS): SCS shall be placed at the toe of the slope or as directed by the Engineer
- Anti-Tracking Pads: Construction entrances (gravel anti-tracking pads) shall be constructed at truck access/exit points to off-road route. Access road(s) should grade away from the main roadway or waterbody.
- Dust Control: Routine sweeping and application of dust suppression agents, including but not limited to, water and calcium chloride, over exposed subbase shall be completed for dust control. Additional measures may be necessary to minimize dust within the project limits and within staging and stockpile areas.
- Temporary Seeding: On soils to be exposed for a period greater than 1 month but less than 1-

year, temporary seeding shall be used to temporarily stabilize the soil until permanent stabilization is established.

- Sediment Control System at Catch Basin: Catch basin inlet protection shall be used to reduce the amount of sediment entering the storm drainage system during construction.

Stabilization practices shall be implemented after completion, as final grades are reached, within seven (7) days.

The slopes of the soil stockpile shall be stabilized every 4-feet of height gained during the hauling and stockpiling of material.

Temporary seeding shall be spread over any disturbed areas which will remain inactive for at least 30 days. Areas to remain disturbed through winter shall be protected with non-vegetative stabilization measures. The Contractor must provide an Erosion and Sedimentation Control plan for each winter season during construction operations.

The Contractor may use other controls in the project as necessary if they conform to the 2002 Guidelines and are approved by the Engineer. The Contractor will be required to provide the necessary details for any erosion controls not specifically called for on the project plans.

During construction, all areas disturbed by the construction activity that have not been stabilized, structural control measures, and locations where vehicles enter or exit the site shall be inspected at least once a week and within 24 hours of the end of a storm that generates a discharge. For storms that end on a weekend, holiday or other time in which normal working hours will not commence within 24 hours, an inspection is required within 24 hours following any storm in which 0.5 inches or greater of rain occurs. For lesser storms, inspection shall occur immediately upon the start of subsequent normal working hours.

Permanent Stabilization Practices

During construction, the following methods of permanent stabilization shall be installed:

- Topsoiling: In conjunction with permanent seeding, once final grades have been established, topsoil shall be applied to provide a suitable growth medium for vegetation.
- Permanent Seeding: Once soils have been brought to final grade, permanent seeding shall be used to stabilize the soil with a vegetative cover. Disturbed areas below the wetland limit shall be seeded with a wetland seed mix and/or above the wetland limit shall be seeded with a conservation seed mix.

All new embankments disturbed by construction and unpaved areas that are graded or disturbed by construction will receive erosion control matting, topsoil and/or turf establishment. The Contractor may use other permanent stabilization practices approved by the Engineer and conforming to 2002 Guidelines.

Structural Measures

The following structural measures shall be used to divert flows, limit runoff, and minimize the discharge of pollutants:

- Outlet Protection: Riprap outlet protection shall be used at the proposed outlet to decrease velocity and the potential for erosion.
- Deep Sump Catch Basins: Deep sump catch basins (4-foot sump) shall be used, especially adjacent to outlets, to intercept pollutants and debris.
- Water Quality Swale & Water Quality Basin: A water quality swale shall be used to provide water quality treatment. The swale includes stone check dams.

Maintenance

All construction activities and related activities shall conform to the requirements of Section 1.10 "Environmental Compliance" of the Department's Standard Specifications, Form 817. In general, all construction activities shall proceed in such a manner so as not to pollute any wetlands, watercourses, water body, and conduit carrying stormwater. The Contractor shall limit, in so far as possible, the surface area of earthen materials exposed by construction activity and immediately provide temporary and permanent pollution control to prevent soil erosion and contamination on the site. Water pollution control provisions and best management practices per Section 1.10, Environmental Compliance of the Standard Specifications shall be administered during construction. Control measures shall be inspected and maintained in accordance with the 2002 Guidelines and as directed by the Engineer.

4. Dewatering Wastewaters

When dewatering is necessary, pumps used shall not be allowed to discharge directly into a wetland, watercourse or stormwater drainage system. Prior to any dewatering, the Contractor must submit to the Engineer a written proposal for specific methods and devices to be used, and must obtain the Engineer's written approval of such methods and devices, including, but not limited to, the pumping of water into a temporary sedimentation basin, providing surge protection at the inlet or outlet of pumps, floating the intake of a pump, or any other method for minimizing and retaining the suspended solids. If the Engineer determines that a pumping operation is causing turbidity problems, the Contractor shall halt said operation until a means of controlling the turbidity is submitted by the Contractor in writing to the Engineer, approved in writing by the Engineer and implemented by the Contractor. No discharge of dewatering wastewater shall contain or cause a visible oil sheen, floating solids or foaming in the receiving water. If required, all activities are to be performed in compliance with the Department's Form 817. During utility company work, a tank for any dewatering discharge will be located on site.

5. Post-Construction Stormwater Management

Post-construction Guidelines

After the project is complete, the DOT will perform the following maintenance and restorative measures:

- Litter/debris and sweepings will be removed from the site regularly.
- Mowing and maintenance of the turf areas and vegetated areas will occur as needed.
- Riprap outlet protection will be inspected and repaired annually or as needed.
- Stormwater drainage system will be cleaned of sediment/debris.

Post Construction Performance Standards

Redevelopment:

The project has 47% impervious cover.

$(9.0 \text{ acres impervious} / 19.1 \text{ acres total project area}) \times 100\% = 47\%$

Runoff Reduction and LID Practices:

The project results in a decrease in impervious surface area as compared to existing conditions therefore runoff will decrease. In addition, the installation of deep sump catch basins, stabilized outlets and a water quality swale and basin will improve the quality of the stormwater discharged to the Housatonic River over existing conditions. In existing conditions, roadway runoff is discharged directly to the river without any pre-treatment. The site plans in Appendix C at the end of the Drainage Report demonstrate the proposed drainage patterns and reduced impervious area.

Suspended Solids and Floatables Removal:

All catch basins installed as part of this project will have a minimum of 4-foot deep sumps to remove initial suspended solids.

Velocity Dissipation:

Riprap Apron: Riprap apron shall be used to slow down outlet velocities and stabilize outlets.

Check Dams: Stone check dams will decrease velocities in the proposed water quality swale.

6. Other Controls

Waste Disposal

Construction site waste shall be properly managed and disposed of during the entire construction period. Additionally,

- A waste collection area will be designated. The selected area will minimize truck travel through the site and will not drain directly to the adjacent wetlands.
- Waste collection shall be scheduled regularly to prevent the containers from overflowing.
- Spills shall be cleaned up immediately.
- Defective containers that may cause leaks or spills will be identified through regular inspection. Any found to be defective will be repaired or replaced immediately.
- Any stockpiling of materials should be confined to the designated area as approved by the engineer.

Washout Areas

Washout of applicators, containers, vehicles and equipment for concrete shall be conducted in a designated washout area. No surface discharge of washout wastewaters from the area will be allowed. All concrete wash water will be directed into a container or pit such that no overflows can occur. Washout shall be conducted in an entirely self-contained system and will be clearly designed and flagged or signed where necessary. The washout area shall be located outside of any buffers and at least 50 feet from any stream, wetland or other sensitive water or natural resources as determined or designated by the Department's Office of Environmental Planning or the project engineer.

Washout Area(s) will be site located by the Contractor, approved by the engineer and the SWPCP revised as appropriate. The "Concrete Washout Area" detail shows the recommended method of construction for the washout area. The designated area shall be designed and maintained such that no overflows can occur during rainfall or after snowmelt.

Anti-tracking Pads and Dust Control (Form 817- Sections 2.11/9.39/9.42/9.43)

Off-site vehicle tracking of sediments and the generation of dust shall be minimized. Temporary anti-tracking pads from the active work site to the existing pavement will be installed and maintained at the locations shown on the plans. The Contractor shall:

- Maintain the entrance in a condition which will prevent tracking and washing of sediment onto paved surfaces.
- Provide periodic top dressing with additional stone or additional length as conditions demand.
- Repair any measures used to trap sediment as needed.
- Immediately remove all sediment spilled, dropped, washed or tracked onto paved surfaces.
- Ensure roads adjacent to a construction site are left clean at the end of each day.

If the construction entrance is being properly maintained and the action of a vehicle traveling over the stone pad is not sufficient to remove the majority of the sediment, then the contractor shall either:

- Increase the length of the construction entrance,
- Modify the construction access road surface, or
- Install washing racks and associated settling area or similar devices before the vehicle enters a paved surface.

For construction activities which cause airborne particulates, wet dust suppression shall be utilized. Construction site dust will be controlled by sprinkling the ground surface with water until it is moist on an as-needed basis. The volume of water sprayed shall be such that it suppresses dust yet also prevents the runoff of water.

Post-Construction

Upon completion of construction activities and stabilization of the site, all post-construction stormwater structures, including deep sump catch basins, scuppers, and outlet protection shall be cleaned of construction sediment and any remaining silt fence shall be removed prior to acceptance of the project by the Department. Sediment shall be properly disposed of in accordance with all applicable laws, regulations and guidelines.

Maintaining and Storing Vehicles and Equipment

The Contractor shall take measures to prevent any contamination to wetlands and watercourses while maintaining and storing construction equipment on the site. All chemical and petroleum containers stored on site shall be provided with impermeable containment which will hold at least 110% of the volume of the largest container, or 10% of the total volume of all containers in the area, whichever is larger, without overflow from the containment area. All chemicals and their containers shall be stored under a roofed area except for those stored in containers of 100 gallon capacity or more, in which case double-walled tanks will suffice.

7. Inspections

All construction activities shall be inspected initially within the first 30 days, for Plan implementation and then weekly for Routine Inspections.

The Permittee will maintain a rain gauge on-site to document rainfall amounts. During construction, all areas disturbed by the construction activity that have not been stabilized, all erosion and sedimentation control measures, all structural control measures, soil stockpile areas, washout areas and locations where vehicles enter or exit the site shall be inspected for evidence of, or the potential for, pollutants entering the drainage system and impacts to receiving waters at least once every seven calendar days and within 24 hours of the end of a storm that generates a discharge.

For storms that end on a weekend, holiday or other time in which working hours will not commence within 24 hours, an inspection is required within 24 hours only for storms that equal or exceed 0.5 inches. For lesser storms, inspection shall occur immediately upon the start of subsequent normal working hours.

Where sites have been temporarily or finally stabilized, such inspection shall be conducted at least once every month for three months. For the final stabilization inspection, once the site has been stabilized for at least three (3) months, such inspection shall be by a qualified inspector to confirm final stabilization and compliance indicated on the Notice of Termination form.

The following items shall be inspected as described below:

<u>Item</u>	<u>Procedure</u>
Sedimentation Control System (SCS)	The SCS shall be inspected to ensure that the fence line is intact with no breaks or tears. The fence shall be firmly anchored to the ground. Areas where the fence is excessively sagging or where support posts are broken or uprooted shall be noted. Depth of sediment behind the fence shall be noted.
Concrete Washout Area	Containers or pits shall be inspected at least once a week to ensure structural integrity, adequate holding capacity and will be repaired prior to future use if leaks are present. The contractor shall remove hardened concrete waste when it accumulates to a height of ½ of the container or pit or as necessary to avoid overflows. All concrete waste shall be disposed of in a manner consistent with all applicable laws, regulations and guidelines.
Catch Basin Protection	Protective measures shall be inspected to ensure that sediment is not entering the catch basins. Catch basin sumps shall be monitored for sediment deposition. Hay bales shall be inspected to ensure they have not clogged.

Anti-tracking Pad	Locations where vehicles enter or exit the site shall be inspected for evidence of off-site tracking.
Dust Control	Measures shall be taken for the purpose of allaying (diminishing) dust conditions. Measures may include the use of sweeping equipment and/or the application of water or calcium chloride.
General	Construction areas and the perimeter of the site shall be inspected for any evidence of debris that may blow or wash off site or that has blown or washed off site. Construction areas shall be inspected for any spills or unsafe storage of materials that could pollute off site waters.

8. Keeping Plans Current

The Department shall amend the Plan if the actions required by the Plan fail to prevent pollution or otherwise comply with provisions of the General Permit. The Plan shall also be amended whenever there is a change in contractors or sub-contractors at the site. If the results of the inspections require modifications to the Stormwater Pollution Control Plan, the plans shall be revised as soon as practicable after the inspection. Such modifications shall provide for a timely implementation of any changes to non-engineered controls on the site within 24 hours and implementation of any changes to the plan within 3 (three) calendar days following the inspection. For Engineered measures, corrective actions shall be implemented on site within 7 (seven) days and incorporated into a revised Plan within 10 (ten) days of the date of inspection

In no event shall the requirements to keep the Plan current or update a Plan, relieve the permittee and their contractor(s) of the responsibility to properly implement any actions required to protect the waters of the State and to comply with all conditions of the permit.

9. Monitoring Requirements

A written report summarizing the scope of the inspection, the name(s) and qualifications of inspection personnel, the date and time of the inspection, major observations relative to the implementation of the Pollution Control Plan, and actions taken shall be completed within 24 hours of the inspection. This report shall be retained as part of the Stormwater Pollution Control Plan for at least five years after the date of the inspection.

Sampling is required of all point source discharges of Stormwater from disturbed areas. All sampling points should be clearly marked in the field with flags, stakes or other visible markers.

Where there are 2 or more discharge points that discharge substantially identical runoff based on similarities of the exposed soils, slope and type of stormwater controls used, up to 5 substantially identical outfalls may be identified for one representative discharge. For linear projects, 10 substantially identical outfalls may be identified for one representative discharge. Additionally, if the project is planned to continue for more than one year, the inspector as designated by the permittee shall rotate twice per year the location where samples are taken so that a different discharge point is sampled every six months. The outfall locations for sampling will be identified by the inspector, based on disturbance and approved by the engineer and the SWPCP revised as appropriate.

Turbidity monitoring shall be conducted utilizing the drainage plans and a procedure consistent with 40 CFR Part 136 (http://www.epa.gov/region9/qa/pdfs/40cfr136_03.pdf) and may be taken manually or by an in-situ turbidity probe or other automatic sampling device equipped to take individual turbidity readings. The first sample shall be taken within the first hour of stormwater discharge from the site and at least three grab samples shall be taken during a storm event and shall be representative of the flow and characteristics of the discharge. Sampling shall be conducted at least monthly when there is a discharge of stormwater from the site while construction activity is ongoing, until final stabilization of the drainage area associated with each outfall is achieved.

Samples shall be taken during normal working hours, which for this project shall be defined as Monday through Friday, 7 am to 7 pm. If a storm continues past working hours, sampling shall resume the following morning or the morning of the next working day following a weekend or Holiday, as long as the discharge continues. Sampling may be temporarily suspended when conditions exist that may reasonably pose a threat to the safety of the person taking the sample.

Within 30 days following the end of each month, the stormwater sampling results shall be submitted on the Stormwater Monitoring Report (SMR) and submit in accordance with Net DMR. If there is no stormwater discharge during a month, sampling is not required, however, SMR's indicating "no discharge" along with the reason, shall still be submitted as required.

10. Contractors

This section shall identify all Contractors and Subcontractors who will perform on site actions which may reasonably be expected to cause or have the potential to cause pollution of the waters of the State. All contractors and subcontractors must sign the attached statement. All certification will be included in the Stormwater Pollution Control Plan.

State Project No. 0096-0201

Rehabilitation of Bridge Nos 01218 & 04180
Newtown/Southbury, CT

“I certify under penalty of law that I have read and understand the terms and conditions of the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. I understand that as Contractor on the project, I am covered by this General Permit, and must comply with the terms and conditions of this permit, including, but not limited to, the requirements of the Stormwater Pollution Control Plan prepared for this project.”

GENERAL CONTRACTOR

Signed:_____

Date:_____

Title:_____

Firm:_____

Telephone:_____

Address:_____

SUBCONTRACTOR

Signed:_____

Date:_____

Title:_____

Firm:_____

Telephone:_____

Address:_____

**Appendix A – Drainage Report, September 2019, prepared by Louis Berger US
with Excerpts from Site Plans**

Appendix B – Stormwater Monitoring Report Form

Appendix C – Notice of Termination Form

Drainage Report
for the
Rehabilitation of Bridge Nos. 01218 & 04180
Interstate 84 over Housatonic River

(Final Design Plans Submission)
September 2019

State Project No. 0096-0201

Federal Aid Project No. 1096 (111)



Prepared For:

State of Connecticut
Department of Transportation
Newington, Connecticut



Prepared By:

Louis Berger US
A WSP Company
55 Capital Boulevard
Rocky Hill, Connecticut

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General

Description of Project: Louis Berger US, a WSP Company, is providing preliminary and final engineering services to the State of Connecticut Department of Transportation for the rehabilitation of Bridge Nos. 01218 & 04180 (also known as the Rochambeau Bridge) carrying Interstate 84 (I-84) over the Housatonic River between the towns of Newtown and Southbury. Both bridges have a curb-to-curb width of 60' which consist of two 12' wide travel lanes and wide shoulders (24' left and 12' right on Bridge 01218, 12' left and 12'-24' right on Bridge 04180). Bridge 01218 also has a 5' exterior sidewalk located along the south (or eastern) side. The total length of both structures is 792'.

The major scope item of this project is the full replacement of the superstructure of both bridges. There are existing scuppers located at the edges of the right and left shoulders which outfall via free fall to the water below. As part of the superstructure replacement, the scuppers shall be replaced. All scuppers shall continue to outfall via free fall to the water below. On the south side the drainage system shall include a water quality swale which will treat the stormflow before ultimately discharging it to a new, adequate outfall along the south slope of the Housatonic River. On the north side, the new closed drainage system will outfall into the existing grassed median. This median will be improved in order to function as a water quality basin. The flow will then discharge into an existing series of pipes and structures, ultimately outfalling along the northern slope of the Housatonic River.

Design Criteria: The design criteria used in the drainage evaluations was obtained from the Connecticut Department of Transportation *Drainage Manual*, January 2000, as revised, unless otherwise noted. The Federal Highway Administration *Hydraulics Design Series* and *Highway Engineering Circulars* were used as directed by the *Drainage Manual*.

The roadway drainage was designed and analyzed for a 10-year storm event. The existing information, including pipe size, inverts and pipe material was taken from a field survey conducted by the Connecticut DOT District 4 Surveyors and dated July 2016. There was one drainage structure and conduit (EX-CB06) without adequate, surveyed information. A conservative assumption about the size of the drainage area (based on LIDAR contours) was used.

Two different sized scuppers have been proposed on structure. The first, used within the roadway, is 1'-8" (L) x 5'-0" (W) size. The second, used within the pedestrian sidewalk located on the eastbound structure (Bridge 01218), is 1'-5 1/8" (L) x 9 1/4" (W). Both connect to 10" diameter PVC downspouts which free fall to the river below.

System Descriptions

On the south side of the project, the portions of the approaches which ultimately flow to Outfall #3 were analyzed as one system. On the north side of the project the approaches which ultimately flow to outfall #7 were analyzed as one system. The scuppers which discharge via free fall, were grouped together by bridge, 04180 and 01218. The systems and outfalls are described below.

Outfall 3

The drainage system leading to Outfall 3 collects storm water runoff from approximately 100' of the westbound roadway (Stations WB 174+50 to 175+50), 350' of the eastbound roadway

(Stations 179+50 to 183+00), and approximately 250' of the grassed median. In the westbound direction 15" reinforced concrete pipes (RCP) connect to additional structures which discharge their flow into the proposed water quality swale (WQS) at station WB 173+40, 70' Rt. In the eastbound direction 15" RCP connects to additional structures which discharge their flow into the WQS at station EB 179+60, 56' Lt.

The new water quality swale has been designed to treat the flows from the areas draining to it before flowing into an endwall and 15" RCP discharge pipe (Outfall 3) at EB 182+11, 51' Lt. The invert of the endwall has been set just above the required water quality volume. The WQS has an 8' bottom width with 3:1 side slopes to allow for maintenance and grass mowing. The typical section of the swale consists of 6" of top soil on 30" of permeable soil on 12" of 3/8" diameter crushed stone. A 6" perforated PVC underdrain will run within the crushed stone layer and outfall along the river bank slope, adjacent to the 15" RCP described above. For additional details of the WQS please see HWY-18 through HWY-20.

A total of 0.776 acres and 2.88 cfs (10-year storm) drain to Outfall 3 in the proposed condition. The appropriate outfall treatment has been specified to ensure a stable and adequate outfall.

Please refer to the attached computations and plans for additional information.

Outfall 7

The drainage system leading to Outfall 7 collects storm water runoff from approximately 1200' of the westbound approach roadway (Stations WB 183+40 to 195+50), 1170' of the eastbound roadway (Stations 189+70 to 201+40), and approximately 1100' of the grassed median. In the westbound direction 15" reinforced concrete pipes (RCP) connect to additional structures which discharge their flow into the grassed median at station WB 184+31, 45' Rt. In the eastbound direction 15" RCP connects to additional structures which discharge their flow into the median at station EB 190+63, 44' Lt.

The existing grassed median will be utilized to function as a water quality basin (WQB). The existing grading of the median is ideal for this function. A new intake structure will replace the existing catch basin (located at EB 193+00, 61' Lt.) which will connect to an existing 15" RCP which ultimately runs to an existing outfall at EB 192+30, 102' Rt. (outfall 7), along the bank of the Housatonic River. The orifice elevation within the intake structure has been set just above the required water quality volume. The basin has side slopes of 3:1 to 4:1, adequate for maintenance and grass mowing. The bottom of the basin has a width of 10' to 15'. For additional details of the sediment basin please see HWY-18 through HWY-20.

A total of 7.51 acres and 14.60 cfs (10-year storm) drain to Outfall 7 in the proposed condition. In the existing condition a total of 7.18 acres drain to Outfall 7. The 0.33-acre increase is due to the collection of stormwater from the approximately 250' of the westbound, north approach roadway.

Based on a site visit, the existing outfall at Roadway Station EB 192+30, 100' Right is eroded and inadequate without remediation measures. Therefore, the construction documents call for the removal and replacement of the last 10' of 24" C.C.M.P., the construction of a new concrete endwall, and the installation of a preformed scour hole. With these improvement measures the outfall will be stable and adequate.

Please refer to the attached computations and plans for additional information.

Bridge 01218 Free-fall Scuppers

The scuppers proposed on Bridge 01218 connect to short, vertical downspout pipes (10" diameter PVC) which discharge directly to the water below. They have been designed and spaced to adequately drain the bridge roadway with a minimal amount of spread.

Please refer to the attached computations and plans for additional information.

Bridge 04180 Free-fall Scuppers

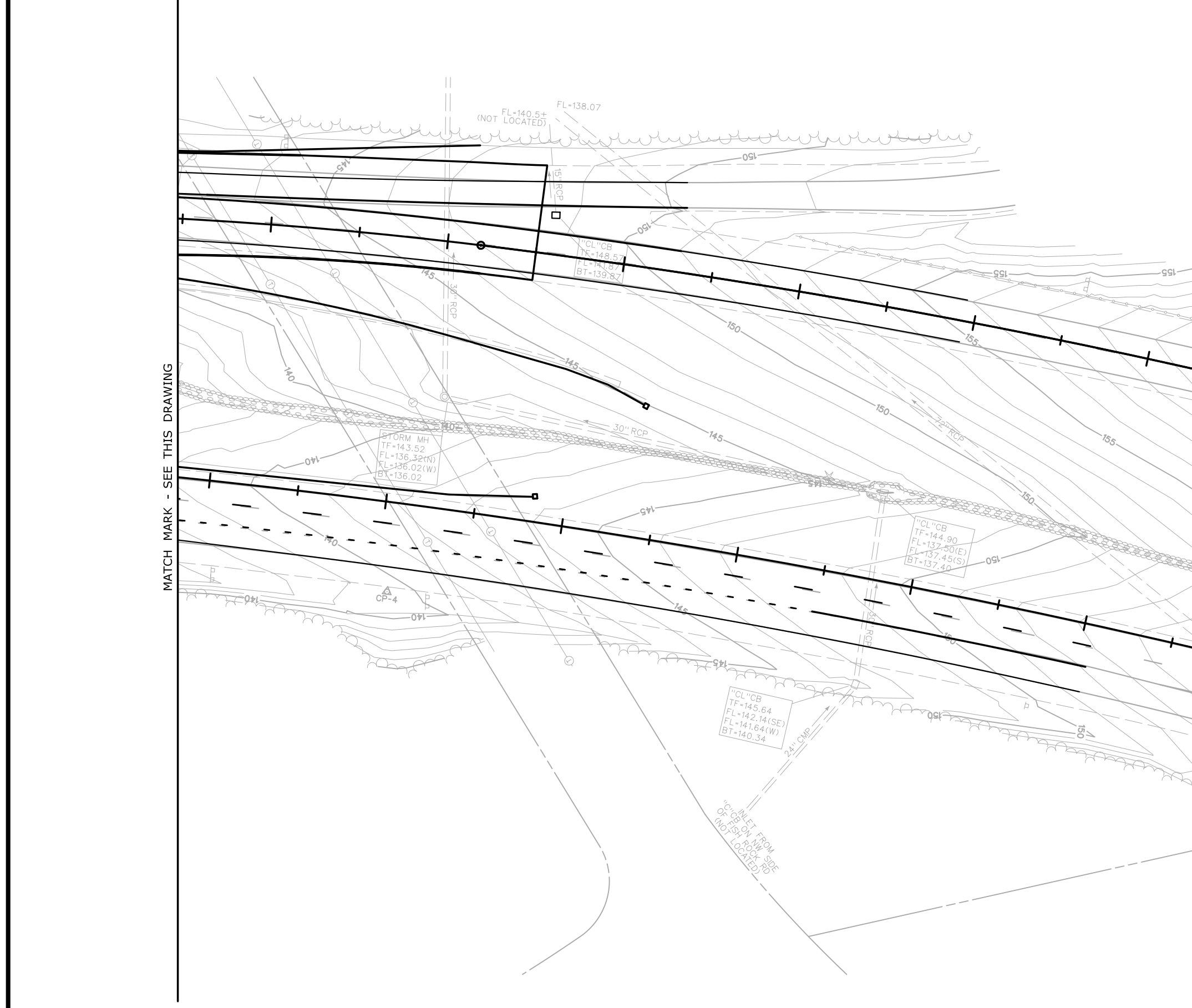
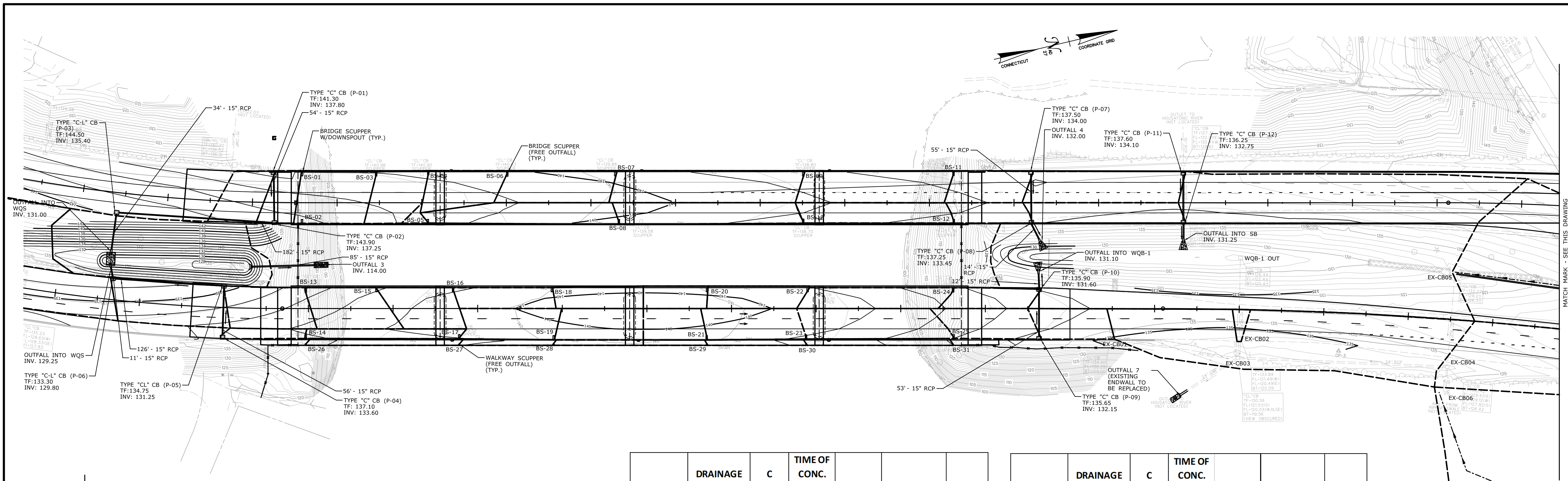
The scuppers proposed on Bridge 04180 connect to short, vertical downspout pipes (10" diameter PVC for the roadway and 8" diameter PVC for sidewalk scuppers) which discharge directly to the water below. They have been designed and spaced to adequately drain the bridge roadway with a minimal amount of spread.

Please refer to the attached computations and plans for additional information.

Existing Pipe Condition

As explained above, Outfall 7 utilizes existing pipe runs. The condition of the existing pipes is an important consideration. Based on a site visit and a visual inspection of the accessible catch basins and manholes the existing systems appear to be in good condition. No in-pipe (video or otherwise) was performed though.

Please see attached condition survey of the existing pipes used as part of the outfalls described above.

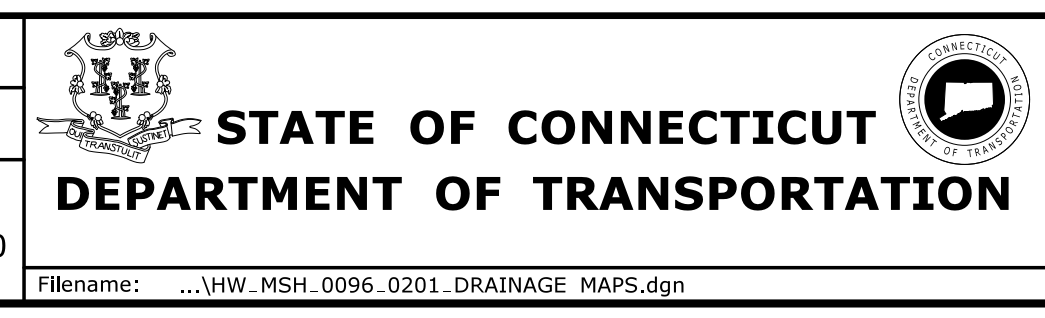


STRUCTURE	DRAINAGE AREA (AC)	C FACTOR	TIME OF CONC. (MIN.)	RIM	STATION	OFFSET
P-01	0.074	0.95	5	141.30	WB 174+24.25	36' LT
P-02	-	-	-	143.90	WB 175+26.35	24' RT
P-03	0.001	0.95	5	144.50	WB 173+41.00	25.55' RT
P-04	0.026	0.95	5	137.10	EB 180+99.20	36' LT
P-05	0.111	0.95	5	134.75	EB 181+00.00	24' RT
P-06	0.155	0.95	5	133.30	EB 179+66.00	25.20' LT
WQS-1	0.409	0.50	5			
P-07	0.079	0.95	5	137.50	WB 184+20.00	36' LT
P-08	0.051	0.95	5	137.25	WB 184+20.78	24' RT
P-09	0.123	0.95	5	135.65	EB 190+63.40	36' RT
P-10	0.080	0.95	5	135.90	EB 190+63.60	23.36' LT
P-11	0.100	0.95	5	137.60	WB 186+00.00	36' LT
P-12	0.155	0.95	5	136.25	WB 186+00.00	24' RT
P-13	1.506	0.5	8.58	137.25	EB 197+38.00	45.70' LT
WQB-1	1.803	0.554	12.48			
EX-CB01	0.074	0.95	5	134.60	EB 191+50.3	36' RT
EX-CB02	0.011	0.95	5	133.89	EB 193+00.7	34.3' RT
EX-CB03	0.607	0.65	5	130.56	EB 192+99.5	57.3' RT
EX-CB04	0.884	0.75	5	132.42	EB 195+50.6	56.7' RT
EX-CB05	0.540	0.55	7.5	132.27	EB 195+51.2	54.2' LT
EX-CB06	1.500	0.4	16.08	140.00	UNKNOWN	-
BS-01	0.053	0.95	5	141.00	WB 175+59.00	36' LT
BS-02	-	-	-	143.30	WB 175+59.00	24' RT
BS-03	0.122	0.95	5	141.01	WB 176+46.00	36' LT
BS-04	0.083	0.95	5	140.69	WB 177+08.00	36' LT
BS-05	0.007	0.95	5	141.57	WB 177+08.00	24' RT
BS-06	0.089	0.95	5	140.20	WB 178+01.00	36' RT
BS-07	0.115	0.95	5	139.51	WB 179+29.00	36' LT
BS-08	0.118	0.95	5	139.70	WB 179+33.00	36' LT
BS-09	0.192	0.95	5	138.28	WB 181+51.00	24' RT
BS-10	0.125	0.95	5	138.54	WB 181+51.00	24' RT
BS-11	0.151	0.95	5	137.33	WB 183+28.50	36' LT
BS-12	0.096	0.95	5	137.64	WB 183+28.50	24' RT

STRUCTURE	DRAINAGE AREA (AC)	C FACTOR	TIME OF CONC. (MIN.)	RIM	STATION	OFFSET
BS-13	0.105	0.95	5	136.50	EB 181+97.00	24' LT
BS-14	0.049	0.95	5	137.80	EB 181+97.00	36' RT
BS-15	0.092	0.95	5	137.90	EB 182+80.00	24' LT
BS-16	0.066	0.95	5	138.80	EB 183+71.00	24' LT
BS-17	0.094	0.95	5	139.00	EB 183+78.00	36' RT
BS-18	0.062	0.95	5	139.56	EB 184+87.70	24' LT
BS-19	0.086	0.95	5	139.31	EB 184+90.00	36' RT
BS-20	0.046	0.95	5	139.69	EB 186+71.00	24' LT
BS-21	0.061	0.95	5	139.45	EB 186+71.00	36' RT
BS-22	0.069	0.95	5	139.08	EB 187+90.00	24' LT
BS-23	0.097	0.95	5	138.87	EB 187+90.00	36' RT
BS-24	0.096	0.95	5	137.25	EB 189+62.00	24' LT
BS-25	0.137	0.95	5	137.10	EB 189+62.00	36' RT
BS-26	0.033	0.95	5	137.80	EB 181+97.00	42' RT
BS-27	0.018	0.95	5	139.00	EB 183+78.00	42' RT
BS-28	0.016	0.95	5	139.34	EB 184+90.00	42' RT
BS-29	0.011	0.95	5	139.45	EB 186+71.00	42' RT
BS-30	0.019	0.95	5	138.83	EB 187+90.00	42' RT
BS-31	0.031	0.95	5	137.10	EB 189+62.00	42' RT

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

DESIGNER/DRAFTER:
M. MOSLEY
CHECKED BY:
S. SUEHR
SCALE IN FEET
0 60 120
SCALE 1"=60'



SIGNATURE/BLOCK:

LOUIS BERGER, US
A WSP COMPANY
55 CAPITAL BOULEVARD
ROCKY HILL, CT 06067

PROJECT TITLE:
**REHABILITATION OF BRIDGE NOS
01218 & 04180 - I-84 EB/WB
OVER HOUSATONIC RIVER**

TOWN: **NEWTOWN/SOUTHBURY**
DRAWING TITLE:
DRAINAGE AREA MAP

PROJECT NO.: **96-201**
DRAWING NO.:
SHEET NO.:

FlexTable: Catchment Table

ID	Label	Outflow Element	Area (User Defined) (acres)	Runoff Coefficient (Rational)	Time of Concentration (Composite) (hours)	Flow (Total Out) (cfs)	Notes
124	P-04 DA	P-04	0.026	0.950	0.083	0.18	
125	P-05 DA	P-05	0.111	0.950	0.083	0.78	
127	P-06 DA	P-06	0.155	0.950	0.083	1.09	
142	P-01 DA	P-01	0.074	0.950	0.083	0.52	
143	P-02 DA	P-02	0.000	0.950	0.083	0.00	
177	WQS-1 DA	WQS-IN	0.409	0.500	0.083	1.52	
181	P-03 DA	P-03	0.001	0.950	0.083	0.01	NO DA TO CB

FlexTable: Catch Basin Table

ID	Label	Elevation (Ground) (ft)	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Length (ft)	Width (ft)	Inlet Type	Inlet
119	P-04	137.10	137.10	133.60	4.00	3.00	Catalog Inlet	Combination Type C Single Grate - Grate Type B - Plain Curb
120	P-05	134.75	134.75	131.25	4.00	3.00	Catalog Inlet	Combination Type C Single Grate - Grate Type B - Plain Curb
122	P-06	133.30	133.30	129.80	4.00	3.00	Catalog Inlet	Combination Type C Single Grate - Grate Type B - Plain Curb
138	P-01	141.30	141.30	133.80	4.00	3.00	Catalog Inlet	Combination Type C Single Grate - Grate Type B - Plain Curb
139	P-02	143.90	143.90	133.25	4.00	3.00	Catalog Inlet	Combination Type C Single Grate - Grate Type B - Plain Curb
180	P-03	144.50	144.50	131.40	4.00	3.00	Catalog Inlet	Grate Type C-L Single Grate - Grate Type A

Manning's n (Inlet)	Capture Efficiency (Calculated) (%)	Longitudinal Slope (Inlet) (ft/ft)	Road Cross Slope (ft/ft)	Flow (Captured) (cfs)	Hydraulic Grade Line (In) (ft)	Spread / Top Width (ft)
0.015	89.2	0.013	0.020	0.16	133.76	3.5
0.015	92.3	0.013	0.060	0.72	131.62	3.1
0.015	64.2	0.013	0.020	0.70	130.29	6.9
0.015	89.4	0.009	0.040	0.47	138.07	3.7
0.015	100.0	0.009	0.040	0.00	137.51	0.0
0.015	100.0	0.009	0.020	0.01	135.66	1.1

Conduit FlexTable: Combined Pipe/Node Report

Label	Start Node	Stop Node	Upstream Inlet C	System Intensity (in/h)	Upstream Inlet Area (acres)	Upstream Structure Flow (Total Surface) (cfs)	System CA (acres)	System Drainage Area (ft ²)	System Rational Flow (cfs)	Flow (cfs)	Diameter (in)	Length (Unified) (ft)	Velocity (ft/s)	Capacity (Full Flow) (cfs)
P-04 TO P-05	P-04	P-05	0.950	7.370	0.026	0.18	0.022	1,132.6	0.16	0.16	15.0	56.0	3.69	13.23
P-05 TO P-06	P-05	P-06	0.950	7.261	0.111	0.78	0.119	5,967.7	0.87	0.87	15.0	126.0	3.86	6.93
P-01 TO P-02	P-01	P-02	0.950	7.370	0.074	0.52	0.063	3,223.4	0.47	0.47	15.0	54.0	3.08	6.52
P-02 TO P-03	P-02	P-03	0.950	7.244	0.000	0.00	0.063	3,223.4	0.46	0.46	15.0	182.0	3.06	6.51
P-03 TO O-2	P-03	WQS-IN	0.950	6.819	0.001	0.01	0.064	3,267.0	0.44	0.44	15.0	34.0	7.36	23.24
P-06 TO O-1	P-06	WQS-IN	0.950	7.028	0.155	1.09	0.214	12,719.5	1.52	1.52	15.0	28.7	6.84	12.36
WQS TO O-3	WQS OUT	O-3	(N/A)	5.923	(N/A)	0.00	0.482	33,802.6	2.88	2.88	15.0	85.0	13.86	25.74

Invert (Start) (ft)	Invert (Stop) (ft)	Slope (Calculated) (ft/ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
133.60	131.25	0.042	133.76	131.62
131.25	129.80	0.012	131.62	130.29
137.80	137.25	0.010	138.07	137.48
137.25	135.40	0.010	137.51	135.62
135.40	131.00	0.129	135.66	131.12
129.80	128.75	0.037	130.29	129.05
127.50	114.00	0.159	128.18	114.28

WQS-1

<General>			
ID	161	Hyperlinks	<Collection: 0 items>
Label	WQS-1	Start Node	WQS-IN
Notes		Stop Node	WQS OUT

GIS-IDs

GIS-ID

Geometry

X (ft)	Y (ft)
-126.74	-25.96
-46.92	-26.44

Active Topology	
Is Active?	True

Physical			
Set Invert to Start?	True	Length (User Defined)	170.0 ft
Invert (Start)	128.75 ft	Length (Unified)	170.0 ft
Set Invert to Stop?	True	Slope (Calculated)	0.007 ft/ft
Invert (Stop)	127.50 ft	Bend Angle (Calculated)	0.34 degrees
Has User Defined Length?	True		

Results (Engine Parsing)			
Branch ID	1	Subnetwork Outfall	O-3

Results (Flow)			
Flow	3.30 cfs	Flow (Total Lateral Inflow)	0.00 cfs

Results (Hydraulic Summary)			
Velocity	1.41 ft/s	Depth (Normal) / Rise	8.9 %
Depth (Normal)	0.27 ft	Friction Slope	0.005 ft/ft
Depth (Critical)	0.17 ft	Area (Full Flow)	(N/A) ft ²
Froude Number (Normal)	0.504		

WQS-1

Results (Profile Summary)

Profile Description	M1	Has Hydraulic Jump?	False
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Results (Profile)

Depth (In)	0.27 ft	Hydraulic Grade Line (In)	129.02 ft
Depth (Out)	0.68 ft	Hydraulic Grade Line (Out)	128.18 ft
Energy Grade Line (In)	129.05 ft	Headloss	0.83 ft
Energy Grade Line (Out)	128.19 ft		

Results

Depth/Rise	15.8 %	Velocity (In)	1.41 ft/s
Rise (Unified)	3.00 ft	Velocity (Out)	0.48 ft/s

Calculation Messages

Time (hours)	Message
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Conduit FlexTable: DOT Report

Label	-Node- Upstream Downstream	-Depth- Upstream Downstream (ft)	-EGL- Upstream Downstream (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Invert- Upstream Downstream (ft)	Section Discharge Capacity (cfs)	-X- Upstream Downstream (ft)	-Y- Upstream Downstream (ft)
P-04 TO P-05	P-04	0.16	133.81	137.10	133.76	133.60	0.16	-57.59	-76.80
	P-05	0.37	131.62	134.75	131.62	131.25	13.23	-58.24	-56.18
P-05 TO P-06	P-05	0.37	131.75	134.75	131.62	131.25	0.87	-58.24	-56.18
	P-06	0.49	130.35	133.30	130.29	129.80	6.93	-126.67	-54.65
P-01 TO P-02	P-01	4.27	138.16	141.30	138.07	133.80	0.47	-57.66	20.64
	P-02	4.26	137.66	143.90	137.48	133.25	6.52	-57.39	-5.59
P-02 TO P-03	P-02	4.26	137.61	143.90	137.51	133.25	0.46	-57.39	-5.59
	P-03	4.26	135.80	144.50	135.62	131.40	6.51	-125.82	-4.07
P-03 TO O-2	P-03	4.26	135.75	144.50	135.66	131.40	0.44	-125.82	-4.07
	WQS-IN	0.27	129.72	132.00	131.12		23.24	-126.74	-25.96
P-06 TO O-1	P-06	0.49	130.47	133.30	130.29	129.80	1.52	-126.67	-54.65
	WQS-IN	0.27	129.72	132.00	129.05		12.36	-126.74	-25.96
WQS TO O-3	WQS OUT	0.68	128.46	132.00	128.18		2.88	-46.92	-26.44
	O-3	(N/A)	(N/A)	115.25	114.28	114.00	25.74	-10.90	-26.44

Conduit FlexTable: HEC-22 Table A

Label	Upstream Structure	Rise (Unified) (ft)	Flow (cfs)	Length (Unified) (ft)	Velocity (ft/s)	Depth (Normal) (ft)	Depth (Critical) (ft)	Upstream Structure Velocity Head (In-Governing) (ft)	Friction Slope (ft/ft)	Headloss (ft)	Energy Grade Line (In) (ft)
P-04 TO P-05	P-04	1.25	0.16	56.0	3.69	0.10	0.16	0.05	0.039	2.14	133.81
P-05 TO P-06	P-05	1.25	0.87	126.0	3.86	0.30	0.37	0.13	0.011	1.33	131.75
P-01 TO P-02	P-01	1.25	0.47	54.0	3.08	0.23	0.27	0.09	0.010	0.59	138.16
P-02 TO P-03	P-02	1.25	0.46	182.0	3.06	0.22	0.26	0.09	0.010	1.89	137.61
P-03 TO O-2	P-03	1.25	0.44	34.0	7.36	0.12	0.26	0.09	0.111	4.54	135.75
P-06 TO O-1	P-06	1.25	1.52	28.7	6.84	0.30	0.49	0.18	0.025	1.24	130.47
WQS TO O-3	WQS OUT	1.25	2.88	85.0	13.86	0.28	0.68	0.27	0.132	13.90	128.46
Upstream Structure Headloss Coefficient	Upstream Structure Headloss (ft)	Upstream Structure Energy Grade Line (In) (ft)	Upstream Structure Hydraulic Grade Line (In) (ft)	Elevation Crown (Start) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Elevation Ground (Start) (ft)				
1.000	0.00	133.81	133.76	134.85	133.76	131.62	137.10				
1.000	0.00	131.62	131.62	132.50	131.62	130.29	134.75				
1.000	0.00	138.16	138.07	139.05	138.07	137.48	141.30				
1.000	0.00	137.66	137.51	138.50	137.51	135.62	143.90				
1.000	0.00	135.80	135.66	136.65	135.66	131.12	144.50				
1.000	0.00	130.35	130.29	131.05	130.29	129.05	133.30				
1.000	0.00	128.19	128.18	128.75	128.18	114.28	132.00				

FlexTable: Catchment Table

ID	Label	Outflow Element	Area (User Defined) (acres)	Runoff Coefficient (Rational)	Time of Concentration (Composite) (hours)	Flow (Total Out) (cfs)	Notes
76	P-08 DA	P-08	0.051	0.950	0.083	0.36	
78	P-07 DA	P-07	0.079	0.950	0.083	0.56	
149	P-10 DA	P-10	0.080	0.950	0.083	0.56	
150	P-09 DA	P-09	0.123	0.950	0.083	0.87	
159	P-12 DA	P-12	0.155	0.950	0.083	1.09	
160	P-11 DA	P-11	0.100	0.950	0.083	0.71	
165	P-13 DA	P-13	1.506	0.500	0.143	4.43	
166	EX-CB05 DA	EX-CB05	0.540	0.550	0.125	1.89	
167	EX-CB04 DA	EX-CB04	0.884	0.750	0.083	4.92	
168	EX-CB03 DA	EX-CB03	0.607	0.650	0.083	2.93	
169	EX-CB02 DA	EX-CB02	0.011	0.950	0.083	0.08	
170	EX-CB01 DA	EX-CB01	0.074	0.950	0.083	0.52	
193	EX-CB06	CB-25	1.500	0.400	0.268	2.42	ESTIMATED AREA
194	WQB DA	SB-XSC1	1.803	0.554	0.208	4.69	Direct sheetflow to WQB

FlexTable: Catch Basin Table

ID	Label	Elevation (Ground) (ft)	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Length (ft)	Width (ft)	Inlet Type	Inlet
38	P-08	137.25	137.25	133.45	4.00	3.00	Catalog Inlet	Combination Type C Single Grate - Grate Type A - Plain Curb
40	P-07	137.50	137.50	134.00	4.00	3.00	Catalog Inlet	Combination Type C Single Grate - Grate Type A - Plain Curb
123	EX-CB02	133.89	133.89	120.09	4.00	3.00	Catalog Inlet	Grate Type C-L Single Grate - Grate Type A
125	EX-CB03	130.56	130.56	119.56	4.00	3.00	Catalog Inlet	Grate Type C-L Single Grate - Grate Type A
130	EX-CB01	134.60	134.60	129.60	4.00	3.00	Catalog Inlet	Grate Type C-L Single Grate - Grate Type A
135	EX-CB05	132.27	132.27	126.30	4.00	3.00	Catalog Inlet	Grate Type C-L Single Grate - Grate Type A
136	EX-CB04	132.42	132.42	126.42	4.00	3.00	Catalog Inlet	Grate Type C-L Single Grate - Grate Type A
139	P-13	137.25	137.25	128.30	4.00	4.72	Catalog Inlet	Grate Type C-L Double Grate - Type I - Grate Type A
145	P-10	135.90	135.90	127.60	4.00	3.00	Catalog Inlet	Combination Type C Single Grate - Grate Type A - Plain Curb
146	P-09	135.65	135.65	128.15	4.00	3.00	Catalog Inlet	Combination Type C Single Grate - Grate Type A - Plain Curb
157	P-12	136.25	136.25	128.75	4.00	3.00	Catalog Inlet	Combination Type C Single Grate - Grate Type A - Plain Curb
158	P-11	137.60	137.60	130.10	4.00	3.00	Catalog Inlet	Combination Type C Single Grate - Grate Type A - Plain Curb
186	SB-1 OUT	134.00	126.44	120.40			Full Capture	<None>
191	EX-CB06	140.00	140.00	132.00	4.00	3.00	Full Capture	<None>

Manning's n (Inlet)	Capture Efficiency (Calculated) (%)	Longitudinal Slope (Inlet) (ft/ft)	Road Cross Slope (ft/ft)	Flow (Captured) (cfs)	Hydraulic Grade Line (In) (ft)	Spread / Top Width (ft)
0.015	92.8	0.005	0.040	0.33	133.80	3.5
0.015	88.8	0.005	0.040	0.49	134.27	4.1
0.015	98.8	0.040	0.020	0.08	121.48	2.1
	100.0		0.020	2.93	121.38	15.7
0.015	75.4	0.014	0.020	0.39	130.49	5.2
0.028	57.9	0.025	0.020	1.09	130.76	9.5
0.020	42.5	0.025	0.020	2.09	128.76	12.0
0.028	90.1	0.024	0.100	4.00	133.11	7.1
0.015	88.6	0.005	0.040	0.50	132.03	4.1
0.015	83.9	0.005	0.040	0.73	132.48	4.9
0.015	81.1	0.005	0.040	0.89	133.23	5.3
0.015	86.2	0.005	0.040	0.61	134.40	4.5
	100.0		0.020	0.00	123.39	0.0
	100.0		0.020	2.42	132.59	0.0

Conduit FlexTable: Combined Pipe/Node Report

Label	Start Node	Stop Node	Upstream Inlet C	System Intensity (in/h)	Upstream Inlet Area (acres)	Upstream Structure Flow (Total Surface) (cfs)	System CA (acres)	System Drainage Area (ft ²)	System Rational Flow (cfs)	Flow (cfs)	Diameter (in)	Length (Unified) (ft)	Velocity (ft/s)
P-07 TO P-08	P-07	P-08	0.950	7.370	0.079	0.56	0.067	3,441.2	0.49	0.49	15.0	55.0	3.11
EX-CB02 TO EX-CB03	EX-CB02	EX-CB03	0.950	4.031	0.011	0.08	1.487	104,631.1	6.04	6.04	15.0	19.6	8.67
EX-CB03 TO O-7	EX-CB03	O-7	0.650	3.951	0.607	2.93	3.667	327,266.3	14.60	14.60	24.0	79.4	10.95
EX-CB01 TO EX-CB03	EX-CB01	EX-CB03	0.950	7.370	0.074	0.52	0.053	3,223.4	0.39	0.39	15.0	145.0	5.46
EX-CB05 TO EX-CB04	EX-CB05	EX-CB04	0.550	5.638	0.540	1.89	0.851	89,123.8	4.83	4.83	15.0	107.0	3.94
EX-CB05 TO EX-CB03	EX-CB04	EX-CB03	0.750	3.986	0.884	4.92	1.732	192,970.8	6.96	6.96	24.0	243.0	9.66
P-13 TO EX-CB04	P-13	EX-CB05	0.500	5.840	1.506	4.43	0.679	65,601.4	4.00	4.00	15.0	185.0	6.57
P-09 TO P-10	P-09	P-10	0.950	7.370	0.123	0.87	0.098	5,357.9	0.73	0.73	15.0	53.0	3.53
P-11 TO P-12	P-11	P-12	0.950	7.370	0.100	0.71	0.082	4,356.0	0.61	0.61	15.0	54.0	4.57
P-08 TO SB-01	P-08	SB-XSC1	0.950	7.244	0.051	0.36	0.112	5,662.8	0.81	0.81	15.0	22.0	7.00
P-10 TO SB-01	P-10	SB-XSC1	0.950	7.263	0.080	0.56	0.165	8,842.7	1.21	1.21	15.0	12.0	6.70
P-12 TO SB-01	P-12	SB-XSC2	0.950	7.285	0.155	1.09	0.201	11,107.8	1.48	1.48	15.0	20.0	8.74
SB-1 OUT TO EX-CB02	SB-1 OUT	EX-CB02	(N/A)	4.053	(N/A)	0.00	1.477	104,152.0	6.03	6.03	15.0	92.0	5.95
CO-29	EX-CB06	EX-CB04	0.400	3.999	1.500	2.42	0.600	65,340.0	2.42	2.42	18.0	50.0	5.60

Capacity (Full Flow) (cfs)	Invert (Start) (ft)	Invert (Stop) (ft)	Slope (Calculated) (ft/ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
6.46	134.00	133.45	0.010	134.27	133.80
10.21	120.49	120.00	0.025	121.48	121.38
36.38	120.00	113.00	0.088	121.38	113.88
15.87	130.25	121.50	0.060	130.49	121.64
3.30	129.40	129.12	0.003	130.76	130.01
40.58	127.82	120.00	0.032	128.76	121.38
8.09	132.30	129.40	0.016	133.11	130.76
6.58	132.15	131.60	0.010	132.48	132.03
10.21	134.10	132.75	0.025	134.40	133.23
16.58	133.45	132.00	0.066	133.80	132.19
13.19	131.60	131.10	0.042	132.03	131.38
17.69	132.75	131.25	0.075	133.23	131.50
6.42	122.40	121.49	0.010	123.39	122.45
12.92	132.00	129.42	0.052	132.59	129.86

Multiple Element Report

SB-XSC1

<General>			
ID	178	Notes	
Label	SB-XSC1	Hyperlinks	<Collection: 0 items>

GIS-IDs

GIS-ID

<Geometry>			
X	-163.83 ft	Y	-53.46 ft

Active Topology	
Is Active?	True

Inflow (Wet) Collection

Physical			
Update Ground Elevation from Terrain Model?	False	Bottom Width	9.0 ft
Elevation (Ground)	134.00 ft	Slope (Left Side)	3.250 H:V
Elevation (Invert)	127.75 ft	Slope (Right Side)	3.250 H:V
Cross Section Type	User Defined	Height	6.25 ft
Section Type	Trapezoidal Cross Section	Roughness Type	Single Roughness
Material	Flood plain, cultivated	Manning's n	0.035

Results (Flow)			
Flow (Total Out)	5.99 cfs	Flow (Local from Inflow Collection)	0.00 cfs
Local Inflow?	False		

Results (Hydraulic Summary)	
Velocity	6.02 ft/s

Results (System Flow)	
Areal Reduction Factor	(N/A)

Multiple Element Report

Results

Depth (Node)	0.46 ft	Hydraulic Grade	128.21 ft
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Calculation Messages

Time (hours)	Message
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Multiple Element Report SB-01

<General>			
ID	180	Hyperlinks	<Collection: 0 items>
Label	SB-01	Start Node	SB-XSC1
Notes		Stop Node	SB-XSC2

GIS-IDs

GIS-ID

Geometry

X (ft)	Y (ft)
-163.83	-53.46
-122.13	-53.97

Active Topology	
Is Active?	True

Physical			
Set Invert to Start?	True	Length (User Defined)	175.0 ft
Invert (Start)	127.75 ft	Length (Unified)	175.0 ft
Set Invert to Stop?	True	Slope (Calculated)	0.003 ft/ft
Invert (Stop)	127.25 ft	Bend Angle (Calculated)	24.54 degrees
Has User Defined Length?	True		

Results (Engine Parsing)			
Branch ID	1	Subnetwork Outfall	O-7

Results (Flow)			
Flow	5.99 cfs	Flow (Total Lateral Inflow)	0.00 cfs

Results (Hydraulic Summary)			
Velocity	1.23 ft/s	Depth (Normal) / Rise	7.4 %
Depth (Normal)	0.46 ft	Friction Slope	0.004 ft/ft
Depth (Critical)	0.23 ft	Area (Full Flow)	(N/A) ft ²
Froude Number (Normal)	0.341		

Multiple Element Report

Results (Hydraulic Summary)

Results (Profile Summary)

Profile Description	M2	Has Hydraulic Jump?	False
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Results (Profile)

Depth (In)	0.46 ft	Hydraulic Grade Line (In)	128.21 ft
Depth (Out)	0.32 ft	Hydraulic Grade Line (Out)	127.57 ft
Energy Grade Line (In)	128.24 ft	Headloss	0.65 ft
Energy Grade Line (Out)	127.62 ft		

Results

Depth/Rise	6.2 %	Velocity (In)	1.23 ft/s
Rise (Unified)	6.25 ft	Velocity (Out)	1.88 ft/s

Calculation Messages

Time (hours)	Message
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Multiple Element Report

SB-XSC2

<General>			
ID	179	Notes	
Label	SB-XSC2	Hyperlinks	<Collection: 0 items>

GIS-IDs

GIS-ID

<Geometry>			
X	-122.13 ft	Y	-53.97 ft

Active Topology	
Is Active?	True

Inflow (Wet) Collection

Physical			
Update Ground Elevation from Terrain Model?	True	Bottom Width	9.0 ft
Elevation (Ground)	134.00 ft	Slope (Left Side)	3.250 H:V
Elevation (Invert)	127.25 ft	Slope (Right Side)	3.250 H:V
Cross Section Type	User Defined	Height	7.00 ft
Section Type	Trapezoidal Cross Section	Roughness Type	Single Roughness
Material	Flood plain, cultivated	Manning's n	0.035

Results (Flow)			
Flow (Total Out)	6.14 cfs	Flow (Local from Inflow Collection)	0.00 cfs
Local Inflow?	False		

Results (Hydraulic Summary)	
Velocity	1.88 ft/s

Results (System Flow)	
Areal Reduction Factor	(N/A)

Multiple Element Report

Results

Depth (Node)	0.32 ft	Hydraulic Grade	127.57 ft
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Calculation Messages

Time (hours)	Message
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Multiple Element Report

SB-01A

<General>			
ID	187	Hyperlinks	<Collection: 0 items>
Label	SB-01A	Start Node	SB-XSC2
Notes		Stop Node	SB-1 OUT

GIS-IDs

GIS-ID

Geometry

X (ft)	Y (ft)
-122.13	-53.97
-106.58	-53.97

Active Topology	
Is Active?	True

Physical			
Set Invert to Start?	True	Length (User Defined)	68.0 ft
Invert (Start)	127.25 ft	Length (Unified)	68.0 ft
Set Invert to Stop?	False	Slope (Calculated)	0.011 ft/ft
Invert (Stop)	126.50 ft	Bend Angle (Calculated)	90.05 degrees
Has User Defined Length?	True		

Results (Engine Parsing)			
Branch ID	1	Subnetwork Outfall	O-7

Results (Flow)			
Flow	6.14 cfs	Flow (Total Lateral Inflow)	0.00 cfs

Results (Hydraulic Summary)			
Velocity	1.93 ft/s	Depth (Normal) / Rise	4.5 %
Depth (Normal)	0.32 ft	Friction Slope	0.011 ft/ft
Depth (Critical)	0.24 ft	Area (Full Flow)	(N/A) ft ²
Froude Number (Normal)	0.635		

Multiple Element Report

Results (Hydraulic Summary)

Results (Profile Summary)

Profile Description	M2	Has Hydraulic Jump?	False
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Results (Profile)

Depth (In)	0.32 ft	Hydraulic Grade Line (In)	127.57 ft
Depth (Out)	0.24 ft	Hydraulic Grade Line (Out)	126.74 ft
Energy Grade Line (In)	127.62 ft	Headloss	0.83 ft
Energy Grade Line (Out)	126.85 ft		

Results

Depth/Rise	4.0 %	Velocity (In)	1.93 ft/s
Rise (Unified)	7.00 ft	Velocity (Out)	2.66 ft/s

Calculation Messages

Time (hours)	Message
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Multiple Element Report

SB-XSC1

<General>			
ID	178	Notes	
Label	SB-XSC1	Hyperlinks	<Collection: 0 items>

GIS-IDs

GIS-ID

<Geometry>			
X	-163.83 ft	Y	-53.46 ft

Active Topology	
Is Active?	True

Inflow (Wet) Collection

Physical			
Update Ground Elevation from Terrain Model?	False	Bottom Width	9.0 ft
Elevation (Ground)	134.00 ft	Slope (Left Side)	3.250 H:V
Elevation (Invert)	127.75 ft	Slope (Right Side)	3.250 H:V
Cross Section Type	User Defined	Height	6.25 ft
Section Type	Trapezoidal Cross Section	Roughness Type	Single Roughness
Material	Flood plain, cultivated	Manning's n	0.035

Results (Flow)			
Flow (Total Out)	5.99 cfs	Flow (Local from Inflow Collection)	0.00 cfs
Local Inflow?	False		

Results (Hydraulic Summary)	
Velocity	6.02 ft/s

Results (System Flow)	
Areal Reduction Factor	(N/A)

Multiple Element Report

Results

Depth (Node)	0.46 ft	Hydraulic Grade	128.21 ft
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Calculation Messages

Time (hours)	Message
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Conduit FlexTable: DOT Report

Label	-Node- Upstream Downstream	-Depth- Upstream Downstream (ft)	-EGL- Upstream Downstream (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Invert- Upstream Downstream (ft)	Section Discharge Capacity (cfs)	-X- Upstream Downstream (ft)	-Y- Upstream Downstream (ft)
P-07 TO P-08	P-07	0.27	134.37	137.50	134.27	134.00	0.49	-173.24	-0.44
	P-08	0.35	133.85	137.25	133.80	133.45	6.46	-173.01	-30.26
EX-CB02 TO EX-CB03	EX-CB02	1.39	122.00	133.89	121.48	120.09	6.04	-106.61	-89.96
	EX-CB03	1.82	121.75	130.56	121.38	119.56	10.21	-106.61	-106.78
EX-CB03 TO O-7	EX-CB03	1.82	122.00	130.56	121.38	119.56	14.60	-106.61	-106.78
	O-7	(N/A)	(N/A)	115.00	113.88	113.00	36.38	-144.60	-130.99
EX-CB01 TO EX-CB03	EX-CB01	0.89	130.58	134.60	130.49	129.60	0.39	-133.33	-97.14
	EX-CB03	1.82	121.75	130.56	121.64	119.56	15.87	-106.61	-106.78
EX-CB05 TO EX-CB04	EX-CB05	4.46	131.00	132.27	130.76	126.30	4.83	-40.97	-54.22
	EX-CB04	2.34	129.24	132.42	130.01	126.42	3.30	-42.45	-108.06
EX-CB05 TO EX-CB03	EX-CB04	2.34	129.12	132.42	128.76	126.42	6.96	-42.45	-108.06
	EX-CB03	1.82	121.75	130.56	121.38	119.56	40.58	-106.61	-106.78
P-13 TO EX-CB04	P-13	4.81	133.46	137.25	133.11	128.30	4.00	7.39	-54.91
	EX-CB05	4.46	130.93	132.27	130.76	126.30	8.09	-40.97	-54.22
P-09 TO P-10	P-09	4.33	132.60	135.65	132.48	128.15	0.73	-161.90	-111.36
	P-10	4.43	132.09	135.90	132.03	127.60	6.58	-162.75	-79.45
P-11 TO P-12	P-11	4.30	134.51	137.60	134.40	130.10	0.61	-123.21	-0.54
	P-12	4.48	133.26	136.25	133.23	128.75	10.21	-122.98	-30.35
P-08 TO SB-01	P-08	0.35	133.93	137.25	133.80	133.45	0.81	-173.01	-30.26
	SB-XSC1	0.46	128.78	134.00	132.19	133.45	16.58	-163.83	-53.46
P-10 TO SB-01	P-10	4.43	132.19	135.90	132.03	127.60	1.21	-162.75	-79.45
	SB-XSC1	0.46	128.78	134.00	131.38	133.45	13.19	-163.83	-53.46
P-12 TO SB-01	P-12	4.48	133.41	136.25	133.23	128.75	1.48	-122.98	-30.35
	SB-XSC2	0.32	127.62	134.00	131.50	133.45	17.69	-122.13	-53.97
SB-1 OUT TO EX-CB02	SB-1 OUT	2.99	123.91	134.00	123.39	120.40	6.03	-106.58	-53.97
	EX-CB02	1.39	122.03	133.89	122.45	120.09	6.42	-106.61	-89.96
CO-29	EX-CB06	0.59	132.81	140.00	132.59	132.00	2.42	-40.26	-128.74
	EX-CB04	2.34	129.24	132.42	129.86	126.42	12.92	-42.45	-108.06

Conduit FlexTable: HEC-22 Table A

Label	Upstream Structure	Rise (Unified) (ft)	Flow (cfs)	Length (Unified) (ft)	Velocity (ft/s)	Depth (Normal) (ft)	Depth (Critical) (ft)	Upstream Structure Velocity Head (In-Governing) (ft)	Friction Slope (ft/ft)	Headloss (ft)	Energy Grade Line (In) (ft)
P-07 TO P-08	P-07	1.25	0.49	55.0	3.11	0.23	0.27	0.10	0.009	0.47	134.37
EX-CB02 TO EX-CB03	EX-CB02	1.25	6.04	19.6	8.67	0.69	0.99	0.52	0.013	0.11	122.00
EX-CB03 TO O-7	EX-CB03	2.00	14.60	79.4	10.95	0.88	1.38	0.62	0.079	7.50	122.00
EX-CB01 TO EX-CB03	EX-CB01	1.25	0.39	145.0	5.46	0.14	0.24	0.09	0.058	8.86	130.58
EX-CB05 TO EX-CB04	EX-CB05	1.25	4.83	107.0	3.94	(N/A)	0.89	0.24	0.005	0.75	131.00
EX-CB05 TO EX-CB03	EX-CB04	2.00	6.96	243.0	9.66	0.56	0.94	0.36	0.031	7.38	129.12
P-13 TO EX-CB04	P-13	1.25	4.00	185.0	6.57	0.62	0.81	0.35	0.014	2.35	133.46
P-09 TO P-10	P-09	1.25	0.73	53.0	3.53	0.28	0.33	0.12	0.010	0.45	132.60
P-11 TO P-12	P-11	1.25	0.61	54.0	4.57	0.21	0.30	0.11	0.023	1.17	134.51
P-08 TO SB-01	P-08	1.25	0.81	22.0	7.00	0.19	0.35	0.13	0.045	1.62	133.93
P-10 TO SB-01	P-10	1.25	1.21	12.0	6.70	0.26	0.43	0.16	0.021	0.66	132.19
P-12 TO SB-01	P-12	1.25	1.48	20.0	8.74	0.24	0.48	0.18	0.042	1.73	133.41
SB-1 OUT TO EX-CB02	SB-1 OUT	1.25	6.03	92.0	5.95	0.96	0.99	0.52	0.010	0.94	123.91
CO-29	EX-CB06	1.50	2.42	50.0	5.60	0.44	0.59	0.22	0.049	2.73	132.81

Upstream Structure Headloss Coefficient	Upstream Structure Headloss (ft)	Upstream Structure Energy Grade Line (In) (ft)	Upstream Structure Hydraulic Grade Line (In) (ft)	Elevation Crown (Start) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Elevation Ground (Start) (ft)
1.000	0.00	134.37	134.27	135.25	134.27	133.80	137.50
1.000	0.00	122.03	121.48	121.74	121.48	121.38	133.89
1.000	0.00	121.75	121.38	122.00	121.38	113.88	130.56
1.000	0.00	130.58	130.49	131.50	130.49	121.64	134.60
1.000	0.00	130.93	130.76	130.65	130.76	130.01	132.27
1.000	0.00	129.24	128.76	129.82	128.76	121.38	132.42
1.000	0.00	133.46	133.11	133.55	133.11	130.76	137.25
1.000	0.00	132.60	132.48	133.40	132.48	132.03	135.65
1.000	0.00	134.51	134.40	135.35	134.40	133.23	137.60
1.000	0.00	133.85	133.80	134.70	133.80	132.19	137.25
1.000	0.00	132.09	132.03	132.85	132.03	131.38	135.90
1.000	0.00	133.26	133.23	134.00	133.23	131.50	136.25
1.000	0.00	123.50	123.39	123.65	123.39	122.45	134.00
1.000	0.00	132.81	132.59	133.50	132.59	129.86	140.00

FlexTable: Catchment Table

ID	Label	Outflow Element	Area (User Defined) (acres)	Runoff Coefficient (Rational)	Time of Concentration (Composite) (hours)	Flow (Total Out) (cfs)	Notes
213	BS-03 DA	BS-03	0.122	0.950	0.083	0.86	
214	BS-04 DA	BS-04	0.083	0.950	0.083	0.59	
215	BS-05 DA	BS-05	0.007	0.950	0.083	0.05	
228	BS-06 DA	BS-06	0.089	0.950	0.083	0.63	
229	BS-07 DA	BS-07	0.115	0.950	0.083	0.81	
230	BS-09 DA	BS-09	0.192	0.950	0.083	1.35	
231	BS-10 DA	BS-10	0.125	0.950	0.083	0.88	
232	BS-08 DA	BS-08	0.118	0.950	0.083	0.83	
269	BS-02 DA	BS-02	0.000	0.950	0.083	0.00	
270	BS-01 DA	BS-01	0.122	0.950	0.083	0.86	
281	BS-11 DA	BS-11	0.151	0.950	0.083	1.07	
282	BS-12 DA	BS-12	0.096	0.950	0.083	0.68	

FlexTable: Catch Basin Table

ID	Label	Elevation (Ground) (ft)	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Length (ft)	Width (ft)	Inlet Type	Inlet	Manning's n (Inlet)	Capture Efficiency (Calculated) (%)	Longitudinal Slope (Inlet) (ft/ft)
194	BS-03	141.01	141.01	139.01	2.00	5.50	Catalog Inlet	Scupper	0.015	99.9	0.003
197	BS-04	140.69	140.69	138.69	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.006
198	BS-05	141.57	141.57	139.57	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.010
219	BS-06	140.20	140.20	138.20	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.005
220	BS-07	139.51	139.51	137.51	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.006
221	BS-09	138.28	138.28	136.28	2.00	5.50	Catalog Inlet	Scupper	0.015	99.7	0.005
223	BS-08	139.70	139.70	137.70	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.008
224	BS-10	138.54	138.54	136.54	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.005
267	BS-02	143.30	143.30	141.30	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.005
268	BS-01	141.00	141.00	139.00	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.005
277	BS-11	137.33	137.33	135.33	2.00	5.50	Catalog Inlet	Scupper	0.015	93.2	0.005
278	BS-12	137.64	137.64	135.64	2.00	5.50	Catalog Inlet	Scupper	0.015	97.4	0.005

Road Cross Slope (ft/ft)	Flow (Captured) (cfs)	Hydraulic Grade Line (In) (ft)	Spread / Top Width (ft)
0.040	0.86	139.42	5.4
0.040	0.59	139.03	4.2
0.014	0.05	139.66	2.8
0.040	0.63	138.55	4.4
0.040	0.81	137.91	4.7
0.040	1.35	136.80	5.7
0.040	0.83	138.10	4.5
0.040	0.88	136.96	4.9
0.020	0.00	141.30	0.0
0.040	0.86	139.41	4.9
0.020	1.00	135.77	8.2
0.020	0.66	136.00	6.9

Conduit FlexTable: Combined Pipe/Node Report

Label	Start Node	Stop Node	Upstream Inlet C	System Intensity (in/h)	Upstream Inlet Area (acres)	Upstream Structure Flow (Total Surface) (cfs)	System CA (acres)	System Drainage Area (ft ²)	System Rational Flow (cfs)	Flow (cfs)	Diameter (in)	Length (Unified) (ft)	Velocity (ft/s)	Capacity (Full Flow) (cfs)
BS-03 DS	BS-03	BS-03 OUT	0.950	7.369	0.122	0.86	0.116	5,314.3	0.86	0.86	10.0	1.0	29.82	40.28
BS-05 DS	BS-05	BS-05 OUT	0.950	7.370	0.007	0.05	0.007	304.9	0.05	0.05	10.0	1.0	12.57	40.28
BS-04 DS	BS-04	BS-04 OUT	0.950	7.369	0.083	0.59	0.079	3,615.5	0.59	0.59	10.0	1.0	26.64	40.28
BS-06 DS	BS-06	BS-06 OUT	0.950	7.370	0.089	0.63	0.085	3,876.8	0.63	0.63	10.0	1.0	27.17	40.28
BS-07 DS	BS-07	BS-07 OUT	0.950	7.378	0.115	0.81	0.109	5,009.4	0.81	0.81	10.0	1.0	29.31	40.28
BS-09 DS	BS-09	BS-09 OUT	0.950	7.378	0.192	1.35	0.182	8,363.5	1.35	1.35	10.0	1.0	34.21	40.28
BS-08 DS	BS-08	BS-08 OUT	0.950	7.378	0.118	0.83	0.112	5,140.1	0.83	0.83	10.0	1.0	29.53	40.28
BS-10 DS	BS-10	BS-10 OUT	0.950	7.378	0.125	0.88	0.119	5,445.0	0.88	0.88	10.0	1.0	30.05	40.28
BS-01 DS	BS-01	BS-01 OUT	0.950	7.369	0.122	0.86	0.116	5,314.3	0.86	0.86	10.0	1.0	29.83	40.28
BS-02 DS	BS-02	BS-02 OUT	0.950	7.369	0.000	0.00	0.000	0.0	0.00	0.00	10.0	1.0	0.00	40.28
BS-12 DS	BS-12	BS-12 OUT	0.950	7.370	0.096	0.68	0.089	4,181.8	0.66	0.66	10.0	1.0	27.55	40.28
BS-11 DS	BS-11	BS-11 OUT	0.950	7.370	0.151	1.07	0.134	6,577.6	1.00	1.00	10.0	1.0	31.16	40.28

Invert (Start) (ft)	Invert (Stop) (ft)	Slope (Calculated) (ft/ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
139.01	137.01	2.000	139.42	137.17
139.57	137.57	2.000	139.66	137.60
138.69	136.69	2.000	139.03	136.81
138.20	136.20	2.000	138.55	136.33
137.51	135.51	2.000	137.91	135.66
136.28	134.28	2.000	136.80	134.49
137.70	135.70	2.000	138.10	135.85
136.54	134.54	2.000	136.96	134.70
139.00	137.00	2.000	139.41	137.16
141.30	139.30	2.000	141.30	139.30
135.64	133.64	2.000	136.00	133.77
135.33	133.33	2.000	135.77	133.50

Conduit FlexTable: DOT Report

Label	-Node- Upstream Downstream	-Depth- Upstream Downstream (ft)	-EGL- Upstream Downstream (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Invert- Upstream Downstream (ft)	Section Discharge Capacity (cfs)	-X- Upstream Downstream (ft)	-Y- Upstream Downstream (ft)
BS-03 DS	BS-03	0.41	139.58	141.01	139.42	139.01	0.86	-154.37	-59.65
	BS-03 OUT	(N/A)	(N/A)	0.00	137.17	0.00	40.28	-154.50	-67.76
BS-05 DS	BS-05	0.09	139.70	141.57	139.66	139.57	0.05	-115.82	-98.41
	BS-05 OUT	(N/A)	(N/A)	0.00	137.60	0.00	40.28	-116.42	-89.04
BS-04 DS	BS-04	0.34	139.15	140.69	139.03	138.69	0.59	-116.96	-59.28
	BS-04 OUT	(N/A)	(N/A)	0.00	136.81	0.00	40.28	-116.76	-65.69
BS-06 DS	BS-06	0.35	138.68	140.20	138.55	138.20	0.63	-61.80	-59.09
	BS-06 OUT	(N/A)	(N/A)	0.00	136.33	0.00	40.28	-61.76	-65.47
BS-07 DS	BS-07	0.40	138.06	139.51	137.91	137.51	0.81	15.78	-58.79
	BS-07 OUT	(N/A)	(N/A)	0.00	135.66	0.00	40.28	15.99	-65.86
BS-09 DS	BS-09	0.52	137.02	138.28	136.80	136.28	1.35	89.92	-58.75
	BS-09 OUT	(N/A)	(N/A)	0.00	134.49	0.00	40.28	90.29	-64.96
BS-08 DS	BS-08	0.40	138.26	139.70	138.10	137.70	0.83	15.78	-97.68
	BS-08 OUT	(N/A)	(N/A)	0.00	135.85	0.00	40.28	15.82	-87.93
BS-10 DS	BS-10	0.42	137.12	138.54	136.96	136.54	0.88	90.77	-99.00
	BS-10 OUT	(N/A)	(N/A)	0.00	134.70	0.00	40.28	90.46	-89.08
BS-01 DS	BS-01	0.41	139.57	141.00	139.41	139.00	0.86	-184.60	-58.79
	BS-01 OUT	(N/A)	(N/A)	0.00	137.16	0.00	40.28	-184.91	-65.04
BS-02 DS	BS-02	0.00	141.30	143.30	141.30	141.30	0.00	-183.42	-96.55
	BS-02 OUT	(N/A)	(N/A)	0.00	139.30	0.00	40.28	-183.76	-89.71
BS-12 DS	BS-12	0.36	136.13	137.64	136.00	135.64	0.66	136.33	-98.04
	BS-12 OUT	(N/A)	(N/A)	0.00	133.77	0.00	40.28	136.00	-89.16
BS-11 DS	BS-11	0.44	135.95	137.33	135.77	135.33	1.00	136.50	-57.75
	BS-11 OUT	(N/A)	(N/A)	0.00	133.50	0.00	40.28	136.66	-65.97

Conduit FlexTable: HEC-22 Table A

Label	Upstream Structure	Rise (Unified) (ft)	Flow (cfs)	Length (Unified) (ft)	Velocity (ft/s)	Depth (Normal) (ft)	Depth (Critical) (ft)	Upstream Structure Velocity Head (In-Governing) (ft)	Friction Slope (ft/ft)	Headloss (ft)	Energy Grade Line (In) (ft)	Upstream Structure Headloss Coefficient
BS-03 DS	BS-03	0.83	0.86	1.0	29.82	0.08	0.41	0.16	0.079	2.26	139.58	1.000
BS-05 DS	BS-05	0.83	0.05	1.0	12.57	0.02	0.09	0.03	0.530	2.07	139.70	1.000
BS-04 DS	BS-04	0.83	0.59	1.0	26.64	0.07	0.34	0.13	0.102	2.22	139.15	1.000
BS-06 DS	BS-06	0.83	0.63	1.0	27.17	0.07	0.35	0.13	0.097	2.22	138.68	1.000
BS-07 DS	BS-07	0.83	0.81	1.0	29.31	0.08	0.40	0.15	0.082	2.25	138.06	1.000
BS-09 DS	BS-09	0.83	1.35	1.0	34.21	0.10	0.52	0.22	0.060	2.31	137.02	1.000
BS-08 DS	BS-08	0.83	0.83	1.0	29.53	0.08	0.40	0.16	0.081	2.25	138.26	1.000
BS-10 DS	BS-10	0.83	0.88	1.0	30.05	0.09	0.42	0.16	0.078	2.26	137.12	1.000
BS-01 DS	BS-01	0.83	0.86	1.0	29.83	0.08	0.41	0.16	0.079	2.26	139.57	1.000
BS-02 DS	BS-02	0.83	0.00	1.0	0.00	(N/A)	0.00	0.00	2.000	2.00	141.30	1.000
BS-12 DS	BS-12	0.83	0.66	1.0	27.55	0.07	0.36	0.14	0.094	2.23	136.13	1.000
BS-11 DS	BS-11	0.83	1.00	1.0	31.16	0.09	0.44	0.18	0.072	2.27	135.95	1.000

Upstream Structure Headloss (ft)	Upstream Structure Energy Grade Line (In) (ft)	Upstream Structure Hydraulic Grade Line (In) (ft)	Elevation Crown (Start) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Elevation Ground (Start) (ft)
0.00	139.58	139.42	139.84	139.42	137.17	141.01
0.00	139.70	139.66	140.40	139.66	137.60	141.57
0.00	139.15	139.03	139.52	139.03	136.81	140.69
0.00	138.68	138.55	139.03	138.55	136.33	140.20
0.00	138.06	137.91	138.34	137.91	135.66	139.51
0.00	137.02	136.80	137.11	136.80	134.49	138.28
0.00	138.26	138.10	138.53	138.10	135.85	139.70
0.00	137.12	136.96	137.37	136.96	134.70	138.54
0.00	139.57	139.41	139.83	139.41	137.16	141.00
0.00	141.30	141.30	142.13	141.30	139.30	143.30
0.00	136.13	136.00	136.47	136.00	133.77	137.64
0.00	135.95	135.77	136.16	135.77	133.50	137.33

FlexTable: Catchment Table

ID	Label	Outflow Element	Area (User Defined) (acres)	Runoff Coefficient (Rational)	Time of Concentration (Composite) (hours)	Flow (Total Out) (cfs)	Notes
213	BS-15 DA	BS-15	0.092	0.950	0.083	0.65	
214	BS-16 DA	BS-16	0.066	0.950	0.083	0.47	
215	BS-17 DA	BS-17	0.094	0.950	0.083	0.66	
216	BS-27 DA	BS-27	0.018	0.950	0.083	0.13	
228	BS-18 DA	BS-18	0.062	0.095	0.083	0.04	
229	BS-20 DA	BS-20	0.046	0.095	0.083	0.03	
230	BS-22 DA	BS-22	0.069	0.095	0.083	0.05	
231	BS-23 DA	BS-23	0.097	0.095	0.083	0.07	
232	BS-21 DA	BS-21	0.061	0.095	0.083	0.04	
233	BS-19 DA	BS-19	0.086	0.095	0.083	0.06	
234	BS-28 DA	BS-28	0.016	0.095	0.083	0.01	
235	BS-29 DA	BS-29	0.011	0.095	0.083	0.01	
236	BS-30 DA	BS-30	0.019	0.095	0.083	0.01	
273	BS-13 DA	BS-13	0.105	0.950	0.083	0.74	
274	BS-26 DA	BS-26	0.033	0.950	0.083	0.23	
275	BS-14 DA	BS-14	0.049	0.950	0.083	0.35	
285	BS-24 DA	BS-24	0.096	0.950	0.083	0.68	
286	BS-25 DA	BS-25	0.137	0.950	0.083	0.97	
287	BS-31 DA	BS-31	0.031	0.950	0.083	0.22	

FlexTable: Catch Basin Table

ID	Label	Elevation (Ground) (ft)	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Length (ft)	Width (ft)	Inlet Type	Inlet	Manning's n (Inlet)	Capture Efficiency (Calculated) (%)	Longitudinal Slope (Inlet) (ft/ft)
194	BS-15	137.90	137.90	135.90	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.011
197	BS-16	138.80	138.80	136.80	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.006
198	BS-17	139.00	139.00	137.00	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.003
199	BS-27	139.00	139.00	137.00	2.00	5.50	Catalog Inlet	Scupper-Sidewalk	0.015	71.6	0.003
219	BS-18	139.56	139.56	137.56	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.002
220	BS-20	139.69	139.69	137.69	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.002
221	BS-22	139.08	139.08	137.08	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.005
222	BS-19	139.31	139.31	137.31	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.002
223	BS-21	139.45	139.45	137.45	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.002
224	BS-23	138.87	138.87	136.87	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.005
225	BS-28	139.34	139.34	137.34	1.00	2.00	Catalog Inlet	Scupper-Sidewalk	0.015	99.4	0.002
226	BS-29	139.45	139.45	137.45	1.00	2.00	Catalog Inlet	Scupper-Sidewalk	0.015	99.9	0.002
227	BS-30	138.83	138.83	136.83	1.00	2.00	Catalog Inlet	Scupper-Sidewalk	0.015	99.8	0.005
261	BS-13	136.50	136.50	134.50	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.015
262	BS-14	137.80	137.80	135.80	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.015
263	BS-26	137.80	137.80	135.80	2.00	5.50	Catalog Inlet	Scupper-Sidewalk	0.015	70.0	0.015
276	BS-24	137.25	137.25	135.25	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.015
277	BS-25	137.10	137.10	135.10	2.00	5.50	Catalog Inlet	Scupper	0.015	100.0	0.015
278	BS-31	137.10	137.10	135.10	2.00	5.50	Catalog Inlet	Scupper-Sidewalk	0.015	73.7	0.015

Road Cross Slope (ft/ft)	Flow (Captured) (cfs)	Hydraulic Grade Line (In) (ft)	Spread / Top Width (ft)
0.040	0.65	136.25	3.8
0.040	0.47	137.10	3.7
0.040	0.66	137.36	4.9
0.020	0.09	137.14	4.1
0.040	0.04	137.65	1.9
0.040	0.03	137.77	1.8
0.040	0.05	137.17	1.7
0.040	0.06	137.42	2.1
0.040	0.04	137.54	1.9
0.040	0.07	136.98	1.9
0.020	0.01	137.39	1.7
0.020	0.01	137.49	1.6
0.020	0.01	136.88	1.6
0.040	0.74	134.88	3.8
0.040	0.35	136.06	2.9

FlexTable: Catch Basin Table

Road Cross Slope (ft/ft)	Flow (Captured) (cfs)	Hydraulic Grade Line (In) (ft)	Spread / Top Width (ft)
0.020	0.19	136.00	4.0
0.040	0.68	135.61	3.7
0.040	0.97	135.54	4.2
0.020	0.16	135.28	3.7

Conduit FlexTable: Combined Pipe/Node Report

Label	Start Node	Stop Node	Upstream Inlet C	System Intensity (in/h)	Upstream Inlet Area (acres)	Upstream Structure Flow (Total Surface) (cfs)	System CA (acres)	System Drainage Area (ft ²)	System Rational Flow (cfs)	Flow (cfs)	Diameter (in)	Length (Unified) (ft)	Velocity (ft/s)	Capacity (Full Flow) (cfs)
BS-15 DS	BS-15	BS-15 OUT	0.950	7.369	0.092	0.65	0.087	4,007.5	0.65	0.65	10.0	1.0	21.50	28.48
BS-17 DS	BS-17	BS-17 OUT	0.950	7.370	0.094	0.66	0.089	4,094.6	0.66	0.66	10.0	1.0	21.64	28.48
BS-27 DS	BS-27	BS-27 OUT	0.950	7.369	0.018	0.13	0.012	784.1	0.09	0.09	8.0	1.0	12.20	15.71
BS-16 DS	BS-16	BS-16 OUT	0.950	7.369	0.066	0.47	0.063	2,875.0	0.47	0.47	10.0	1.0	19.47	28.48
BS-18 DS	BS-18	BS-18 OUT	0.095	7.370	0.062	0.04	0.006	2,700.7	0.04	0.04	10.0	1.0	9.49	28.48
BS-20 DS	BS-20	BS-20 OUT	0.095	7.378	0.046	0.03	0.004	2,003.8	0.03	0.03	10.0	1.0	8.71	28.48
BS-22 DS	BS-22	BS-22 OUT	0.095	7.378	0.069	0.05	0.007	3,005.6	0.05	0.05	10.0	1.0	9.77	28.48
BS-19 DS	BS-19	BS-19 OUT	0.095	7.378	0.086	0.06	0.008	3,746.2	0.06	0.06	10.0	1.0	10.40	28.48
BS-21 DS	BS-21	BS-21 OUT	0.095	7.378	0.061	0.04	0.006	2,657.2	0.04	0.04	10.0	1.0	9.44	28.48
BS-23 DS	BS-23	BS-23 OUT	0.095	7.378	0.097	0.07	0.009	4,225.3	0.07	0.07	10.0	1.0	10.83	28.48
BS-30 DS	BS-30	BS-30 OUT	0.095	7.378	0.019	0.01	0.002	827.6	0.01	0.01	8.0	1.0	6.96	15.71
BS-29 DS	BS-29	BS-29 OUT	0.095	7.378	0.011	0.01	0.001	479.2	0.01	0.01	8.0	1.0	5.85	15.71
BS-28 DS	BS-28	BS-28 OUT	0.095	7.378	0.016	0.01	0.002	697.0	0.01	0.01	8.0	1.0	6.33	15.71
BS-13 DS	BS-13	BS-13 OUT	0.950	7.369	0.105	0.74	0.100	4,573.8	0.74	0.74	10.0	1.0	22.37	28.48
BS-14 DS	BS-14	BS-14 OUT	0.950	7.370	0.049	0.35	0.047	2,134.4	0.35	0.35	10.0	1.0	17.72	28.48
BS-26 DS	BS-26	BS-26 OUT	0.950	7.369	0.033	0.23	0.025	1,437.5	0.19	0.19	8.0	1.0	15.17	15.71
BS-24 DS	BS-24	BS-24 OUT	0.950	7.369	0.096	0.68	0.091	4,181.8	0.68	0.68	10.0	1.0	21.78	28.48
BS-25 DS	BS-25	BS-25 OUT	0.950	7.369	0.137	0.97	0.130	5,967.7	0.97	0.97	10.0	1.0	24.28	28.48
BS-31 DS	BS-31	BS-31 OUT	0.950	7.370	0.031	0.22	0.022	1,350.4	0.16	0.16	8.0	1.0	14.47	15.71

Invert (Start) (ft)	Invert (Stop) (ft)	Slope (Calculated) (ft/ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
135.90	134.90	1.000	136.25	135.06
137.00	136.00	1.000	137.36	136.16
137.00	136.00	1.000	137.14	136.05
136.80	135.80	1.000	137.10	135.93
137.56	136.56	1.000	137.65	136.59
137.69	136.69	1.000	137.77	136.71
137.08	136.08	1.000	137.17	136.11
137.31	136.31	1.000	137.42	136.35
137.45	136.45	1.000	137.54	136.48
136.87	135.87	1.000	136.98	135.91
136.83	135.83	1.000	136.88	135.85
137.45	136.45	1.000	137.49	136.46
137.34	136.34	1.000	137.39	136.35
134.50	133.50	1.000	134.88	133.67

Conduit FlexTable: Combined Pipe/Node Report

Invert (Start) (ft)	Invert (Stop) (ft)	Slope (Calculated) (ft/ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
135.80	134.80	1.000	136.06	134.90
135.80	134.80	1.000	136.00	134.88
135.25	134.25	1.000	135.61	134.41
135.10	134.10	1.000	135.54	134.30
135.10	134.10	1.000	135.28	134.17

Conduit FlexTable: DOT Report

Label	-Node- Upstream Downstream	-Depth- Upstream Downstream (ft)	-EGL- Upstream Downstream (ft)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	-Invert- Upstream Downstream (ft)	Section Discharge Capacity (cfs)	-X- Upstream Downstream (ft)	-Y- Upstream Downstream (ft)
BS-15 DS	BS-15	0.35	136.39	137.90	136.25	135.90	0.65	-154.11	-63.48
	BS-15 OUT	(N/A)	(N/A)	0.00	135.06	0.00	28.48	-154.23	-71.58
BS-17 DS	BS-17	0.36	137.49	139.00	137.36	137.00	0.66	-116.36	-99.59
	BS-17 OUT	(N/A)	(N/A)	0.00	136.16	0.00	28.48	-116.42	-93.08
BS-27 DS	BS-27	0.14	137.19	139.00	137.14	137.00	0.09	-116.36	-109.21
	BS-27 OUT	(N/A)	(N/A)	0.00	136.05	0.00	15.71	-116.13	-115.74
BS-16 DS	BS-16	0.30	137.21	138.80	137.10	136.80	0.47	-116.69	-63.10
	BS-16 OUT	(N/A)	(N/A)	0.00	135.93	0.00	28.48	-116.49	-69.51
BS-18 DS	BS-18	0.09	137.68	139.56	137.65	137.56	0.04	-61.53	-61.21
	BS-18 OUT	(N/A)	(N/A)	0.00	136.59	0.00	28.48	-61.50	-67.60
BS-20 DS	BS-20	0.08	137.79	139.69	137.77	137.69	0.03	-17.55	-60.70
	BS-20 OUT	(N/A)	(N/A)	0.00	136.71	0.00	28.48	-17.34	-67.77
BS-22 DS	BS-22	0.09	137.21	139.08	137.17	137.08	0.05	14.55	-60.02
	BS-22 OUT	(N/A)	(N/A)	0.00	136.11	0.00	28.48	14.93	-66.24
BS-19 DS	BS-19	0.11	137.45	139.31	137.42	137.31	0.06	-62.21	-102.31
	BS-19 OUT	(N/A)	(N/A)	0.00	136.35	0.00	28.48	-62.85	-92.56
BS-21 DS	BS-21	0.09	137.57	139.45	137.54	137.45	0.04	-17.55	-99.59
	BS-21 OUT	(N/A)	(N/A)	0.00	136.48	0.00	28.48	-17.51	-89.85
BS-23 DS	BS-23	0.11	137.02	138.87	136.98	136.87	0.07	15.40	-100.27
	BS-23 OUT	(N/A)	(N/A)	0.00	135.91	0.00	28.48	15.10	-90.35
BS-30 DS	BS-30	0.05	136.90	138.83	136.88	136.83	0.01	14.55	-111.99
	BS-30 OUT	(N/A)	(N/A)	0.00	135.85	0.00	15.71	15.61	-123.13
BS-29 DS	BS-29	0.04	137.50	139.45	137.49	137.45	0.01	-16.36	-111.99
	BS-29 OUT	(N/A)	(N/A)	0.00	136.46	0.00	15.71	-16.15	-123.47
BS-28 DS	BS-28	0.05	137.40	139.34	137.39	137.34	0.01	-62.72	-112.50
	BS-28 OUT	(N/A)	(N/A)	0.00	136.35	0.00	15.71	-61.33	-123.13
BS-13 DS	BS-13	0.38	135.03	136.50	134.88	134.50	0.74	-193.02	-63.10
	BS-13 OUT	(N/A)	(N/A)	0.00	133.67	0.00	28.48	-193.05	-69.24
BS-14 DS	BS-14	0.26	136.15	137.80	136.06	135.80	0.35	-194.07	-98.35
	BS-14 OUT	(N/A)	(N/A)	0.00	134.90	0.00	28.48	-194.20	-91.62
BS-26 DS	BS-26	0.20	136.07	137.80	136.00	135.80	0.19	-194.07	-107.44
	BS-26 OUT	(N/A)	(N/A)	0.00	134.88	0.00	15.71	-194.13	-113.80
BS-24 DS	BS-24	0.36	135.75	137.25	135.61	135.25	0.68	66.68	-58.99
	BS-24 OUT	(N/A)	(N/A)	0.00	134.41	0.00	28.48	66.68	-67.91
BS-25 DS	BS-25	0.44	135.71	137.10	135.54	135.10	0.97	67.46	-99.91
	BS-25 OUT	(N/A)	(N/A)	0.00	134.30	0.00	28.48	67.38	-91.18
BS-31 DS	BS-31	0.18	135.35	137.10	135.28	135.10	0.16	67.07	-114.07
	BS-31 OUT	(N/A)	(N/A)	0.00	134.17	0.00	15.71	67.46	-122.02

Conduit FlexTable: HEC-22 Table A

Label	Upstream Structure	Rise (Unified) (ft)	Flow (cfs)	Length (Unified) (ft)	Velocity (ft/s)	Depth (Normal) (ft)	Depth (Critical) (ft)	Upstream Structure Velocity Head (In-Governing) (ft)	Friction Slope (ft/ft)	Headloss (ft)	Energy Grade Line (In) (ft)	Upstream Structure Headloss Coefficient
BS-15 DS	BS-15	0.83	0.65	1.0	21.50	0.09	0.35	0.13	0.045	1.20	136.39	1.000
BS-17 DS	BS-17	0.83	0.66	1.0	21.64	0.09	0.36	0.14	0.044	1.20	137.49	1.000
BS-27 DS	BS-27	0.67	0.09	1.0	12.20	0.04	0.14	0.05	0.146	1.09	137.19	1.000
BS-16 DS	BS-16	0.83	0.47	1.0	19.47	0.07	0.30	0.11	0.055	1.17	137.21	1.000
BS-18 DS	BS-18	0.83	0.04	1.0	9.49	0.02	0.09	0.03	0.245	1.06	137.68	1.000
BS-20 DS	BS-20	0.83	0.03	1.0	8.71	0.02	0.08	0.03	0.291	1.05	137.79	1.000
BS-22 DS	BS-22	0.83	0.05	1.0	9.77	0.03	0.09	0.03	0.230	1.06	137.21	1.000
BS-19 DS	BS-19	0.83	0.06	1.0	10.40	0.03	0.11	0.04	0.201	1.07	137.45	1.000
BS-21 DS	BS-21	0.83	0.04	1.0	9.44	0.02	0.09	0.03	0.248	1.06	137.57	1.000
BS-23 DS	BS-23	0.83	0.07	1.0	10.83	0.03	0.11	0.04	0.186	1.07	137.02	1.000
BS-30 DS	BS-30	0.67	0.01	1.0	6.96	0.01	0.05	0.02	0.430	1.04	136.90	1.000
BS-29 DS	BS-29	0.67	0.01	1.0	5.85	0.01	0.04	0.01	0.532	1.03	137.50	1.000
BS-28 DS	BS-28	0.67	0.01	1.0	6.33	0.01	0.05	0.02	0.462	1.03	137.40	1.000
BS-13 DS	BS-13	0.83	0.74	1.0	22.37	0.09	0.38	0.15	0.042	1.21	135.03	1.000
BS-14 DS	BS-14	0.83	0.35	1.0	17.72	0.06	0.26	0.09	0.066	1.15	136.15	1.000
BS-26 DS	BS-26	0.67	0.19	1.0	15.17	0.05	0.20	0.07	0.091	1.12	136.07	1.000
BS-24 DS	BS-24	0.83	0.68	1.0	21.78	0.09	0.36	0.14	0.044	1.20	135.75	1.000
BS-25 DS	BS-25	0.83	0.97	1.0	24.28	0.11	0.44	0.17	0.036	1.23	135.71	1.000
BS-31 DS	BS-31	0.67	0.16	1.0	14.47	0.05	0.18	0.07	0.101	1.11	135.35	1.000

Upstream Structure Headloss (ft)	Upstream Structure Energy Grade Line (In) (ft)	Upstream Structure Hydraulic Grade Line (In) (ft)	Elevation Crown (Start) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Elevation Ground (Start) (ft)
0.00	136.39	136.25	136.73	136.25	135.06	137.90
0.00	137.49	137.36	137.83	137.36	136.16	139.00
0.00	137.19	137.14	137.67	137.14	136.05	139.00
0.00	137.21	137.10	137.63	137.10	135.93	138.80
0.00	137.68	137.65	138.39	137.65	136.59	139.56
0.00	137.79	137.77	138.52	137.77	136.71	139.69
0.00	137.21	137.17	137.91	137.17	136.11	139.08
0.00	137.45	137.42	138.14	137.42	136.35	139.31
0.00	137.57	137.54	138.28	137.54	136.48	139.45
0.00	137.02	136.98	137.70	136.98	135.91	138.87
0.00	136.90	136.88	137.50	136.88	135.85	138.83
0.00	137.50	137.49	138.12	137.49	136.46	139.45

Conduit FlexTable: HEC-22 Table A

Upstream Structure Headloss (ft)	Upstream Structure Energy Grade Line (In) (ft)	Upstream Structure Hydraulic Grade Line (In) (ft)	Elevation Crown (Start) (ft)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Elevation Ground (Start) (ft)
0.00	137.40	137.39	138.01	137.39	136.35	139.34
0.00	135.03	134.88	135.33	134.88	133.67	136.50
0.00	136.15	136.06	136.63	136.06	134.90	137.80
0.00	136.07	136.00	136.47	136.00	134.88	137.80
0.00	135.75	135.61	136.08	135.61	134.41	137.25
0.00	135.71	135.54	135.93	135.54	134.30	137.10
0.00	135.35	135.28	135.77	135.28	134.17	137.10

OUTLET PROTECTION DESIGN

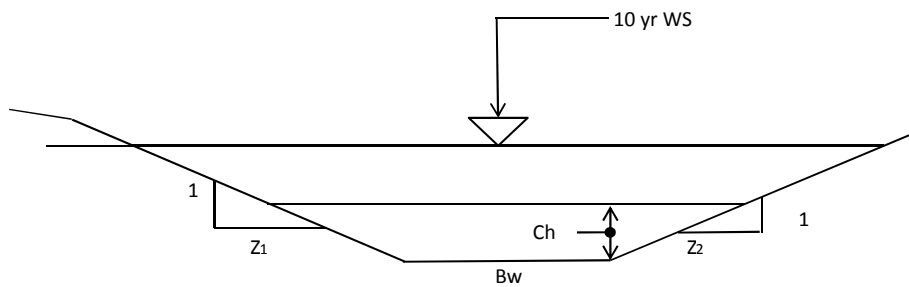
Outfall	Roadway Station	Offset	Construct riprap swale downstream of outfall?	10 Year Recurrence							Riprap Apron											Preformed Scour Hole																	
				Discharge, Q	Outlet Velocity, V	Pipe Diameter, R _p (= S _p)	Invert Elevation (NAVD)	HGL Elevation	Tailwater Elevation (NAVD)	Tailwater Depth, TW	Preferred selection: riprap apron or preformed scour hole?	Constructed Type of Outlet Protection	TW / R _p	Apron Type	Minimum Apron Length, (L _a) _{min}	Maximum Apron Length, (L _a) _{max}	Computed Apron Length, (L _a) _{computed}	Length of Apron, L _a	U/S Width of Apron, W ₁	D/S Width of Apron, W ₂	Riprap Type	Riprap Depth, d (in)	Apron Width Sideslope, (X:1)	Type 1: F = 0.5 R _p			Type 2: F = R _p			Design									
																								Median Stone Size, d ₅₀	Basin Length, C	Basin Width, B	Median Stone Size, d ₅₀	Basin Length, C	Basin Width, B	Selected Type	Median Stone Size, d ₅₀	Riprap Type	Basin Depression, F	Basin Length, C	Basin Width, B	Pipe Diameter, S _p (in)	Riprap Depth, d (in)		
																																						Basin Length, C	Basin Width, B
1	WB 179+61	L 40.0	No	1.52	6.84	15.000	128.75	129.05	129.05	0.30	Riprap Apron	Riprap Apron	0.2	Type A	10.0	14.0	9.89	10.00	3.75	10.75	Modified	12	3:1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
2	EB 179+60	L 53.0	No	0.43	7.35	15.000	131.00	131.12	131.12	0.12	Riprap Apron	Riprap Apron	0.1	Type A	10.0	14.0	9.86	10.00	3.75	10.75	Modified	12	3:1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	EB 182+10	L 51.5	Yes	0.98	10.09	15.000	114.00	114.17	114.17	0.17	n/a	Riprap Swale	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
4	WB 184+31	R 45.5	No	0.81	7.00	15.000	132.00	132.19	132.19	0.19	Riprap Apron	Riprap Apron	0.2	Type A	10.0	14.0	9.87	10.00	3.75	10.75	Modified	12	3:1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5	EB 190+63	L 44.0	No	1.21	6.70	15.000	131.10	131.38	131.38	0.28	Riprap Apron	Riprap Apron	0.2	Type A	10.0	14.0	9.88	10.00	3.75	10.75	Modified	12	3:1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
6	WB 186+00	R 40.0	No	1.48	8.74	15.000	131.25	131.50	131.50	0.25	Riprap Apron	Riprap Apron	0.2	Type A	10.0	14.0	9.89	10.00	3.75	10.75	Intermediate	18	3:1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
7	EB 192+30	L 100.0	No	10.64	15.62	24.000	113.00	113.54	113.54	0.54	Preformed Scour Hole	Preformed Scour Hole	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a		

WATER QUALITY SWALE 1

Total drainage area = Sum of the Outfalls + Sheet Flow		
	Area (ft ²)	Area (Acres)
Outfalls 1 and 2	15942	0.37
Pervious	17950	0.41
Total Area	33892	0.78

Begin Station	End Station	Total Watershed Area [acres]	Impervious Watershed Area [acres]	Precipitation	For Slope (Z ₁)	Back Slope (Z ₂)	Check Dam Height (Ch)	Bottom Width (Bw)	Swale Slope
179+65	181+20	0.78	0.37	1.00	3	3	1.5	8	0.65

Impervious Cover "I" [%]	Volumetric Runoff Coefficient R _v = 0.05 + 0.9 (I)	Water Quality Volume WQ _v [ft ³]	Length of Swale	Total Rise	Cross Sectional Area	Volume Retained/Check Dam	Minimum # Check Dams Required	Maximum Check Dam Spacing	Water Quality Volume Achieved
47%	0.47	49.52	155	1.01	18.75	80	1	155	80.1





NOAA Atlas 14, Volume 10, Version 3
Location name: Southbury, Connecticut, USA*
Latitude: 41.4394°, Longitude: -73.2477°
Elevation: 99.98 ft**



* source: ESRI Maps
 ** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

[PF_tabular](#) | [PF_graphical](#) | [Maps & aerials](#)

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)¹										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	4.34 (3.31-5.63)	5.10 (3.89-6.61)	6.34 (4.81-8.24)	7.37 (5.57-9.61)	8.78 (6.44-11.9)	9.85 (7.09-13.5)	11.0 (7.68-15.5)	12.2 (8.15-17.5)	13.9 (8.98-20.6)	15.3 (9.66-23.0)
10-min	3.08 (2.35-3.98)	3.61 (2.75-4.69)	4.49 (3.40-5.83)	5.22 (3.94-6.81)	6.22 (4.57-8.40)	6.98 (5.03-9.59)	7.76 (5.44-11.0)	8.63 (5.78-12.4)	9.84 (6.37-14.6)	10.8 (6.85-16.3)
15-min	2.42 (1.84-3.12)	2.84 (2.16-3.67)	3.52 (2.67-4.58)	4.10 (3.10-5.35)	4.88 (3.58-6.59)	5.47 (3.94-7.52)	6.09 (4.27-8.61)	6.76 (4.53-9.75)	7.72 (4.99-11.4)	8.48 (5.37-12.8)
30-min	1.67 (1.27-2.16)	1.96 (1.49-2.54)	2.43 (1.84-3.15)	2.82 (2.13-3.67)	3.35 (2.46-4.52)	3.76 (2.70-5.15)	4.18 (2.92-5.89)	4.63 (3.10-6.67)	5.25 (3.39-7.78)	5.74 (3.63-8.65)
60-min	1.07 (0.813-1.38)	1.25 (0.950-1.62)	1.55 (1.17-2.01)	1.79 (1.35-2.34)	2.13 (1.56-2.87)	2.39 (1.72-3.28)	2.66 (1.85-3.74)	2.94 (1.97-4.23)	3.32 (2.15-4.92)	3.62 (2.29-5.45)
2-hr	0.697 (0.535-0.896)	0.814 (0.624-1.05)	1.01 (0.769-1.30)	1.17 (0.886-1.51)	1.39 (1.02-1.86)	1.55 (1.12-2.12)	1.72 (1.22-2.43)	1.92 (1.29-2.75)	2.20 (1.43-3.24)	2.42 (1.54-3.63)
3-hr	0.536 (0.413-0.687)	0.629 (0.484-0.807)	0.780 (0.598-1.00)	0.905 (0.691-1.17)	1.08 (0.800-1.44)	1.21 (0.880-1.65)	1.34 (0.955-1.89)	1.50 (1.01-2.15)	1.74 (1.13-2.55)	1.93 (1.23-2.88)
6-hr	0.337 (0.262-0.429)	0.400 (0.310-0.510)	0.504 (0.389-0.644)	0.590 (0.453-0.757)	0.709 (0.530-0.945)	0.797 (0.585-1.08)	0.891 (0.639-1.25)	1.00 (0.679-1.42)	1.17 (0.765-1.71)	1.32 (0.840-1.95)
12-hr	0.204 (0.159-0.258)	0.247 (0.193-0.313)	0.318 (0.248-0.404)	0.377 (0.292-0.480)	0.458 (0.344-0.607)	0.518 (0.383-0.700)	0.582 (0.420-0.816)	0.660 (0.448-0.931)	0.778 (0.509-1.13)	0.879 (0.563-1.30)
24-hr	0.120 (0.094-0.151)	0.148 (0.116-0.186)	0.194 (0.152-0.245)	0.233 (0.181-0.294)	0.285 (0.216-0.377)	0.324 (0.241-0.437)	0.366 (0.267-0.513)	0.419 (0.285-0.586)	0.499 (0.327-0.719)	0.568 (0.365-0.831)
2-day	0.068 (0.054-0.085)	0.085 (0.067-0.106)	0.113 (0.089-0.142)	0.136 (0.107-0.171)	0.168 (0.128-0.221)	0.191 (0.144-0.257)	0.217 (0.160-0.304)	0.250 (0.171-0.348)	0.301 (0.198-0.432)	0.347 (0.223-0.504)
3-day	0.050 (0.039-0.062)	0.062 (0.049-0.077)	0.082 (0.065-0.103)	0.099 (0.078-0.124)	0.122 (0.094-0.160)	0.139 (0.105-0.187)	0.158 (0.117-0.220)	0.182 (0.125-0.252)	0.220 (0.145-0.314)	0.254 (0.164-0.367)
4-day	0.040 (0.032-0.050)	0.050 (0.040-0.062)	0.066 (0.052-0.082)	0.079 (0.063-0.099)	0.098 (0.075-0.128)	0.111 (0.084-0.148)	0.126 (0.093-0.175)	0.145 (0.100-0.201)	0.175 (0.116-0.249)	0.202 (0.130-0.291)
7-day	0.027 (0.022-0.034)	0.033 (0.027-0.041)	0.044 (0.035-0.054)	0.052 (0.041-0.065)	0.064 (0.049-0.083)	0.072 (0.055-0.096)	0.082 (0.060-0.112)	0.093 (0.064-0.128)	0.111 (0.074-0.157)	0.127 (0.082-0.182)
10-day	0.022 (0.018-0.027)	0.027 (0.022-0.033)	0.034 (0.027-0.042)	0.041 (0.032-0.050)	0.049 (0.038-0.063)	0.055 (0.042-0.073)	0.062 (0.046-0.085)	0.071 (0.049-0.097)	0.083 (0.055-0.117)	0.094 (0.061-0.134)
20-day	0.016 (0.013-0.019)	0.018 (0.015-0.022)	0.022 (0.018-0.027)	0.026 (0.021-0.032)	0.030 (0.024-0.039)	0.034 (0.026-0.044)	0.038 (0.028-0.050)	0.042 (0.029-0.056)	0.047 (0.032-0.066)	0.052 (0.034-0.074)
30-day	0.013 (0.011-0.016)	0.015 (0.012-0.018)	0.018 (0.014-0.022)	0.020 (0.016-0.025)	0.023 (0.018-0.029)	0.026 (0.020-0.033)	0.028 (0.021-0.037)	0.031 (0.022-0.042)	0.034 (0.023-0.048)	0.037 (0.024-0.053)
45-day	0.011 (0.009-0.013)	0.012 (0.010-0.015)	0.014 (0.012-0.017)	0.016 (0.013-0.019)	0.018 (0.014-0.023)	0.020 (0.015-0.025)	0.021 (0.016-0.028)	0.023 (0.016-0.031)	0.025 (0.017-0.035)	0.027 (0.018-0.038)
60-day	0.010 (0.008-0.012)	0.010 (0.009-0.013)	0.012 (0.010-0.015)	0.013 (0.011-0.016)	0.015 (0.012-0.019)	0.016 (0.013-0.021)	0.018 (0.013-0.023)	0.019 (0.013-0.026)	0.021 (0.014-0.029)	0.022 (0.014-0.031)

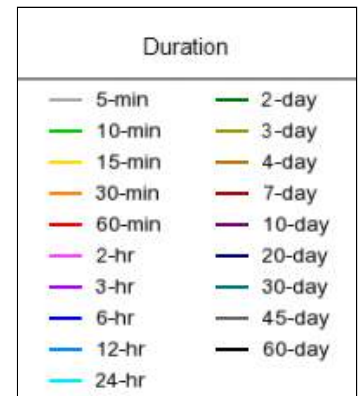
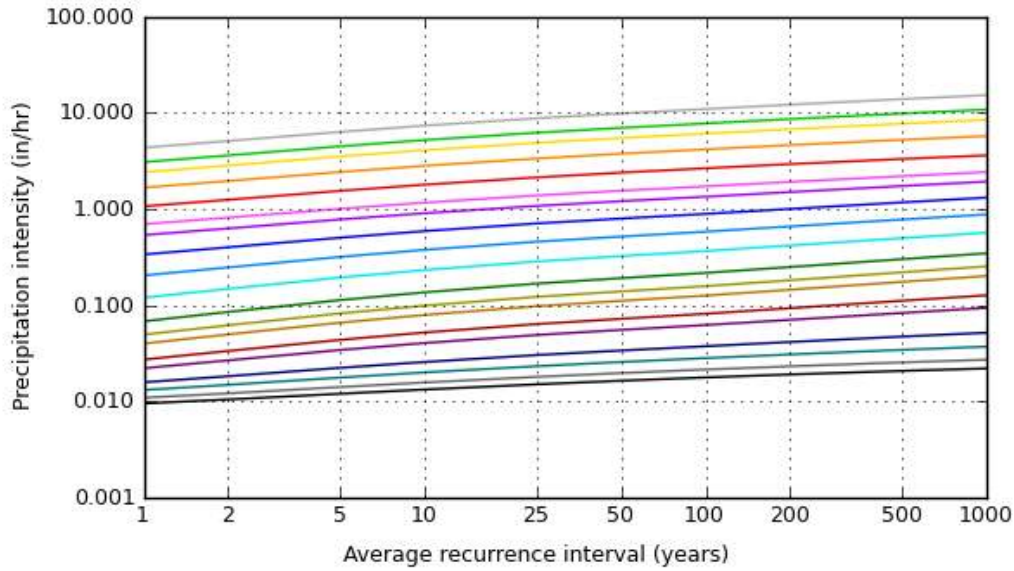
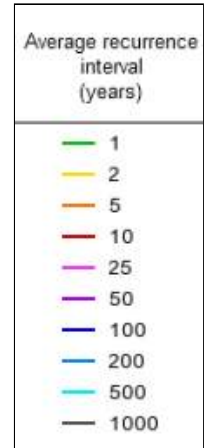
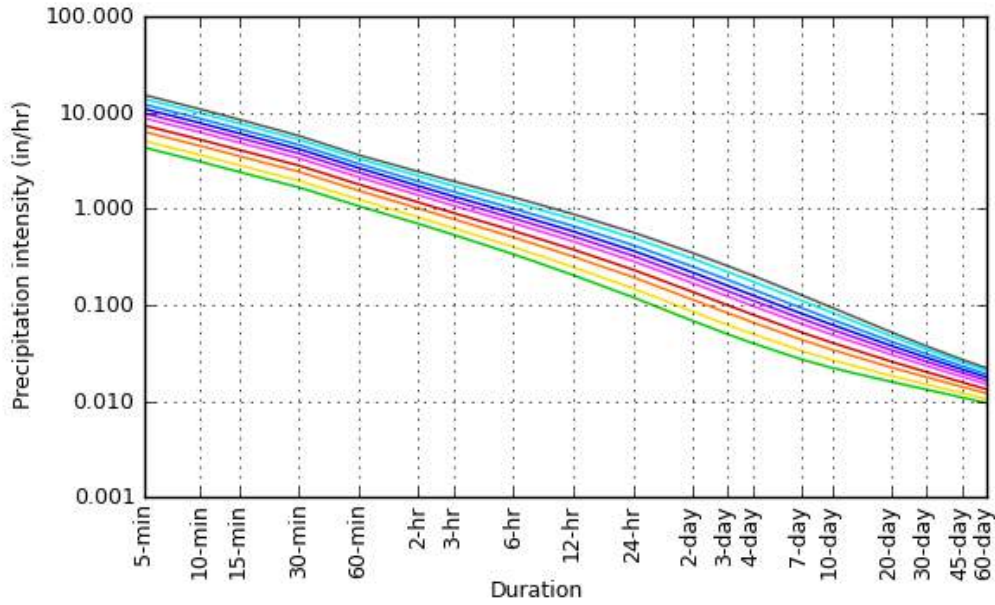
¹ Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS). Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values. Please refer to NOAA Atlas 14 document for more information.

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PF graphical

PDS-based intensity-duration-frequency (IDF) curves

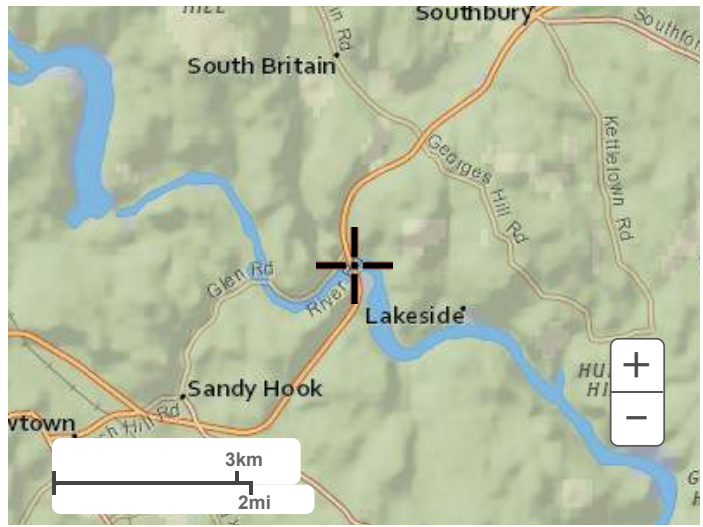
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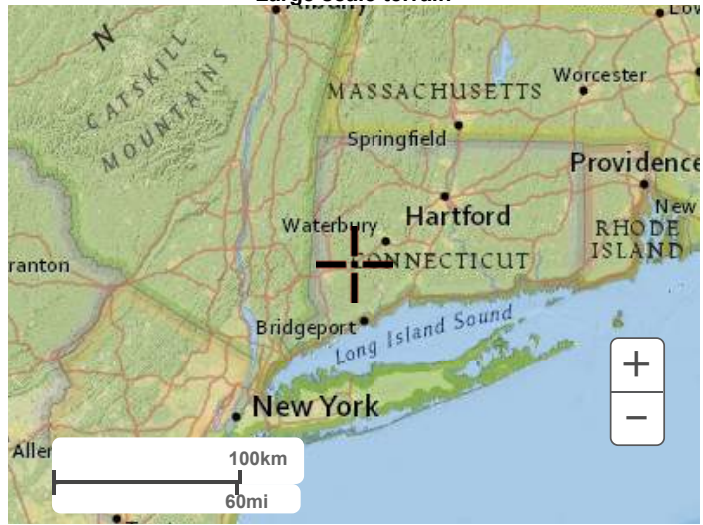
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Maps & aerials

Small scale terrain



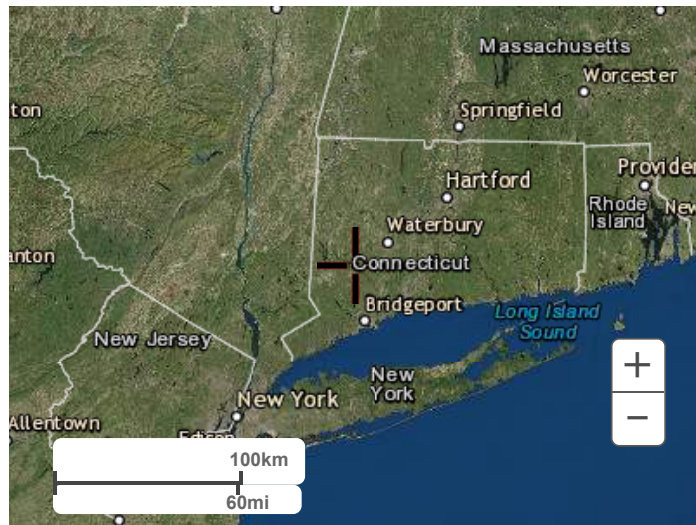
Large scale terrain



Large scale map



Large scale aerial



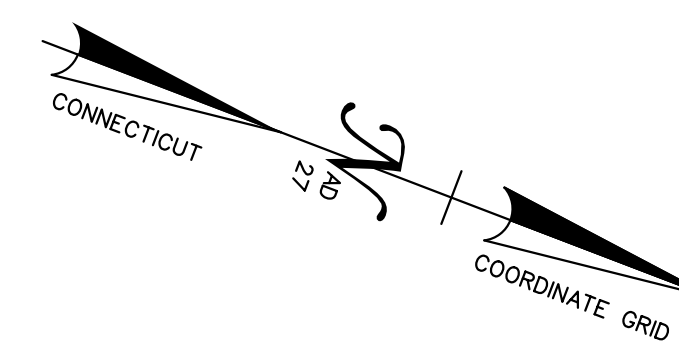
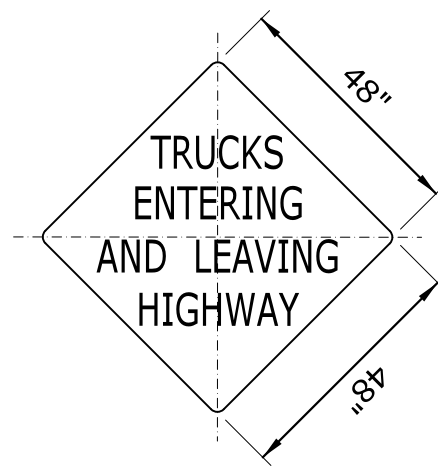
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[US Department of Commerce](#)
[National Oceanic and Atmospheric Administration](#)
[National Weather Service](#)
[National Water Center](#)
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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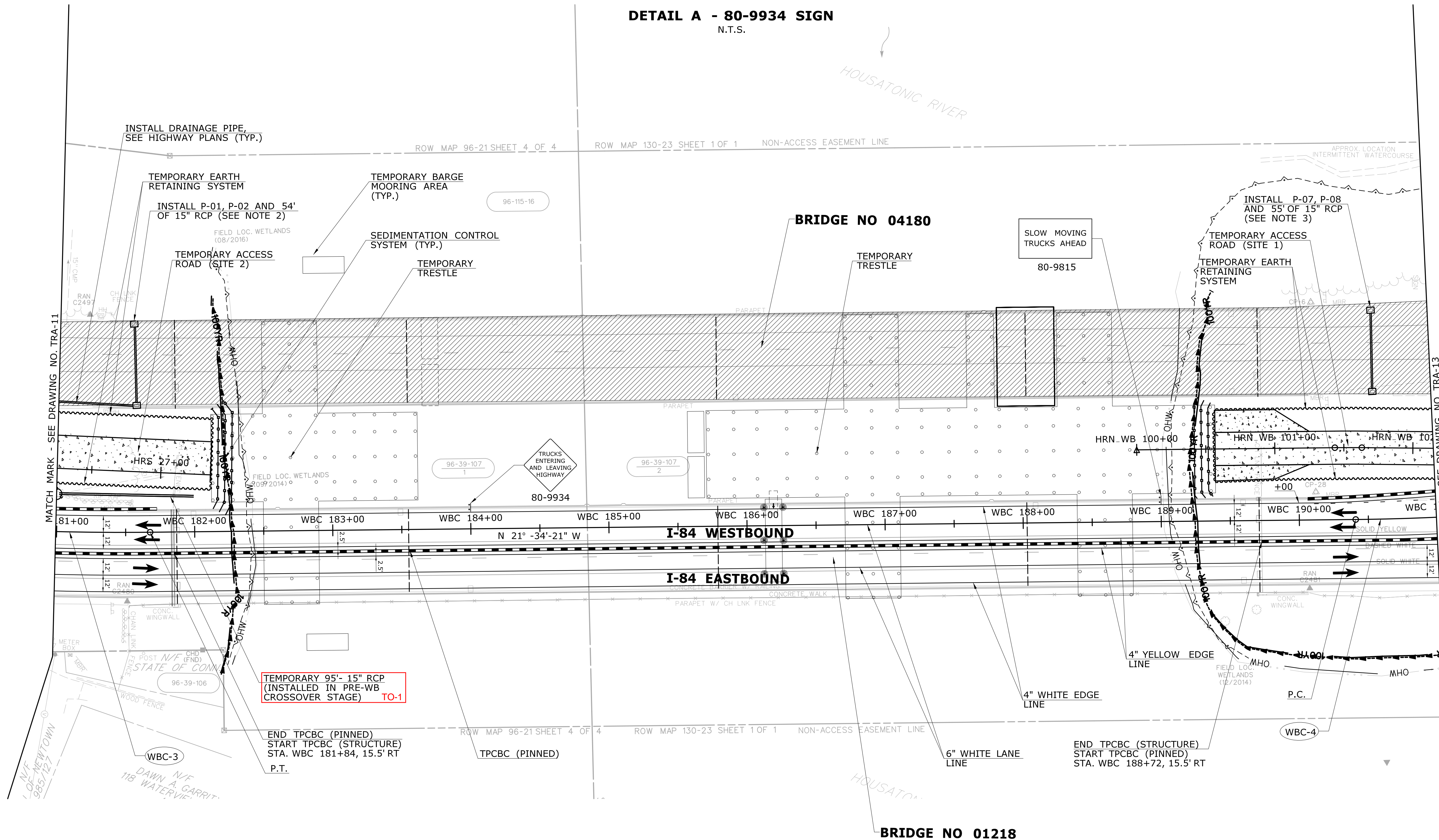
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I-84 WESTBOUND	
STA.	172+97.934
P.C.	N 219853.502
E	463723.227
C.C.	N 219999.769
E	461805.572
STA.	181+67.710
P.T.	N 220706.201
E	463594.357
Δ	25° 54'43.0" LEFT
T	442.45'
L	869.776'
R	1923.22'

CURVE NO. WBC-4	
I-84 WESTBOUND	
STA.	190+40.830
P.C.	N 221518.286
E	463273.646
C.C.	N 220906.705
E	461725.035
STA.	193+19.563
P.T.	N 221767.775
E	463150.091
Δ	9° 35'30.15" LEFT
T	139.69'
L	278.73'
R	1665'



- NOTES:
- SEE DRAWING NO. TRA-02 FOR NOTES AND LEGEND.
 - COVER P-01 AND P-02 WITH STEEL PLATES, REMOVE PLATES, INSTALL TOP DURING STAGE 4.
 - COVER P-07 AND P-08 WITH STEEL PLATES, REMOVE PLATES, INSTALL TOP, OUTFALL PIPE AND OUTFALL 4 DURING STAGE 4, SEE HIGHWAY PLANS.

DETAIL A - 80-9934 SIGN
N.T.S.



REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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

DESIGNER/DRAFTER:
J. HUND
CHECKED BY:
S. SUEHR
SCALE IN FEET
0 40 80
SCALE 1"=40'

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

SIGNATURE/BLOCK:

LOUIS BERGER US
A WSP COMPANY
55 CAPITAL BOULEVARD
ROCKY HILL, CT 06067

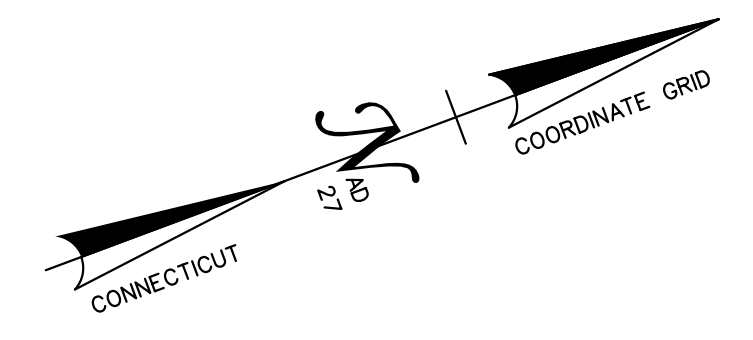
PROJECT TITLE:
REHABILITATION OF BRIDGE NOS 01218 & 04180 - I-84 EB/WB OVER HOUSATONIC RIVER

TOWN:
NEWTOWN/SOUTHURY
DRAWING TITLE:
I-84 STAGE 2 WB CROSSOVER

PROJECT NO.
96-201
DRAWING NO.
TRA-12
SHEET NO.
05.12

Plotted Date: 9/11/2019

Filename: ...VHW_MSH_0096_0201_WB_STG-03.dgn

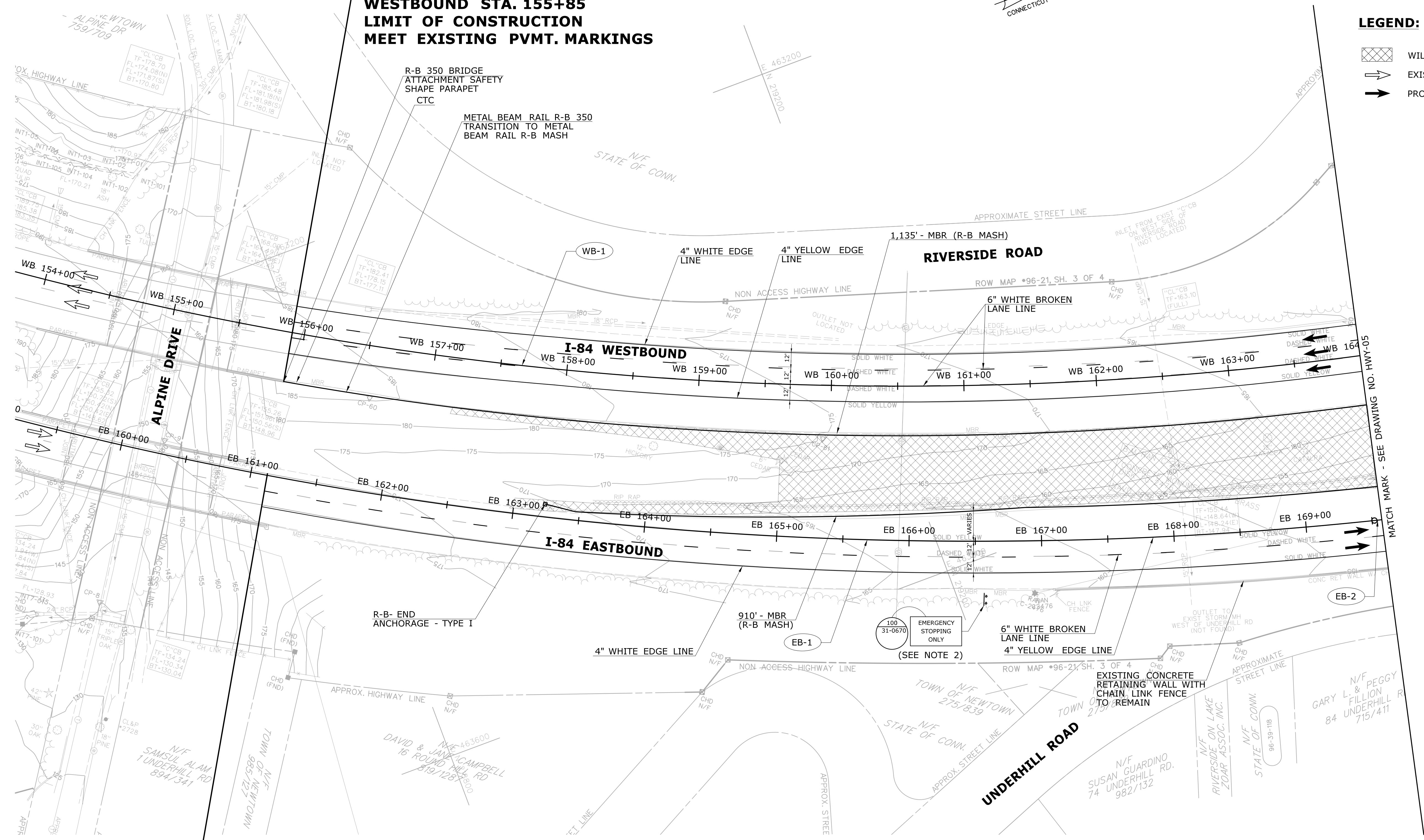


- NOTES:
- FOR CURVE DATA, SEE DRAWING HWY-03.
 - REMOVE EXISTING SIGN. WORK TO BE PAID FOR UNDER "REMOVAL AND RELOCATION OF EXISTING SIGNS".

- LEGEND:
- WILDFLOWER ESTABLISHMENT
 - EXISTING DIRECTION OF TRAFFIC
 - PROPOSED DIRECTION OF TRAFFIC

**BEGIN PROJECT NO. 96-201
WESTBOUND STA. 155+85
LIMIT OF CONSTRUCTION
MEET EXISTING PVMT. MARKINGS**

**BEGIN PROJECT NO. 96-201
LIMIT OF CONSTRUCTION
STA. EB 161+12
MEET EXISTING PVMT. MARKINGS**



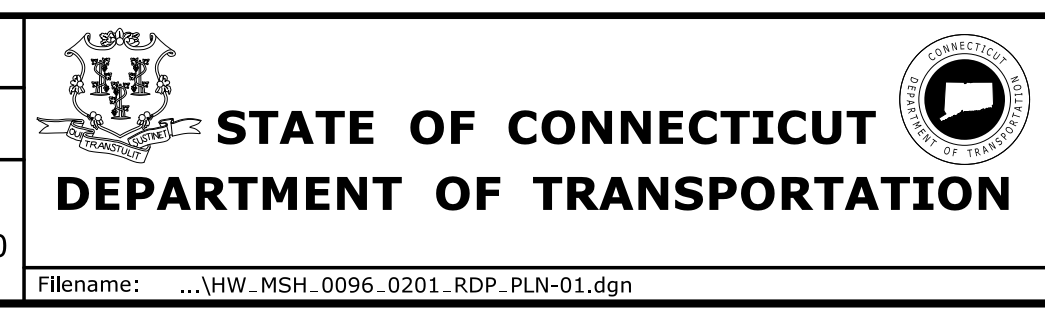
REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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

DESIGNER/DRAFTER:
J. HUND

CHECKED BY:
S. SUEHR

SCALE IN FEET
0 40 80
SCALE 1"=40'



SIGNATURE/BLOCK:

LOUIS BERGER US
A WSP COMPANY
55 CAPITAL BOULEVARD
ROCKY HILL, CT 06067

PROJECT TITLE:
**REHABILITATION OF BRIDGE NOS
01218 & 04180 - I-84 EB/WB
OVER HOUSATONIC RIVER**

TOWN:
NEWTOWN/SOUTHBURY

DRAWING TITLE:
HIGHWAY PLAN

PROJECT NO.
96-201

DRAWING NO.
HWY-04

SHEET NO.
03.04

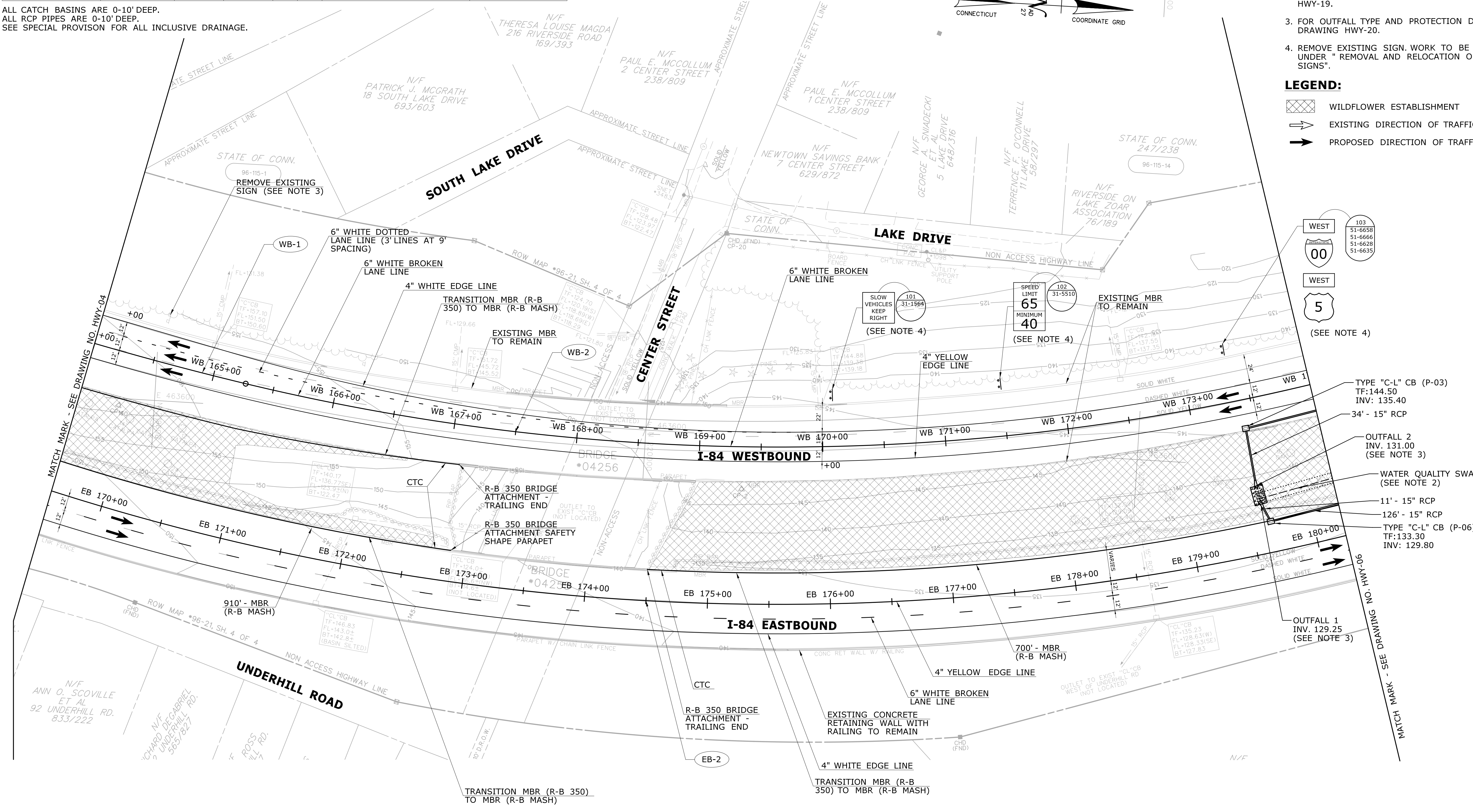
DRAINAGE TABLE

STRUCTURE NUMBER	ALIGNMENT	STATION	OFFSET	SIDE	TYPE	INVERT	T.F. ELEVATION
P-3	WESTBOUND	173+41.00	33.46'	RT	"CL"	135.40	144.50
P-6	EASTBOUND	179+66.00	25.20'	LT	"CL"	129.80	133.30

ALL CATCH BASINS ARE 0-10' DEEP.
ALL RCP PIPES ARE 0-10' DEEP.
SEE SPECIAL PROVISION FOR ALL INCLUSIVE DRAINAGE.

- NOTES:**
- FOR CURVE DATA, SEE DRAWING HWY-03.
 - FOR WATER QUALITY SWALE DETAILS SEE DRAWING HWY-19.
 - FOR OUTFALL TYPE AND PROTECTION DETAILS SEE DRAWING HWY-20.
 - REMOVE EXISTING SIGN. WORK TO BE PAID FOR UNDER "REMOVAL AND RELOCATION OF EXISTING SIGNS".

- LEGEND:**
- WILDFLOWER ESTABLISHMENT
 - EXISTING DIRECTION OF TRAFFIC
 - PROPOSED DIRECTION OF TRAFFIC



THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.	DESIGNER/DRAFTER: J. HUND	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION	SIGNATURE/ BLOCK:	PROJECT TITLE: REHABILITATION OF BRIDGE NOS 01218 & 04180 - I-84 EB/WB OVER HOUSATONIC RIVER	TOWN: NEWTOWN/SOUTHURY	PROJECT NO. 96-201
	CHECKED BY: S. SUEHR				SCALE IN FEET SCALE 1"=40'	DRAWING NO. HWY-05
REV. DATE REVISION DESCRIPTION SHEET NO. Plotted Date: 9/11/2019	File name: ...VHW_MSH_0096_0201_RDP_PLN-02.dgn		LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067		DRAWING TITLE: HIGHWAY PLAN	

GRANITE STONE TRANS. CURBING (GSTC)

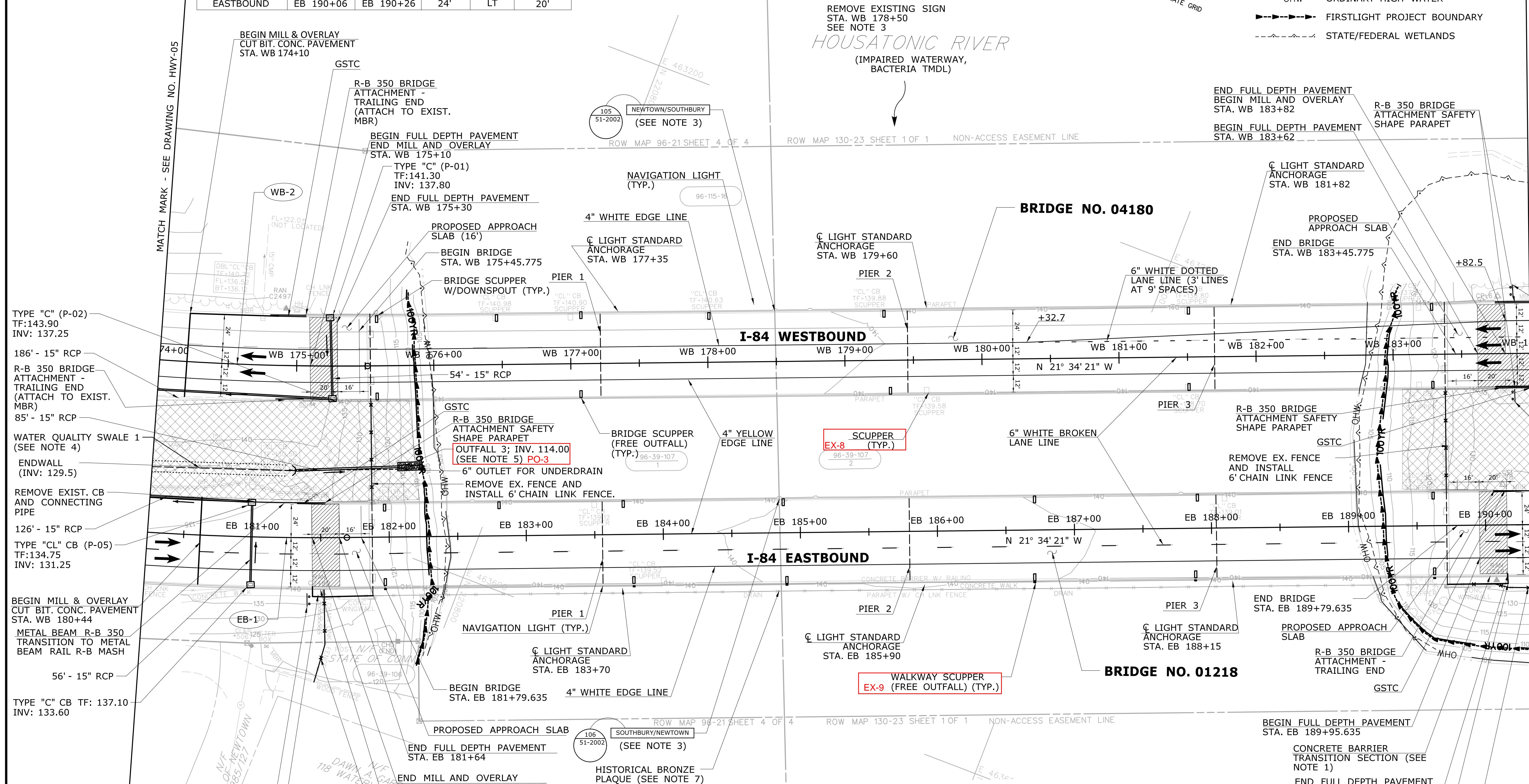
LOCATION	STATION	STATION	OFFSET	SIDE	LENGTH
WESTBOUND	WB 174+86	WB 175+06	36'	LT	20'
WESTBOUND	WB 174+86	WB 175+06	24'	RT	20'
WESTBOUND	WB 183+74	WB 183+94	36'	LT	20'
WESTBOUND	WB 183+74	WB 183+94	24'	RT	20'
EASTBOUND	EB 181+33	EB 181+53	24'	LT	20'
EASTBOUND	EB 190+06	EB 190+26	24'	LT	20'

LEGEND:

- WILDFLOWER ESTABLISHMENT
- FULL DEPTH PAVEMENT REPLACEMENT
- 100YR - FEMA 100-YEAR FLOOD (CALCULATED)
- OHW - ORDINARY HIGH WATER
- FIRSTLIGHT PROJECT BOUNDARY
- STATE/FEDERAL WETLANDS

NOTES:

1. FOR CONCRETE BARRIER TRANSITION SECTION DETAIL, SEE SUBSET 04.02.
2. FOR CURVE DATA, SEE DRAWING HWY-03.
3. EXISTING BRIDGE MOUNTED TOWN SIGNS SHALL BE REMOVED AND REPLACED WITH PARAPET MOUNTED PLACARDS, AS DIRECTED BY STATE. WORK TO BE PAID FOR UNDER "REMOVAL OF SUPERSTRUCTURE".
4. FOR WATER QUALITY SWALE DETAILS SEE DRAWINGS HWY-18 & 19.
5. FOR OUTFALL TYPE AND PROTECTION DETAILS, SEE DRAWING HWY-20.
6. REMOVE EXISTING SIGN. WORK TO BE PAID FOR UNDER "REMOVAL AND RELOCATION OF EXISTING SIGNS". WORK TO BE PAID FOR UNDER "REMOVAL AND RELOCATION OF EXISTING SIGNS".
7. REMOVE, STORE AND RESET HISTORICAL BRONZE PLAQUE. WORK TO BE PAID FOR UNDER "REMOVAL AND RELOCATION OF EXISTING SIGNS".
8. SEE ILL-03 FOR ELECTRICAL ITEMS.



DRAINAGE TABLE

STRUCTURE NUMBER	ALIGNMENT	STATION	OFFSET	SIDE	TYPE	INVERT	T.F. ELEVATION
P-1	WESTBOUND	175+24.25	36.00'	LT	"C"	137.80	141.30
P-2	WESTBOUND	175+26.35	24.00'	RT	"C"	137.25	143.90
P-4	EASTBOUND	180+99.20	36.00'	LT	"C"	133.60	137.10
P-5	EASTBOUND	181+00.00	24.00'	RT	"CL"	131.25	134.75

ALL CATCH BASINS ARE 0-10' DEEP
 ALL RCP PIPES ARE 0-10' DEEP.
 SEE SPECIAL PROVISION FOR ALL INCLUSIVE DRAINAGE.

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

DESIGNER/DRAFTER: J. HUND
 CHECKED BY: S. SUEHR

SCALE IN FEET
 0 40 80
 SCALE 1"=40'

Plotted Date: 9/11/2019

STATE OF CONNECTICUT
 DEPARTMENT OF TRANSPORTATION

Signature/Block: LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067

PROJECT TITLE:
REHABILITATION OF BRIDGE NOS 01218 & 04180 - I-84 EB/WB OVER HOUSATONIC RIVER

TOWN: **NEWTOWN/SOUTHBURY**
 PROJECT NO.: **96-201**
 DRAWING NO.: **HWY-06**
 SHEET NO.: **03.06**

DRAINAGE TABLE

STRUCTURE NUMBER	ALIGNMENT	STATION	OFFSET	SIDE	TYPE	INVERT	T.F. ELEVATION
P-7	WESTBOUND	184+20.00	36.00'	LT	"C"	134.00	137.50
P-8	WESTBOUND	184+20.78	24.00'	RT	"CL"	133.45	137.25
P-9	EASTBOUND	190+63.40	36.00'	RT	"C"	132.15	135.65
P-10	EASTBOUND	190+63.60	23.36'	LT	"CL"	131.60	135.90
P-11	WESTBOUND	186+00.00	36.00'	LT	"C"	134.10	137.60
P-12	WESTBOUND	186+00.00	24.00'	RT	"CL"	132.75	136.25
P-13	EASTBOUND	197+38.00	45.70	LT	"C-L" DBL	132.30	137.25
E-1	EASTBOUND	195+51.30	54.20	LT	EXISTING	129.2	132.27

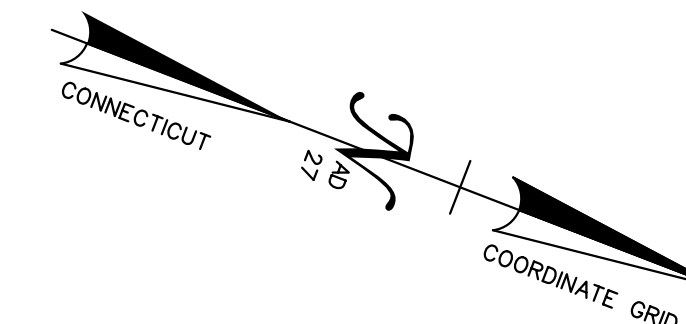
ALL CATCH BASINS ARE 0-10' DEEP.
ALL RCP PIPES ARE 0-10' DEEP.
SEE SPECIAL PROVISION FOR ALL INCLUSIVE DRAINAGE.

BIT. CONC. PARK CURB (BCPC)

LOCATION	STATION	STATION	OFFSET	SIDE	LENGTH
WESTBOUND	183+75	186+15	36'	LT	240'

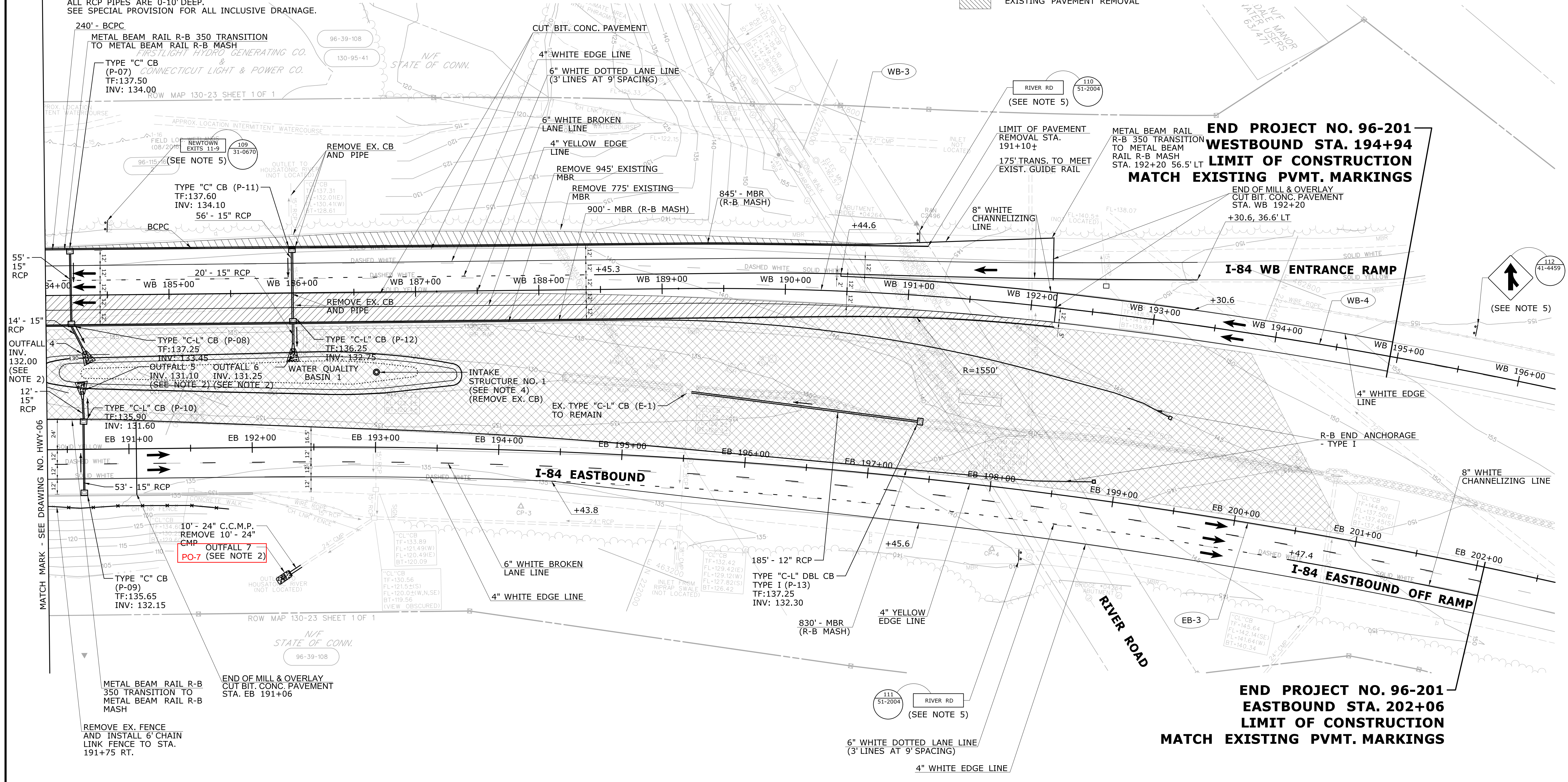
LEGEND:

- WILDFLOWER ESTABLISHMENT
- FULL DEPTH PAVEMENT REPLACEMENT
- EXISTING PAVEMENT REMOVAL



NOTES:

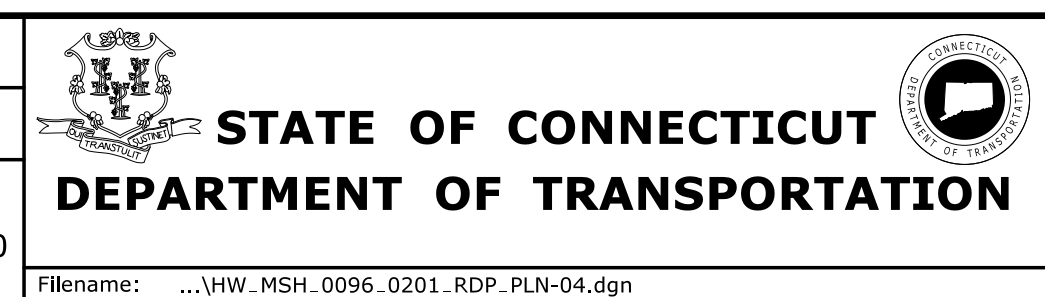
1. FOR CURVE DATA, SEE DRAWING HWY-03.
2. FOR OUTFALL TYPE AND PROTECTION DETAILS, SEE DRAWING HWY-20.
3. FOR WARER QUALITY BASIN GRADING, SEE DRAWING HWY-18.
4. FOR INTAKE STRUCTURE DETAILS SEE DRAWING HWY-19.
5. REMOVE EXISTING SIGN. WORK TO BE PAID FOR UNDER "REMOVAL AND RELOCATION OF EXISTING SIGNS".



REV.	DATE	REVISION DESCRIPTION	SHEET NO.

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

DESIGNER/DRAFTER:
J. HUND
CHECKED BY:
S. SUEHR
SCALE IN FEET
0 40 80
SCALE 1"=40'



SIGNATURE/BLOCK:
LOUIS BERGER
A WSP COMPANY
55 CAPITAL BOULEVARD
ROCKY HILL, CT 06067

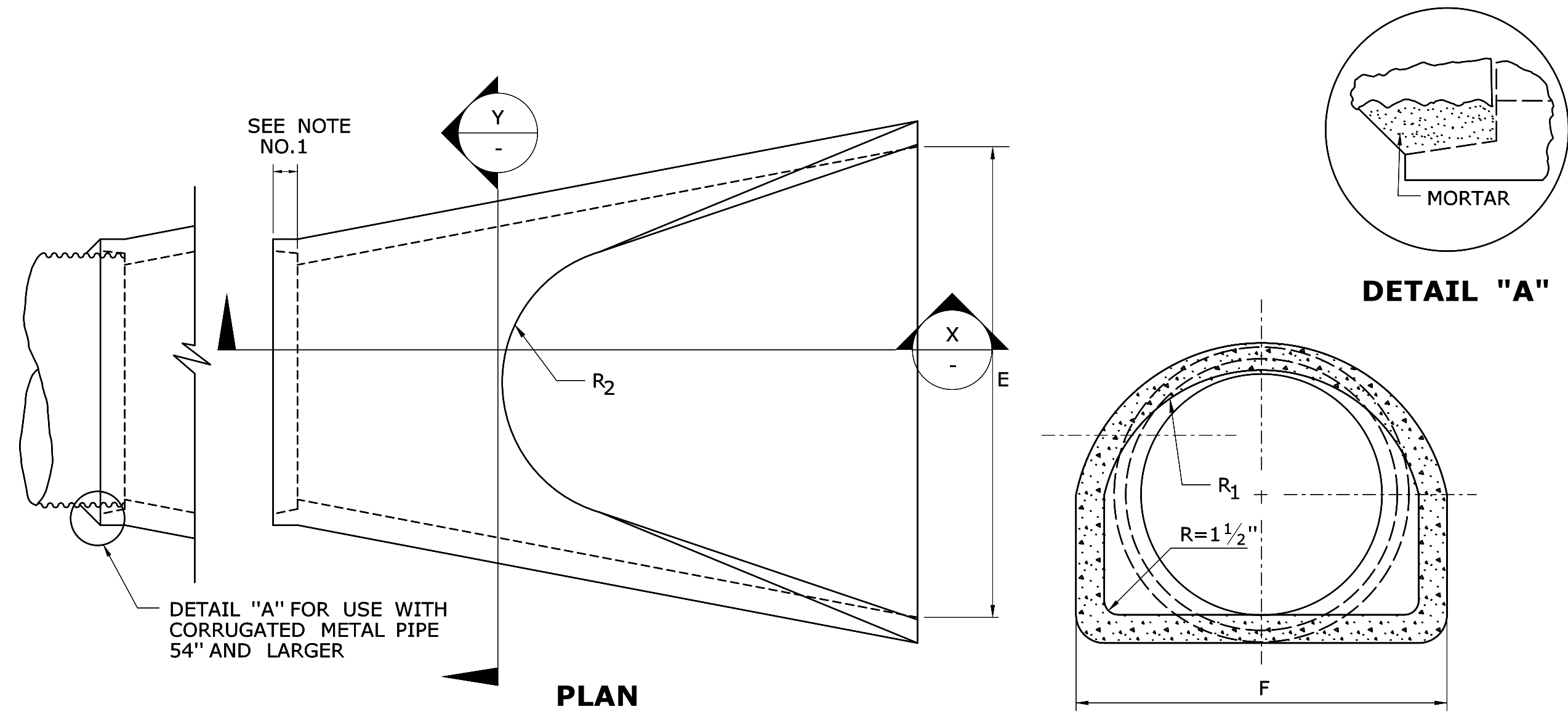
PROJECT TITLE:
REHABILITATION OF BRIDGE NOS 01218 & 04180 - I-84 EB/WB OVER HOUSATONIC RIVER

TOWN:
NEWTOWN/SOUTHBURY
DRAWING TITLE:
HIGHWAY PLAN

PROJECT NO.
96-201
DRAWING NO.
HWY-07
SHEET NO.
03.07

GENERAL NOTES:

- JOINTS SHALL BE TONGUE AND GROOVE OR BELL AND SPIGOT AS REQUIRED TO CONFORM TO PIPE INSTALLED.
- WALL THICKNESS SHALL CONFORM TO PIPE THICKNESS.

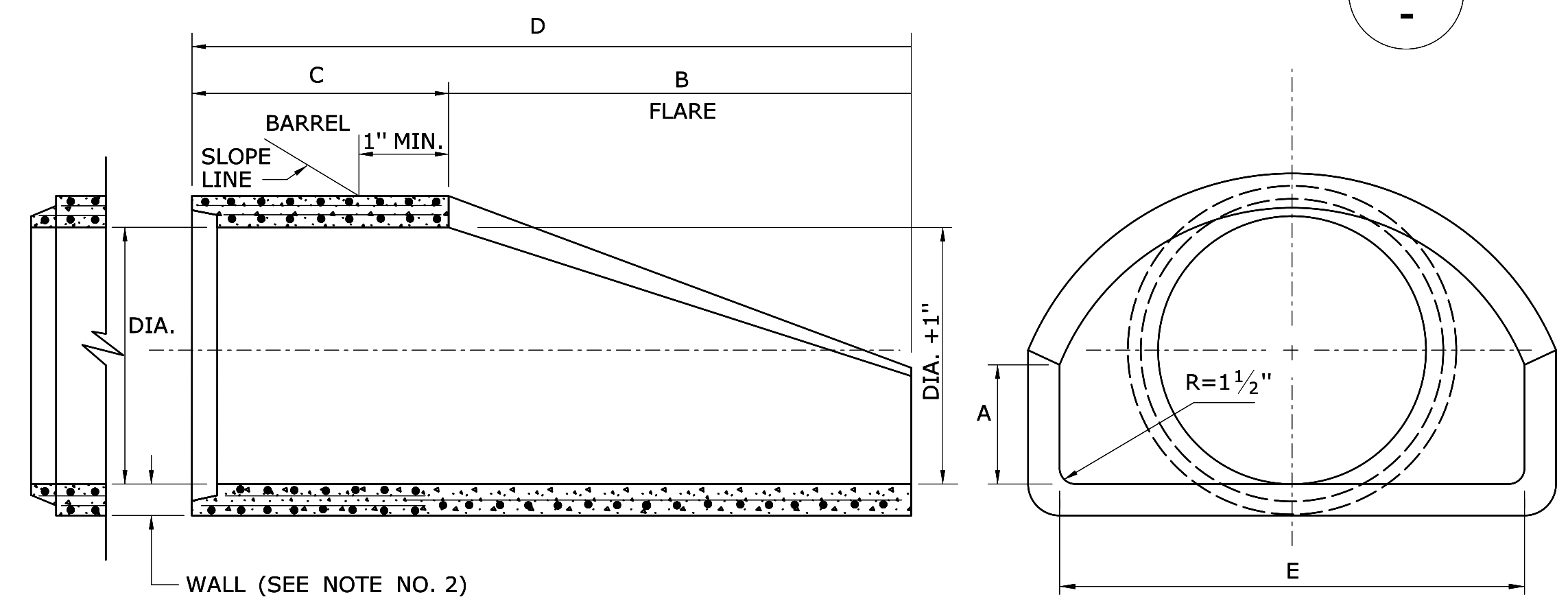


DETAIL "A" FOR USE WITH CORRUGATED METAL PIPE 54" AND LARGER

PLAN

DETAIL "A"

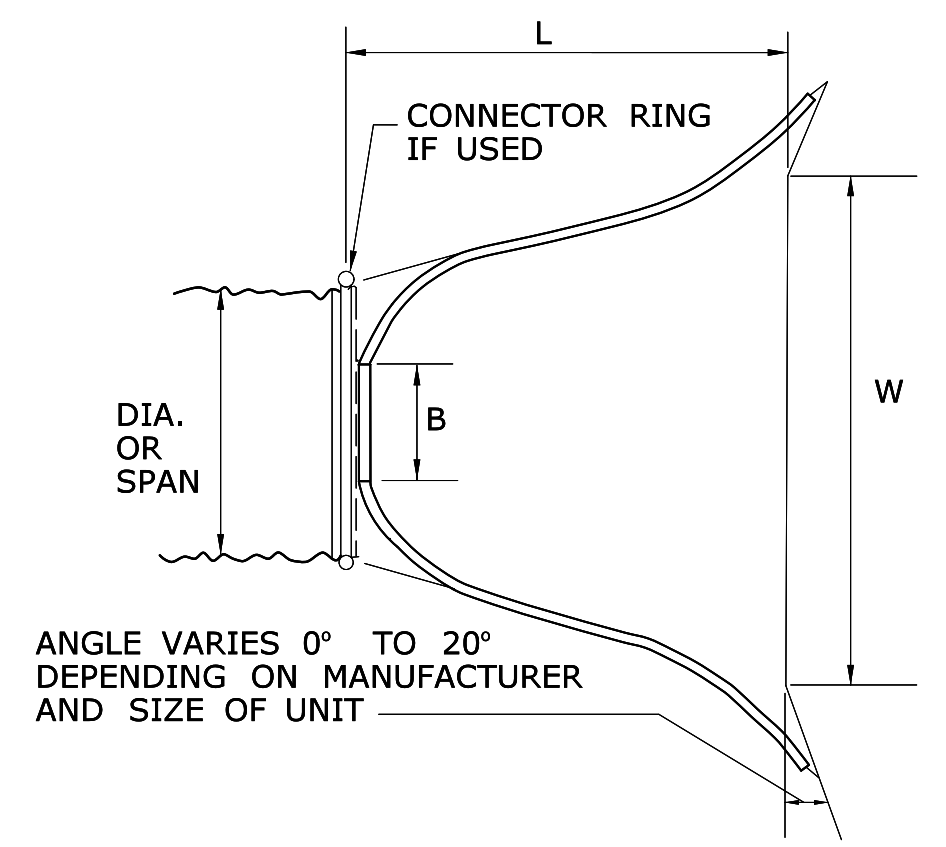
SECTION Y



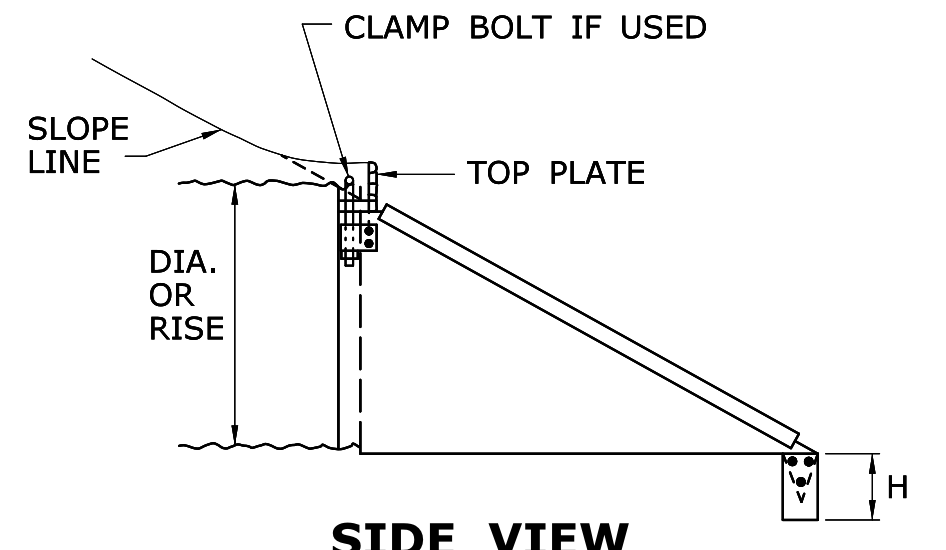
SECTION X

REINFORCED CONCRETE PIPE END

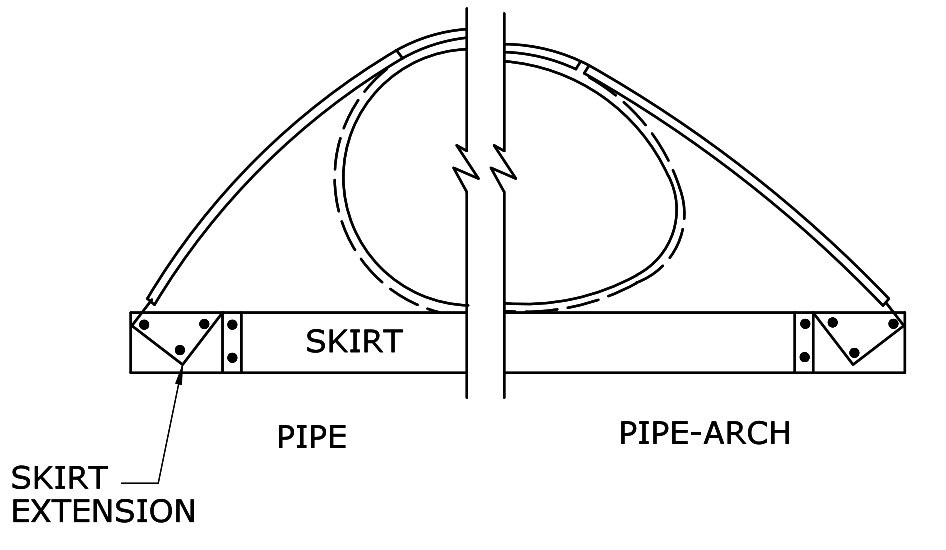
END VIEW



PLAN

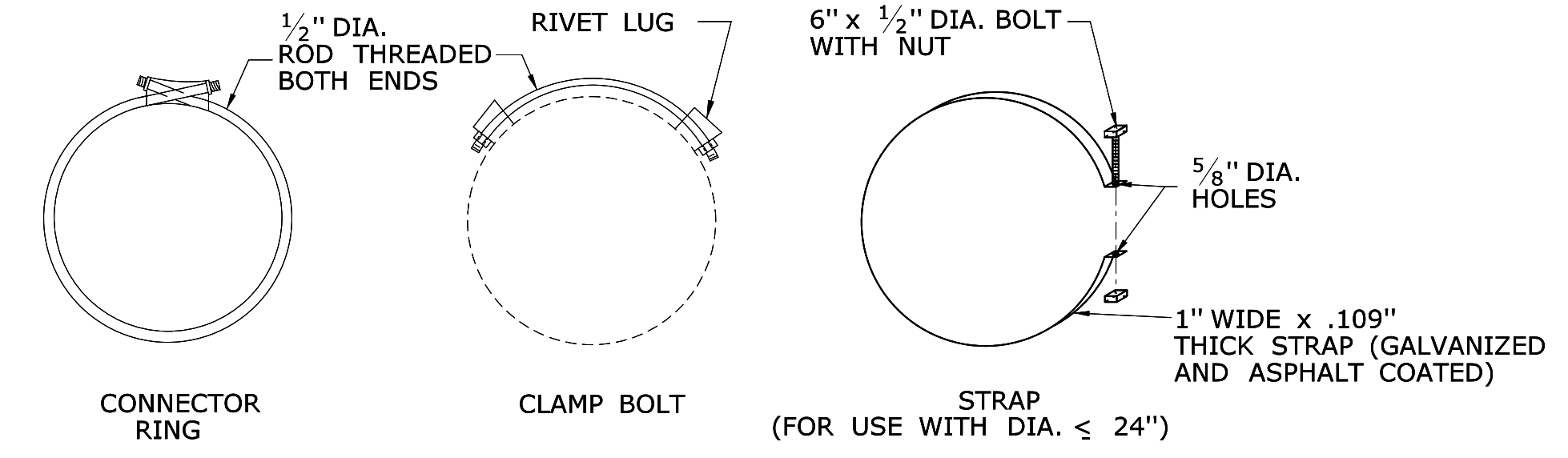


SIDE VIEW

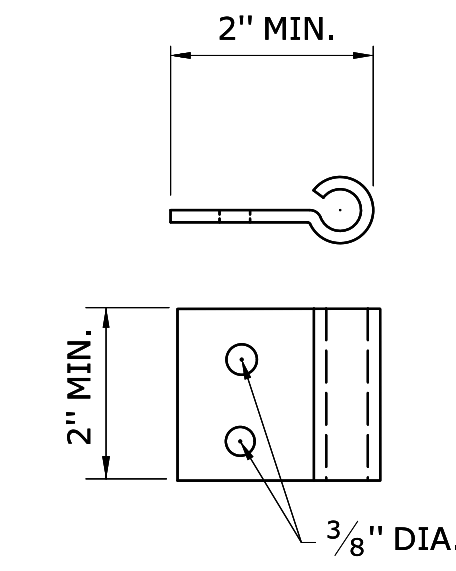


END VIEW

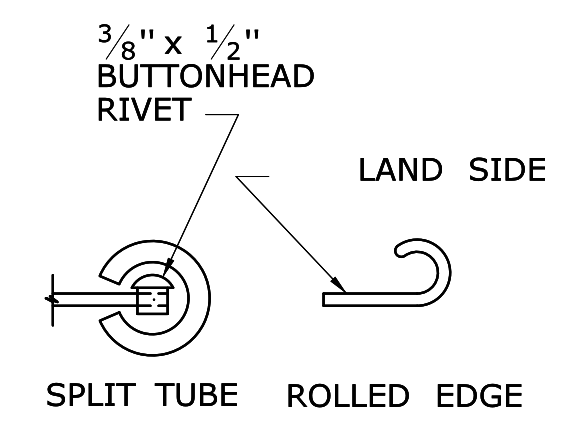
METAL PIPE END



ATTACHMENT SYSTEMS



RIVET LUG



EDGE REINFORCEMENT

DIA.	DIMENSIONS FOR REINFORCED CONCRETE PIPE END								FLARE REINFORCEMENT	
	A	B	C	D	E	F	R ₁	R ₂	MIN. AREA OF LONGITUDINAL STEEL SQ. IN. PER FT.	MIN. AREA OF TRANSVERSE STEEL SQ. IN. PER FT.
12"	4"	2'-0"	4'-0 ³ / ₈ "	6'-0 ³ / ₈ "	2'-0"	1'-7 ¹⁵ / ₁₆ "	10 ¹ / ₄ "	9"	0.048	0.048
15"	6"	2'-3"	3'-10"	6'-1"	2'-6"	2'-0 ⁵ / ₁₆ "	1'-0 ¹ / ₂ "	11"	0.054	0.054
18"	9"	2'-3"	3'-10"	6'-1"	3'-0"	2'-5"	1'-3 ¹ / ₂ "	1'-0"	0.060	0.060
21"	9"	2'-11"	3'-2"	6'-1"	3'-6"	2'-7 ¹ / ₂ "	1'-4"	1'-1"	0.066	0.066
24"	9 ¹ / ₂ "	3'-7 ¹ / ₂ "	2'-6"	6'-1 ¹ / ₂ "	4'-0"	2'-9 ³ / ₁₆ "	1'-4 ¹³ / ₁₆ "	1'-2"	0.072	0.072
30"	1'-0"	4'-6"	1'-7 ³ / ₄ "	6'-1 ³ / ₄ "	5'-0"	3'-1"	1'-6 ¹ / ₂ "	1'-3"	0.084	0.084
36"	1'-3"	5'-3"	2'-10 ³ / ₄ "	8'-1 ³ / ₄ "	6'-0"	3'-11 ¹³ / ₁₆ "	2'-0 ⁵ / ₁₆ "	1'-8"	0.096	0.096
42"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	4'-5 ⁷ / ₈ "	2'-3 ¹ / ₂ "	1'-10"	0.108	0.108
48"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	4'-8 ¹ / ₂ "	2'-4 ¹ / ₂ "	1'-10"	0.120	0.120
54"	2'-3"	5'-5"	2'-11"	8'-4"	7'-6"	5'-5 ¹ / ₂ "	2'-9 ¹ / ₈ "	2'-0"	0.132	0.132
60"	2'-9"	5'-0"	3'-3"	8'-3"	8'-0"	6'-0 ¹ / ₂ "	3'-0 ¹¹ / ₁₆ "	2'-0"	0.144	0.144

PIPE DIA.	DIMENSIONS FOR METAL PIPE END				THICKNESS INS.
	B (MAX.)	H#1"	L#1 ¹ / ₂ "	W#2"	
12"	6"	6"	21"	24"	.064
15"	8"	6"	26"	30"	.064
18"	10"	6"	31"	36"	.064
21"	12"	6"	36"	42"	.064
24"	13"	6"	41"	48"	.064
30"	16"	8"	51"	60"	.079
36"	19"	9"	60"	72"	.079
42"	22"	11"	69"	84"	.109
48"	27"	12"	78"	90"	.109
54"	30"	12"	84"	102"	.109
60"	33"	12"	87"	114"	.109
66"	36"	12"	87"	120"	.109
72"	39"	12"	87"	126"	.109
78"	42"	12"	87"	132"	.109
84"	45"	12"	87"	138"	.109

PIPE ARCH SIZE		DIMENSIONS FOR METAL PIPE END				THICKNESS INS.
SPAN	RISE	B (MAX.)	H#1"	L#1 ¹ / ₂ "	W#2"	
17"	13"	9"	6"	19"	30"	.064
21"	15"	10"	6"	23"	36"	.064
24"	18"	12"	6"	28"	42"	.064
28"	20"	14"	6"	32"	48"	.064
35"	24"	16"	6"	39"	60"	.079
42"	29"	18"	8"	46"	75"	.079
49"	33"	21"	9"	53"	85"	.109
57"	38"	26"	12"	63"	90"	.109
64"	43"	30"	12"	70"	102"	.109
71"	47"	33"	12"	77"	114"	.109

DESIGNER/DRAFTER: J. HUND
 CHECKED BY: S. SUEHR
 SCALE AS NOTED

STATE OF CONNECTICUT
 DEPARTMENT OF TRANSPORTATION

LOUIS BERGER
 A WSP COMPANY
 55 CAPITAL BOULEVARD
 ROCKY HILL, CT 06067

PROJECT TITLE: REHABILITATION OF BRIDGE NO'S 01218 & 04180- INTERSTATE 84 OVER HOUSATONIC RIVER

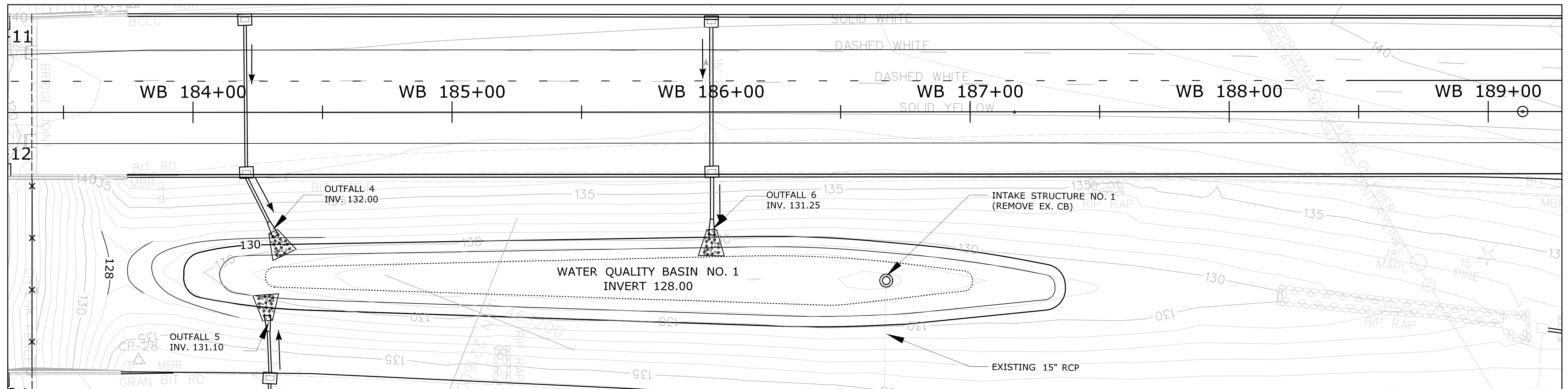
TOWN: NEWTOWN/SOUTHBURY
 DRAWING TITLE: PIPE ENDS

PROJECT NO. 96-201
 DRAWING NO. HWY-17
 SHEET NO.

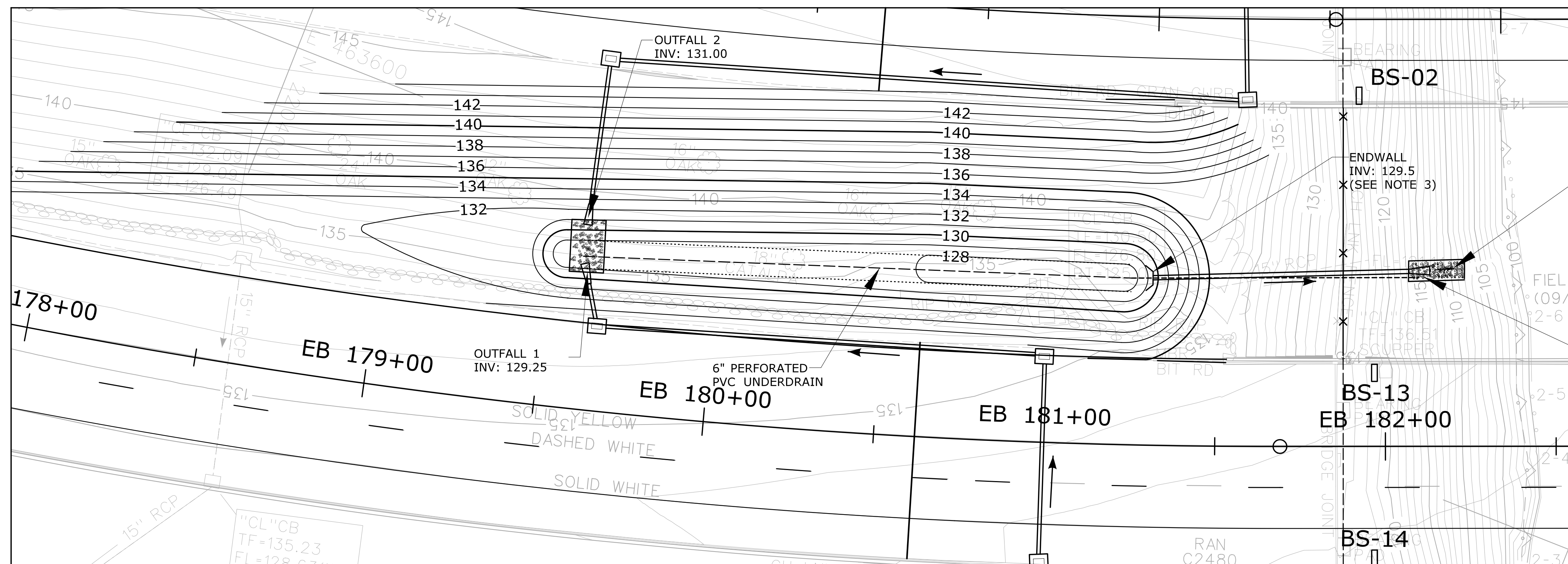
THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.

Plotted Date: 9/11/2019

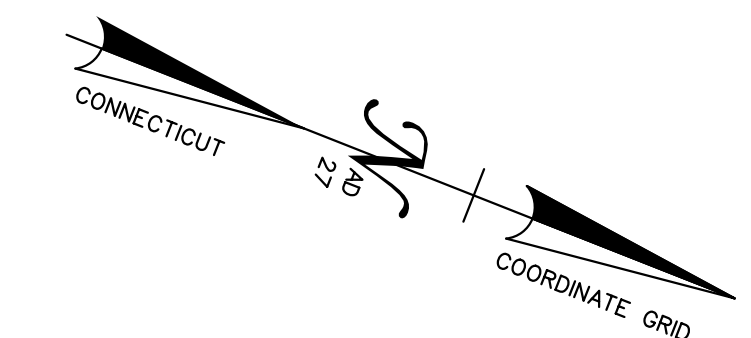
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WATER QUALITY BASIN - 1



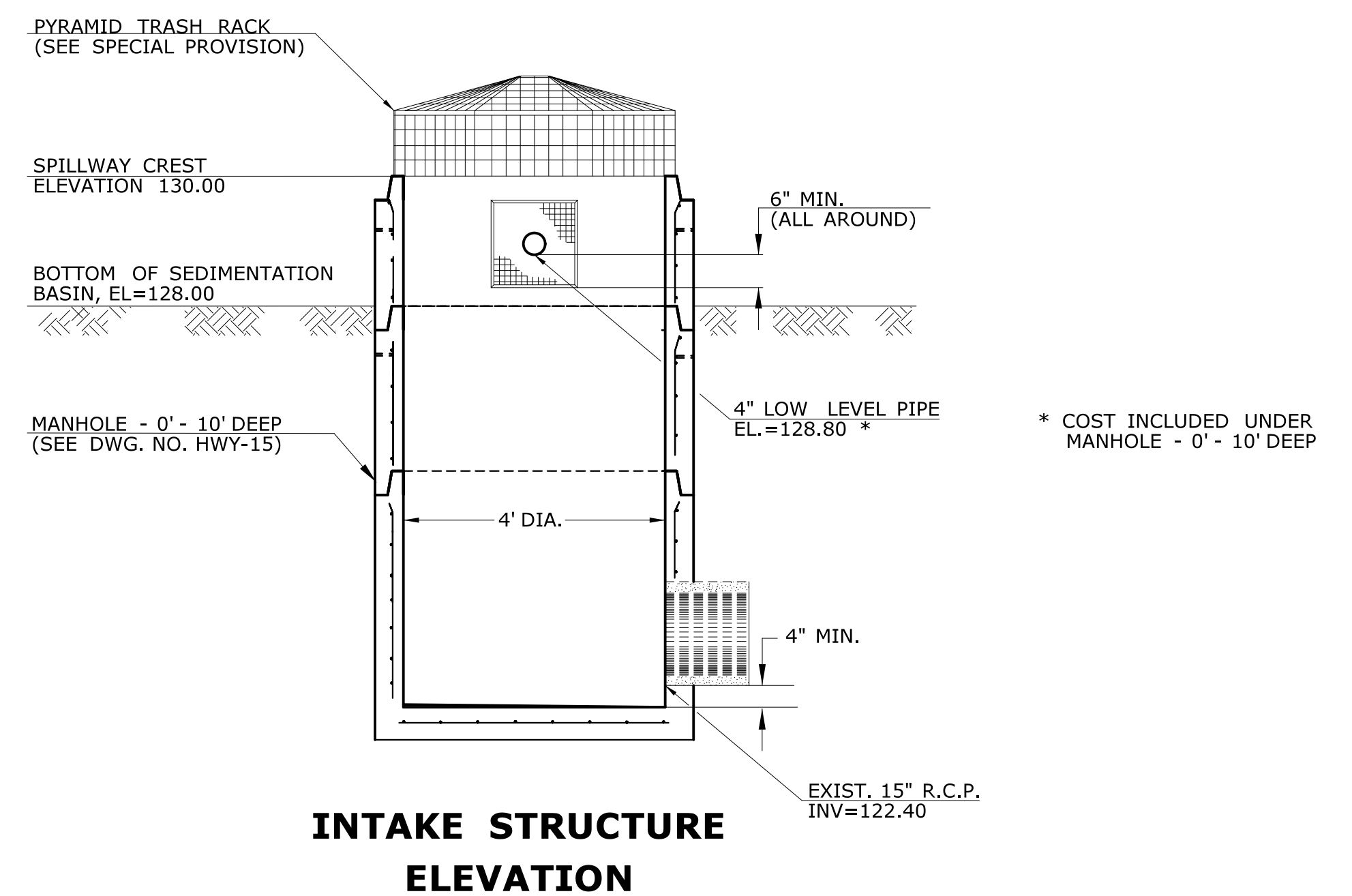
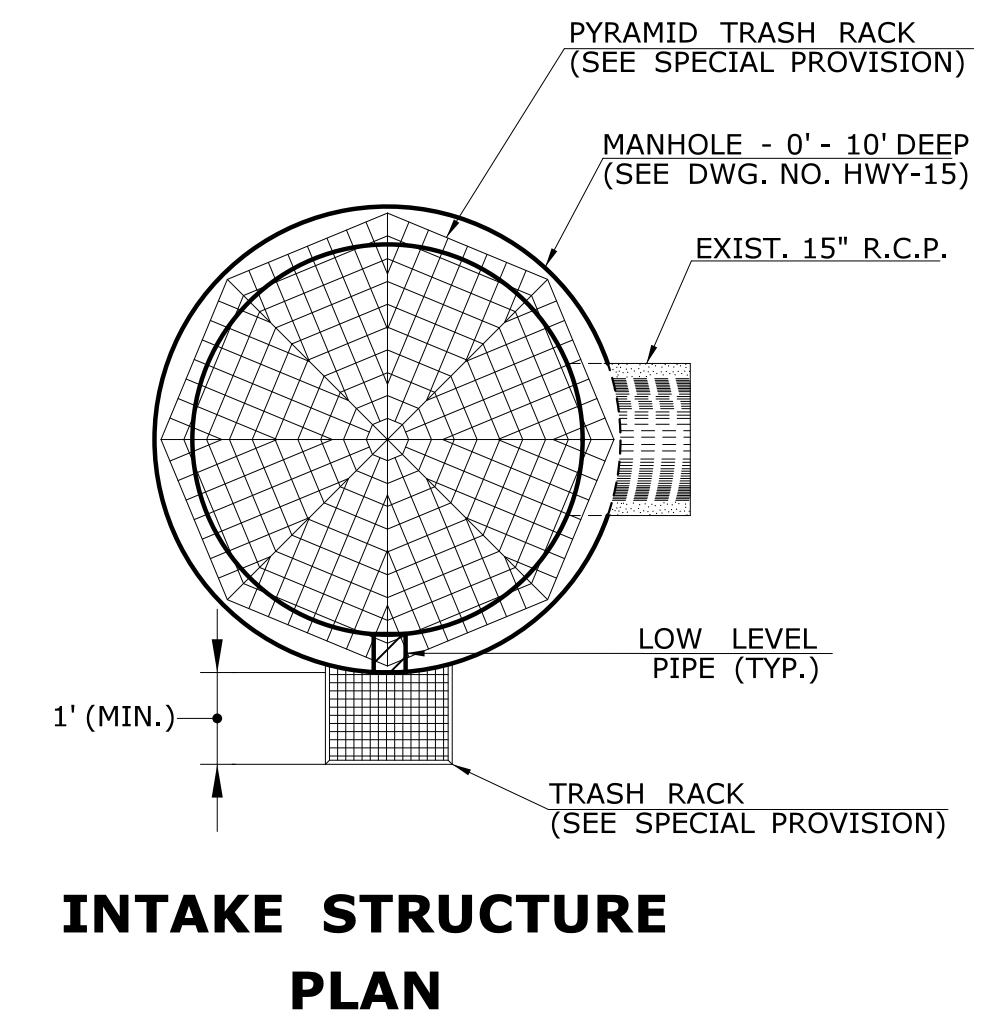
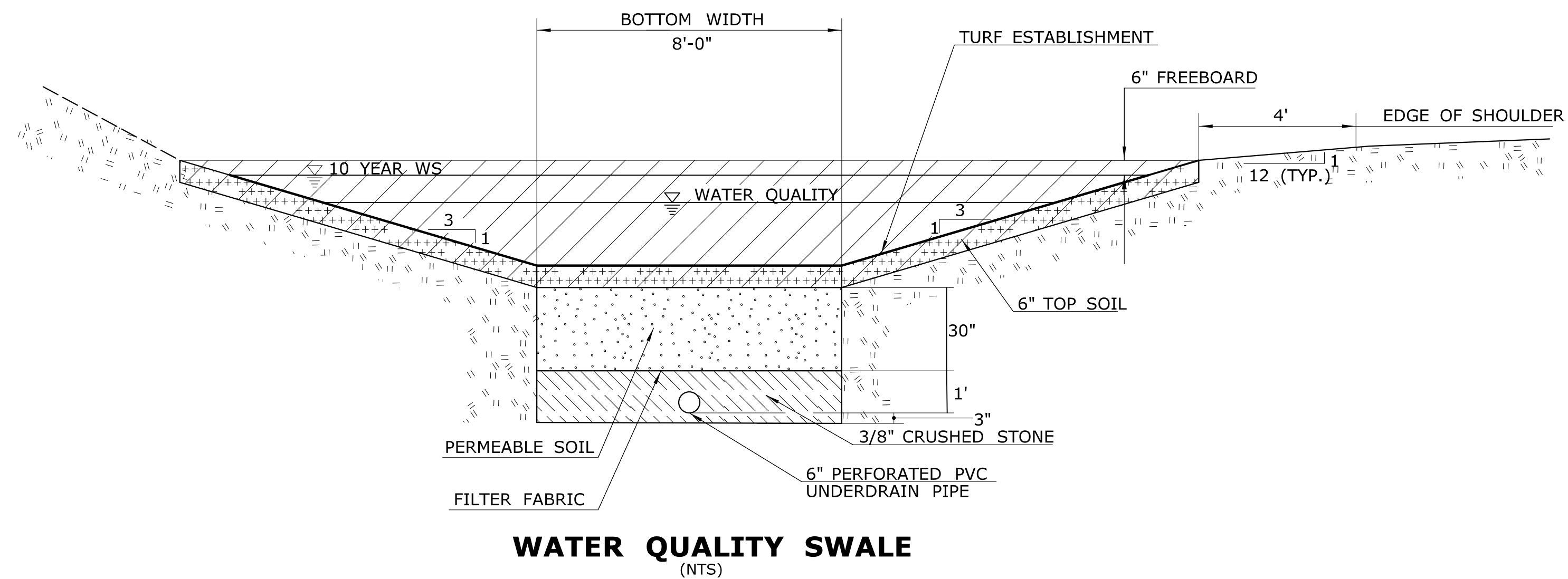
WATER QUALITY SWALE - 1



GENERAL NOTES:

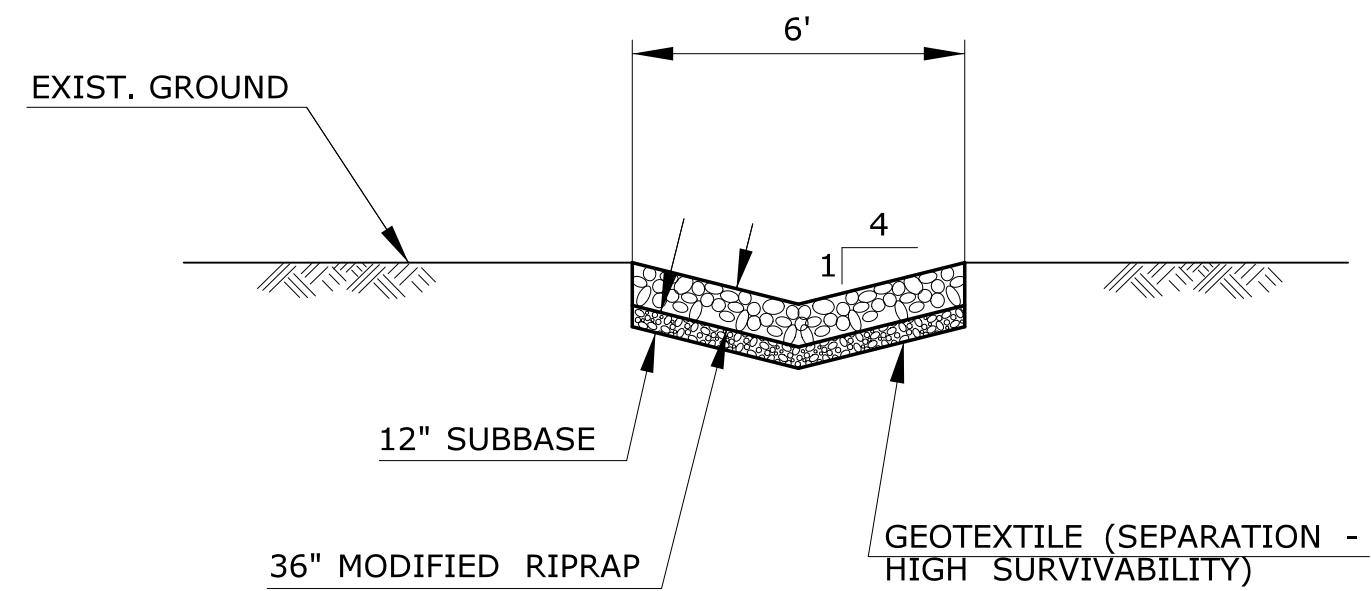
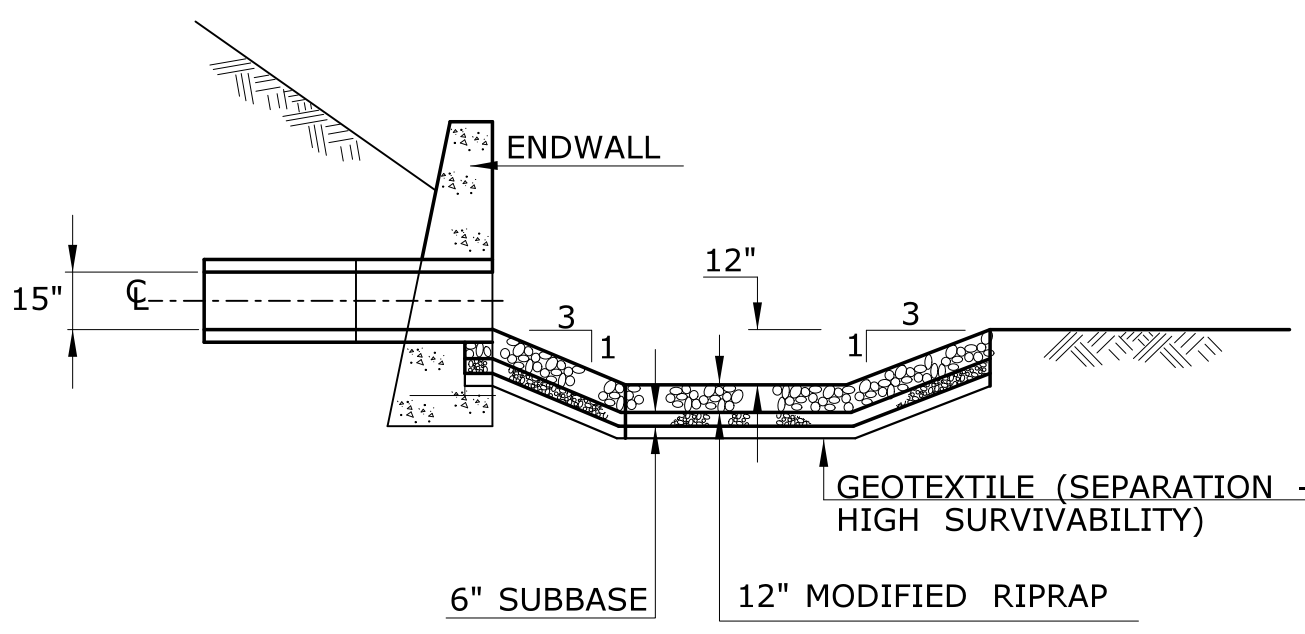
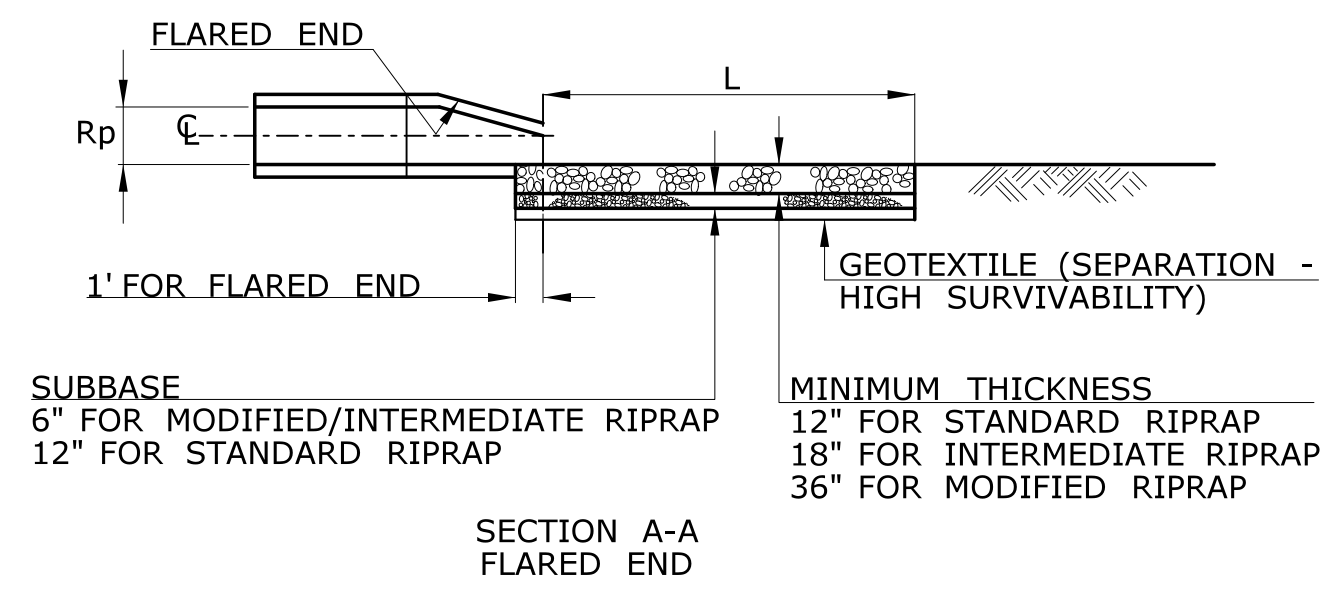
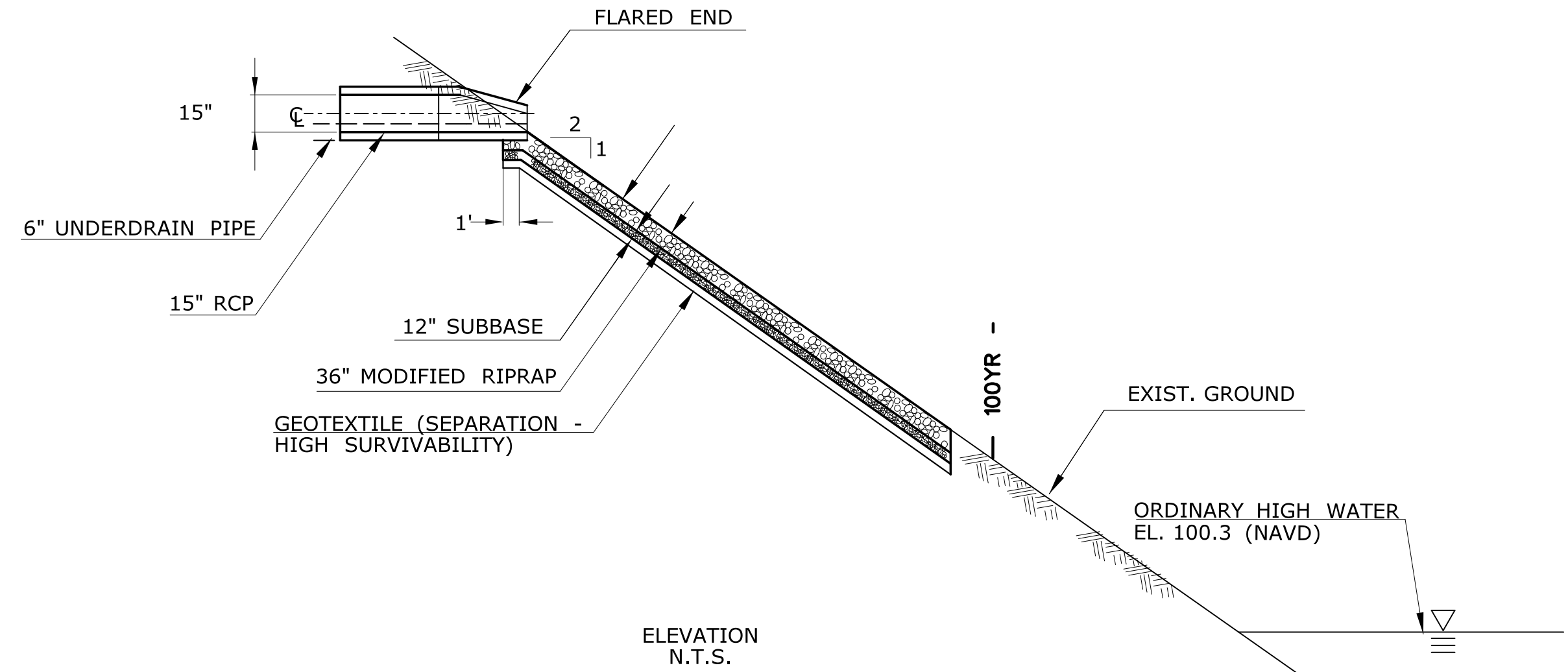
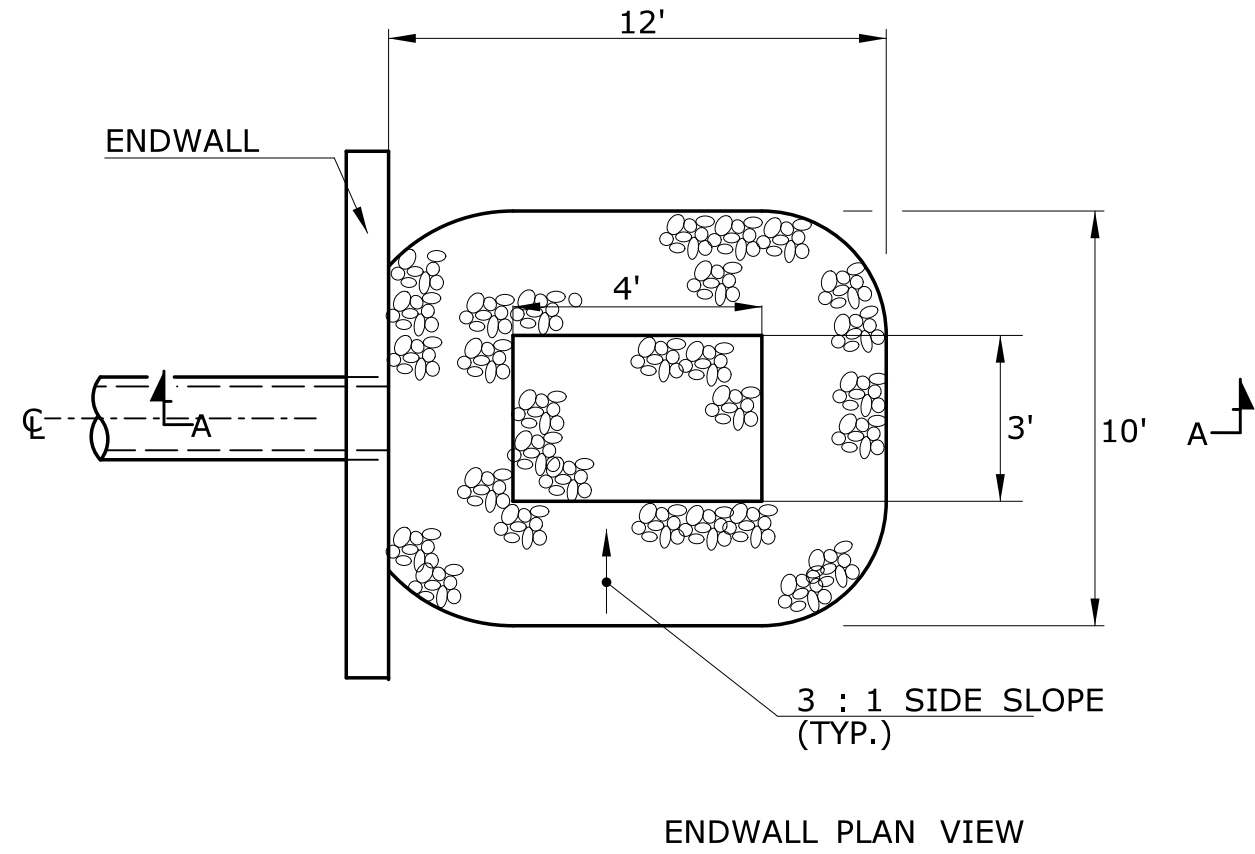
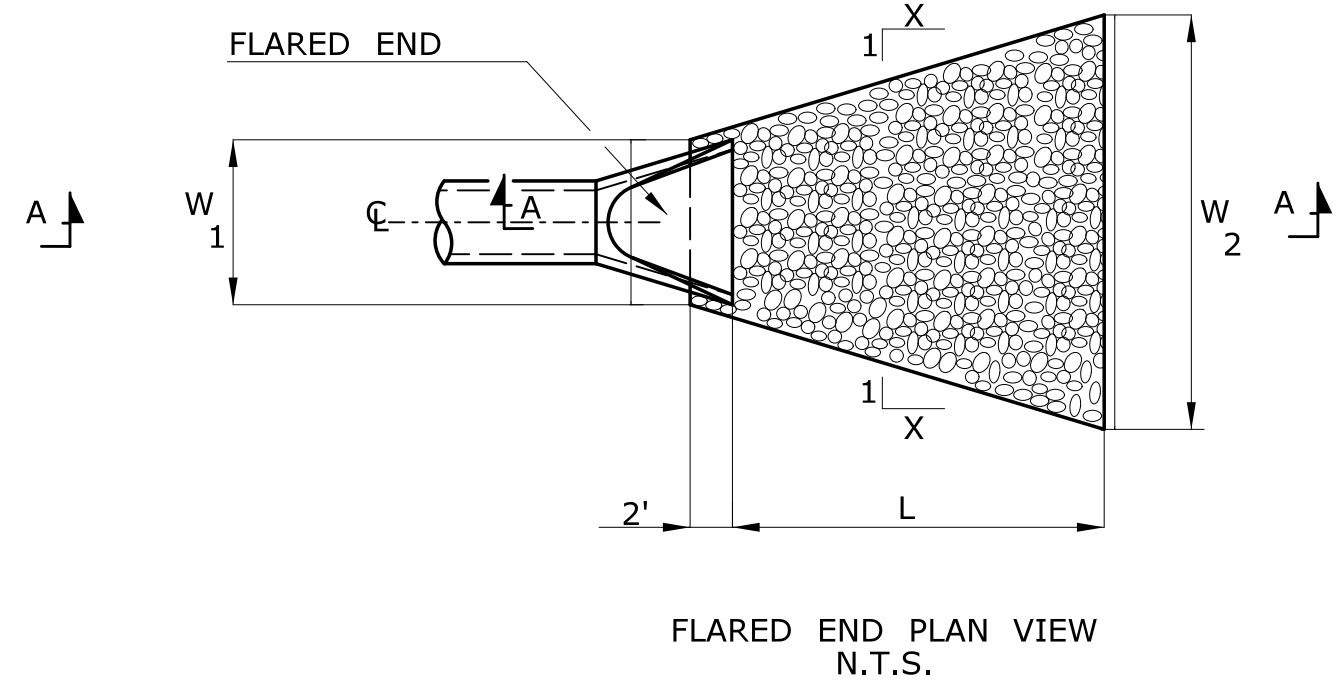
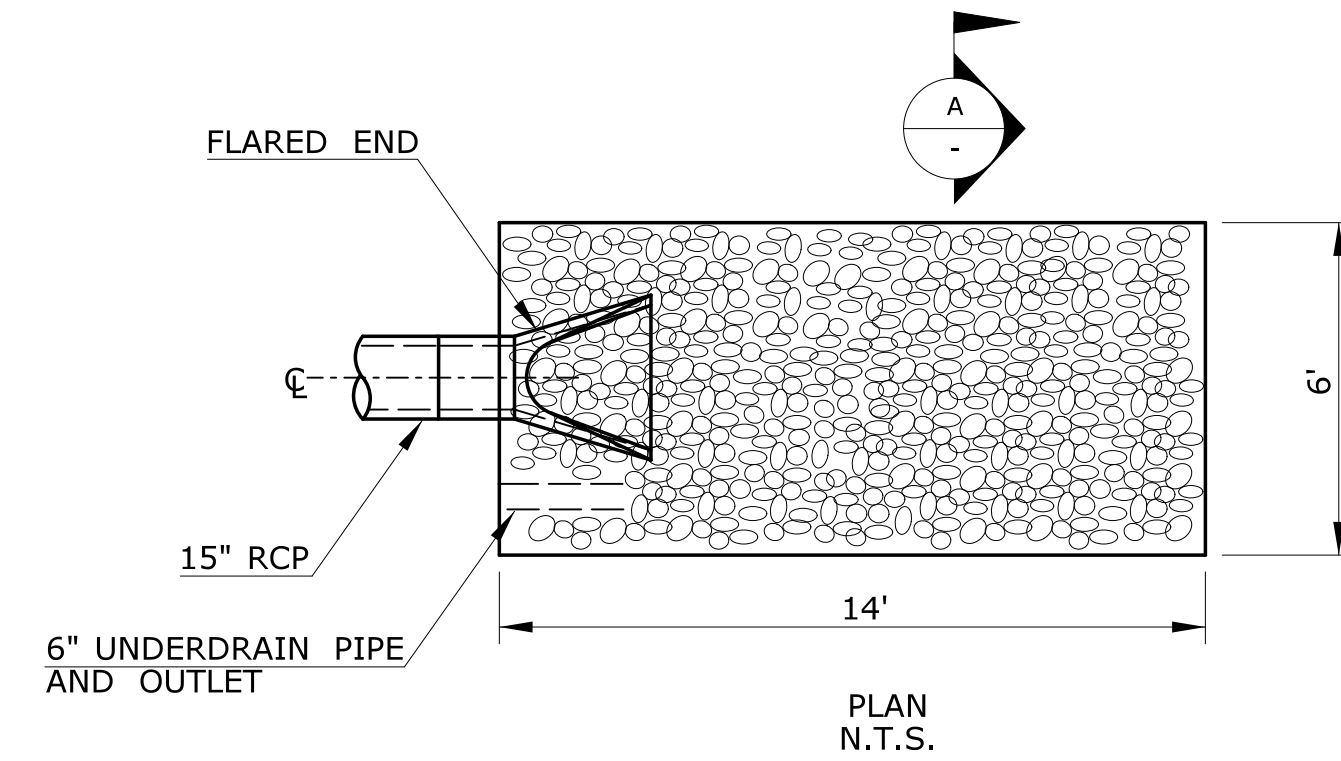
1. FOR OUTFALL DETAILS, SEE DRAWING NO. HWY-20.
2. FOR INTAKE STRUCTURE DETAILS, SEE DRAWING NO. HWY-19.
3. FOR ENDWALL DETAILS SEE HIGHWAY STANDARD SHEETS.

		DESIGNER/DRAFTER: J. HUND	 STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION	SIGNATURE/ BLOCK: LOUIS BERGER US A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067	PROJECT TITLE: REHABILITATION OF BRIDGE NOS 01218 & 04180 - I-84 EB/WB OVER HOUSATONIC RIVER	TOWN: NEWTOWN/SOUTHURY	PROJECT NO. 96-201
		CHECKED BY: S. SUEHR				DRAWING TITLE: GRADING PLAN	DRAWING NO. HWY-18
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 9/11/2019	SCALE IN FEET 0 20 40 SCALE 1"=20'	FILENAME: ...VHW_MSH_0096_0201_MDT-08.dgn	SHEET NO.



THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED.		DESIGNER/DRAFTER: J. HUND CHECKED BY: S. SUEHR SCALE AS NOTED	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION Filename: ...VHW_MSH_0096_0201_MDT-09.dgn	SIGNATURE/ BLOCK: LOUIS BERGER A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067	PROJECT TITLE: REHABILITATION OF BRIDGE NO'S 01218 & 04180- INTERSTATE 84 OVER HOUSATONIC RIVER	TOWN: NEWTOWN/SOUTHBURY	PROJECT NO. 96-201 DRAWING NO. HWY-19 SHEET NO.
REV.	DATE	REVISION DESCRIPTION	SHEET NO.	Plotted Date: 9/11/2019	DRAWING TITLE: MISCELLANEOUS DRAINAGE DETAILS		

OUTFALL	ROADWAY STATION	OFFSET	SHEET	PIPE DIAMETER Rp	INVERT OUTLET END	END TYPE	RIPRAP TYPE	L	W1	W2	X
1	WB 179+61	40.0	HWY-2	15"	129.250	15" RCCE	MODIFIED	10.00	3.75	10.75	3
2	EB 179+60	53.0	HWY-2	15"	131.000	15" RCCE	INTERMEDIATE	10.00	3.75	10.75	3
3	EB 182+10	51.5	HWY-3	15"	114.000	15" RCCE	STANDARD	SEE DETAIL FOR DIMENSIONS			
4	WB 184+31	45.5	HWY-4	15"	132.000	15" RCCE	INTERMEDIATE	10.00	3.75	10.75	3
5	EB 190+63	44.0	HWY-4	15"	131.100	15" RCCE	INTERMEDIATE	10.00	3.75	10.75	3
6	WB 186+00	40.0	HWY-4	15"	131.250	15" RCCE	INTERMEDIATE	10.00	3.75	10.75	3
7	EB 192+30	100.0	HWY-4	15"	EXISTING	END WALL	MODIFIED	SEE DETAIL FOR DIMENSIONS			



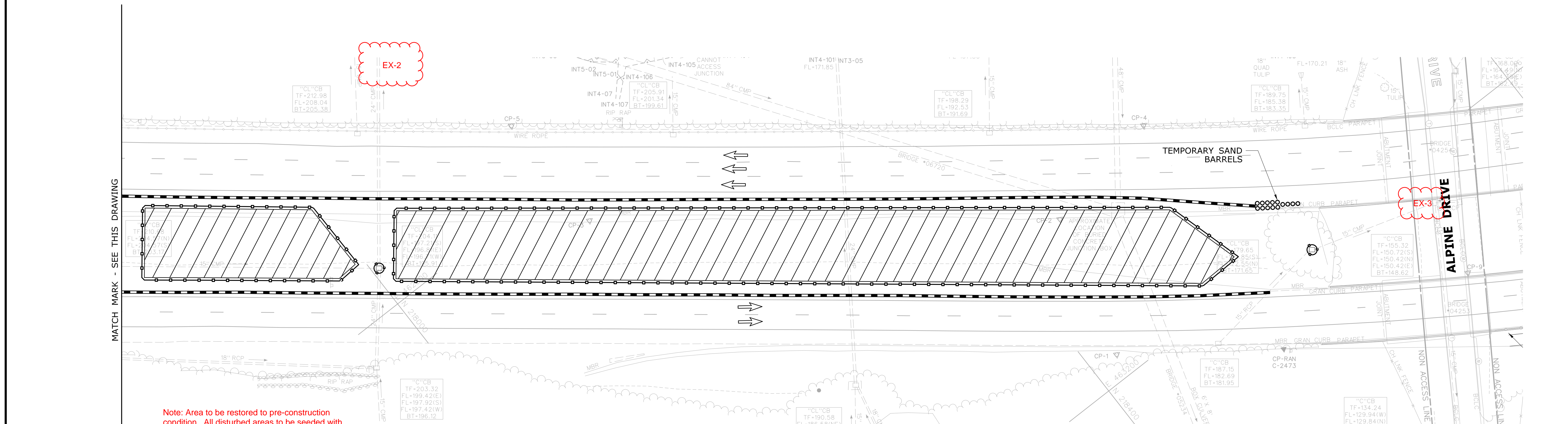
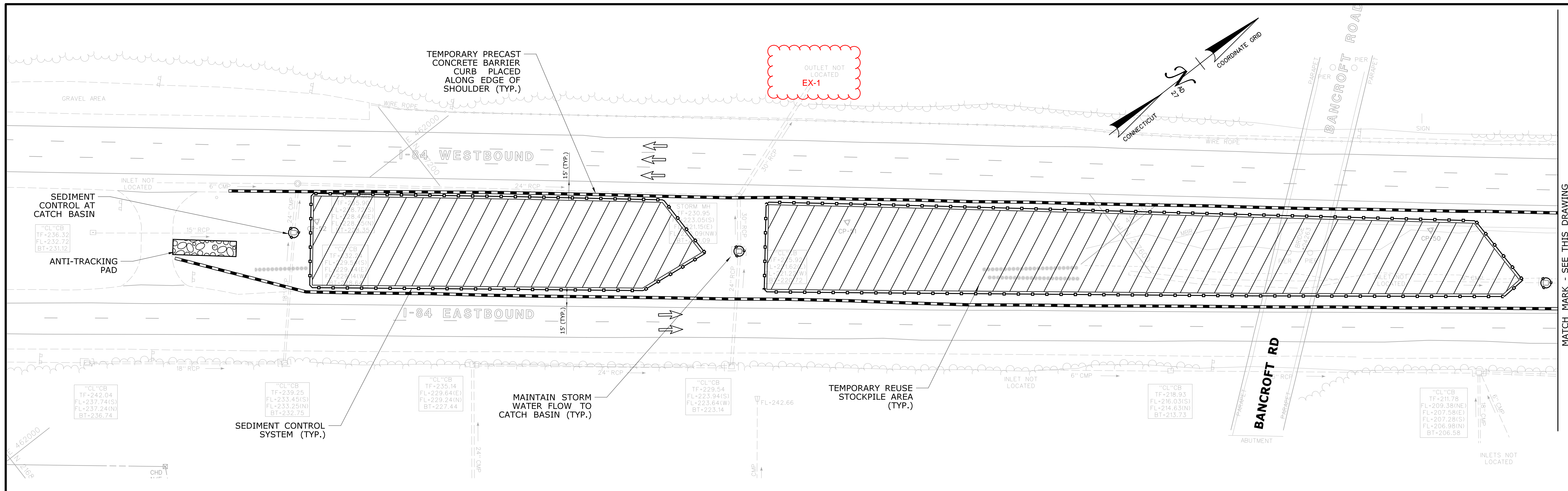
TYPE A RIPRAP APRON
(OUTFALLS 1, 2, 4, 5 & 6)
N.T.S.

PREFORMED SCOUR HOLE
(OUTFALL - 7)
N.T.S.

RIPRAP SWALE
(OUTFALL - 3)
N.T.S.

NOTES:
1. SUBBASE SHALL BE NO. 8 AGGREGATE FOR MODIFIED RIPRAP AND NO. 6 AGGREGATE FOR INTERMEDIATE AND STANDARD RIPRAP.

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATIONS BY THE STATE AND IS IN NO WAY WARRANTED TO INDICATE THE CONDITIONS OF ACTUAL QUANTITIES OF WORK WHICH WILL BE REQUIRED. Plotted Date: 9/11/2019		DESIGNER/DRAFTER: J. HUND CHECKED BY: S. SUEHR SCALE AS NOTED	STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION Filename: ...VHW_MSH_0096_0201_MDT-10.dgn	SIGNATURE/BLOCK: LOUIS BERGER A WSP COMPANY 55 CAPITAL BOULEVARD ROCKY HILL, CT 06067	PROJECT TITLE: REHABILITATION OF BRIDGE NO'S 01218 & 04180- INTERSTATE 84 OVER HOUSATONIC RIVER	TOWN: NEWTOWN/SOUTHBURY DRAWING TITLE: MISCELLANEOUS DRAINAGE DETAILS	PROJECT NO. 96-201 DRAWING NO. HWY-20 SHEET NO.
REV.	DATE	REVISION DESCRIPTION	SHEET NO.				



Note: Area to be restored to pre-construction condition. All disturbed areas to be seeded with wildflower mix. Work will be paid for under the item Wildflower Establishment

REV.	DATE	REVISION DESCRIPTION	SHEET NO.

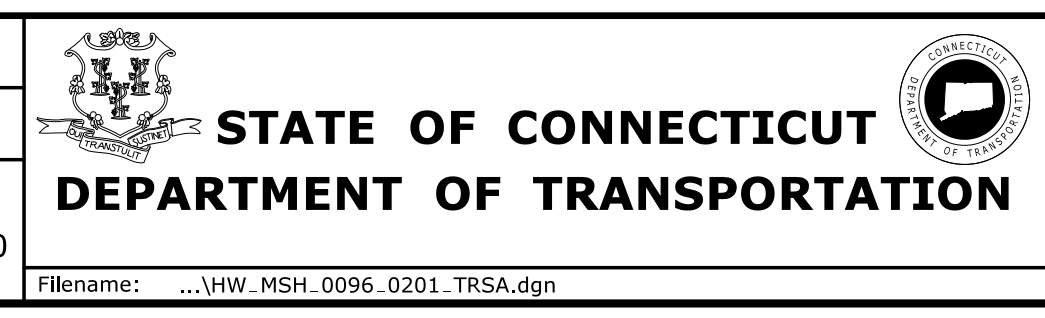
Plotted Date: 11/14/2019

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DESIGNER/DRAFTER:
J. HUND

CHECKED BY:
S. SUEHR

SCALE IN FEET
0 40 80
SCALE 1"=40'



SIGNATURE/BLOCK:
LOUIS BERGER US
A WSP COMPANY
55 CAPITAL BOULEVARD
ROCKY HILL, CT 06067

PROJECT TITLE:
REHABILITATION OF BRIDGE NOS 01218 & 04180 - I-84 EB/WB OVER HOUSATONIC RIVER

TOWN:
NEWTOWN/SOUTHBURY

DRAWING TITLE:
TEMPORARY REUSE STOCKPILE AREAS

PROJECT NO.
96-201

DRAWING NO.
C-10

SHEET NO.

MATCH MARK - SEE THIS DRAWING

MATCH MARK - SEE THIS DRAWING

Appendix B – Stormwater Monitoring Report Form



**Connecticut Department of
Energy & Environmental Protection**
Bureau of Materials Management & Compliance Assurance
Water Permitting & Enforcement Division

**General Permit for the Discharge of Stormwater and Dewatering Wastewaters from
Construction Activities, issued 8/21/13, effective 10/1/13**
Stormwater Monitoring Report

SITE INFORMATION

Permittee: _____
 Mailing Address: _____
 Business Phone: _____ ext.: _____ Fax: _____
 Contact Person: _____ Title: _____
 Site Name: _____
 Site Address: _____
 Receiving Water (name, basin): _____
 Stormwater Permit No. GSN _____

SAMPLING INFORMATION (Submit a separate form for each outfall)

Outfall Designation: _____ Date/Time Collected: _____
 Outfall Location(s) (lat/lon or map link): _____
 Person Collecting Sample: _____
 Storm Magnitude (inches): _____ Storm Duration (hours): _____
 Size of Disturbed Area at any time: _____

MONITORING RESULTS

Sample #	Parameter	Method	Results (units)	Laboratory (if applicable)
1	Turbidity			
2	Turbidity			
3	Turbidity			
4	Turbidity			

(provide an attachment if more than 4 samples were taken for this outfall)

Avg = _____

STATEMENT OF ACKNOWLEDGMENT

I certify that the data reported on this document were prepared under my direction or supervision in accordance with the General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. The information submitted is, to the best of my knowledge and belief, true, accurate and complete.

Authorized Official: _____
 Signature: _____ Date: _____

Please send completed form to:

DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
 BUREAU OF MATERIALS MANAGEMENT AND COMPLIANCE ASSURANCE
 79 ELM STREET
 HARTFORD, CT 06106-5127
 ATTN: NEAL WILLIAMS

Appendix C – Notice of Termination Form



General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

Notice of Termination Form

Please complete and submit this form in accordance with the general permit (DEP-PED-GP-015) in order to ensure the proper handling of your termination. Print or type unless otherwise noted.

Note: Ensure that for commercial and industrial facilities, registrations under the *General Permit for the Discharge of Stormwater Associated with Industrial Activity* (DEP-PED-GP-014) or the *General Permit for the Discharge of Stormwater from Commercial Activities* (DEP-PED-GP-004) have been filed where applicable. For questions about the applicability of these general permits, please call the Department at 860-424-3018.

Part I: Registrant Information

1. Permit number: **GSN**

2. Fill in the name of the registrant(s) as indicated on the registration certificate:
Registrant:

3. Site Address:
City/Town: _____ State: _____ Zip Code: _____

4. Date all storm drainage structures were cleaned of construction sediment:
Date of Completion of Construction: _____
Date of Last Inspection (must be at least three months after final stabilization pursuant to Section 6(b)(6)(D) of the general permit): _____

5. Check the post-construction activities at the site (check all that apply):
 Industrial Residential Commercial Capped Landfill
 Other (describe): _____

Part II: Certification

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those 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 made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the Connecticut General Statutes, pursuant to Section 53a-157b of the Connecticut General Statutes, and in accordance with any other applicable statute."

Signature of Permittee

Date

Name of Permittee (print or type)

Title (if applicable)

Note: Please submit this Notice of Termination Form to:

STORMWATER PERMIT COORDINATOR
BUREAU OF WATER MANAGEMENT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

Construction Contracts - Required Contract Provisions (FHWA Funded Contracts)

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- EXHIBIT F – Federal Wage Rates (Attached at the end)
- EXHIBIT G - State Wage Rates (Attached at the end)

1. Federal Highway Administration (FHWA) Form 1273

The Contractor shall comply with the Federal Highway Administration (FHWA), Form 1273 attached at Exhibit A, as revised, which is hereby made part of this contract. The Contractor shall also require its subcontractors to comply with the FHWA – Form 1273 and include the FHWA – Form 1273 as an attachment to all subcontracts and purchase orders.

2. Title VI of the Civil Rights Act of 1964 / Nondiscrimination Requirements

The Contractor shall comply with Title VI of the Civil Rights Act of 1964 as amended (42 U.S.C. 2000 et seq.), all requirements imposed by the regulations of the United States Department of Transportation (49 CFR Part 21) issued in implementation thereof, and the Title VI Contractor Assurances attached hereto at Exhibit B, all of which are hereby made a part of this Contract.

3. Contractor Work Force Utilization (Federal Executive Order 11246) / Equal Employment Opportunity

- (a) The Contractor shall comply with the Contractor Work Force Utilization (Federal Executive Order 11246) / Equal Employment Opportunity requirements attached at Exhibit C and hereby made part of this Contract, whenever a contractor or subcontractor at any tier performs construction work in excess of \$10,000. These goals shall be included in each contract and subcontract. Goal achievement is calculated for each trade using the hours worked under each trade.
- (b) Companies with contracts, agreements or purchase orders valued at \$10,000 or more will develop and implement an Affirmative Action Plan utilizing the ConnDOT Affirmative Action Plan Guideline. This Plan shall be designed to further the provision of equal employment opportunity to all persons without regard to their race, color, religion, sex or national origin, and to promote the full realization of equal employment opportunity through a positive continuation program. Plans shall be updated as required by ConnDOT.

4. Requirements of Title 49, Code of Federal Regulations (CFR), Part 26, Participation by DBEs, as may be revised.

Pursuant to 49 CFR 26.13, the following paragraph is part of this Contract and shall be included in each subcontract the Contractor enters into with a subcontractor:

“The Contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26, Participation by DBEs, in the award and administration of U.S. DOT-assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this Contract, which may result in the termination of this contract or such other remedy as ConnDOT (recipient) deems appropriate, which may include, but is not limited to: (1) Withholding monthly progress payments, (2) Assessing sanctions, (3) Liquidated damages; and/or, (4) Disqualifying the contractor from future bidding as non-responsible.”

5. Contract Wage Rates

The Contractor shall comply with:

The Federal and State wage rate requirements indicated in Exhibits F and G hereof, as revised, are hereby made part of this Contract. The Federal wage rates (Davis-Bacon Act) applicable to this Contract shall be the Federal wage rates that are current on the US Department of Labor website (<http://www.wdol.gov/dba.aspx>) as may be revised 10 days prior to bid opening. These applicable Federal wage rates will be physically incorporated in the final contract document executed by both parties. The Department will no longer physically include revised Federal wage rates in the bid documents or as part of addenda documents, prior to the bid opening date. During the bid advertisement period, bidders are responsible for obtaining the appropriate Federal wage rates from the US Department of Labor website.

To obtain the latest Federal wage rates go to the US Department of Labor website (link above). Under Davis-Bacon Act, choose "Selecting DBA WDs" and follow the instruction to search the latest wage rates for the State, County and Construction Type. Refer to the Notice to Contractor (NTC) - Federal Wage Determinations (Davis Bacon Act).

If a conflict exists between the Federal and State wage rates, the higher rate shall govern.

Prevailing Wages for Work on State Highways; Annual Adjustments. With respect to contracts for work on state highways and bridges on state highways, the Contractor shall comply with the provisions of Section 31-54 and 31-55a of the Connecticut General Statutes, as revised.

As required by Section 1.05.12 (Payrolls) of the State of Connecticut, Department of Transportation's Standard Specification for Roads, Bridges and Incidental Construction (FORM 816), as may be revised, every Contractor or subcontractor performing project work on a Federal aid project is required to post the relevant prevailing wage rates as determined by the United States Secretary of Labor. The wage rate determinations shall be posted in prominent and easily accessible places at the work site.

6. Americans with Disabilities Act of 1990, as Amended

This provision applies to those Contractors who are or will be responsible for compliance with the terms of the Americans with Disabilities Act of 1990, as amended (42 U.S.C. 12101 et seq.), (Act), during the term of the Contract. The Contractor represents that it is familiar with the terms of this Act and that it is in compliance with the Act. Failure of the Contractor to satisfy this standard as the same applies to performance under this Contract, either now or during the term of the Contract as it may be amended, will render the Contract voidable at the option of the State upon notice to the contractor. The Contractor warrants that it will hold the State harmless and indemnify the State from any liability which may be imposed upon the State as a result of any failure of the Contractor to be in compliance with this Act, as the same applies to performance under this Contract.

7. Connecticut Statutory Labor Requirements

(a) Construction, Alteration or Repair of Public Works Projects; Wage Rates. The Contractor shall comply with Section 31-53 of the Connecticut General Statutes, as revised. The wages paid on an hourly basis to any person performing the work of any mechanic, laborer or

worker on the work herein contracted to be done and the amount of payment or contribution paid or payable on behalf of each such person to any employee welfare fund, as defined in subsection (i) of section 31-53 of the Connecticut General Statutes, shall be at a rate equal to the rate customary or prevailing for the same work in the same trade or occupation in the town in which such public works project is being constructed. Any contractor who is not obligated by agreement to make payment or contribution on behalf of such persons to any such employee welfare fund shall pay to each mechanic, laborer or worker as part of such person's wages the amount of payment or contribution for such person's classification on each pay day.

(b) Debarment List. Limitation on Awarding Contracts. The Contractor shall comply with Section 31-53a of the Connecticut General Statutes, as revised.

(c) Construction Safety and Health Course. The Contractor shall comply with section 31-53b of the Connecticut General Statutes, as revised. The contractor shall furnish proof to the Labor Commissioner with the weekly certified payroll form for the first week each employee begins work on such project that any person performing the work of a mechanic, laborer or worker pursuant to the classifications of labor under section 31-53 of the Connecticut General Statutes, as revised, on such public works project, pursuant to such contract, has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, has completed a new miner training program approved by the Federal Mine Safety and Health Administration in accordance with 30 CFR 48 or, in the case of telecommunications employees, has completed at least ten hours of training in accordance with 29 CFR 1910.268.

Any employee required to complete a construction safety and health course as required that has not completed the course, shall have a maximum of fourteen (14) days to complete the course. If the employee has not been brought into compliance, they shall be removed from the project until such time as they have completed the required training.

Any costs associated with this notice shall be included in the general cost of the contract. In addition, there shall be no time granted to the contractor for compliance with this notice. The contractor's compliance with this notice and any associated regulations shall not be grounds for claims as outlined in Section 1.11 – "Claims".

(d) Awarding of Contracts to Occupational Safety and Health Law Violators Prohibited. The Contract is subject to Section 31-57b of the Connecticut General Statutes, as revised.

(e) Residents Preference in Work on Other Public Facilities. NOT APPLICABLE TO FEDERAL AID CONTRACTS. Pursuant to Section 31-52a of the Connecticut General Statutes, as revised, in the employment of mechanics, laborers or workmen to perform the work specified herein, preference shall be given to residents of the state who are, and continuously for at least six months prior to the date hereof have been, residents of this state, and if no such person is available, then to residents of other states

8. Tax Liability - Contractor's Exempt Purchase Certificate (CERT – 141)

The Contractor shall comply with Chapter 219 of the Connecticut General Statutes pertaining to tangible personal property or services rendered that is/are subject to sales tax. The Contractor is

responsible for determining its tax liability. If the Contractor purchases materials or supplies pursuant to the Connecticut Department of Revenue Services' "Contractor's Exempt Purchase Certificate (CERT-141)," as may be revised, the Contractor acknowledges and agrees that title to such materials and supplies installed or placed in the project will vest in the State simultaneously with passage of title from the retailers or vendors thereof, and the Contractor will have no property rights in the materials and supplies purchased.

Forms and instructions are available anytime by:

Internet: Visit the DRS website at www.ct.gov/DRS to download and print Connecticut tax forms; or
Telephone: Call 1-800-382-9463 (Connecticut calls outside the Greater Hartford calling area only) and select Option 2 or call 860-297-4753 (from anywhere).

9. Executive Orders

This contract is subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill, promulgated June 16, 1971, concerning labor employment practices, Executive Order No. Seventeen of Governor Thomas J. Meskill, promulgated February 15, 1973, concerning the listing of employment openings and Executive Order No. Sixteen of Governor John G. Rowland promulgated August 4, 1999, concerning violence in the workplace, all of which are incorporated into and are made a part of the contract as if they had been fully set forth in it. The contract may also be subject to Executive Order No. 14 of Governor M. Jodi Rell, promulgated April 17, 2006, concerning procurement of cleaning products and services and to Executive Order No. 49 of Governor Dannel P. Malloy, promulgated May 22, 2015, mandating disclosure of certain gifts to public employees and contributions to certain candidates for office. If Executive Order No. 14 and/or Executive Order No. 49 are applicable, they are deemed to be incorporated into and are made a part of the contract as if they had been fully set forth in it. At the Contractor's request, the Department shall provide a copy of these orders to the Contractor.

10. Non Discrimination Requirement (pursuant to section 4a-60 and 4a-60a of the Connecticut General Statutes, as revised): References to "minority business enterprises" in this Section are not applicable to Federal-aid projects/contracts. Federal-aid projects/contracts are instead subject to the Federal Disadvantaged Business Enterprise Program.

(a) For purposes of this Section, the following terms are defined as follows:

- (1) "Commission" means the Commission on Human Rights and Opportunities;
- (2) "Contract" and "contract" include any extension or modification of the Contract or contract;
- (3) "Contractor" and "contractor" include any successors or assigns of the Contractor or contractor;
- (4) "Gender identity or expression" means a person's gender-related identity, appearance or behavior, whether or not that gender-related identity, appearance or behavior is different from that traditionally associated with the person's physiology or assigned sex at birth, which gender-related identity can be shown by providing evidence including, but not limited to, medical history, care or treatment of the gender-related identity, consistent and uniform assertion of the gender-related identity or any other evidence that the gender-related identity is sincerely held, part of a person's core identity or not being asserted for an improper purpose.
- (5) "good faith" means that degree of diligence which a reasonable person would exercise in the performance of legal duties and obligations;
- (6) "good faith efforts" shall include, but not be limited to, those reasonable initial efforts necessary to comply with statutory or regulatory requirements and additional or substituted

efforts when it is determined that such initial efforts will not be sufficient to comply with such requirements;

- (7) "marital status" means being single, married as recognized by the state of Connecticut, widowed, separated or divorced;
- (8) "mental disability" means one or more mental disorders, as defined in the most recent edition of the American Psychiatric Association's "Diagnostic and Statistical Manual of Mental Disorders", or a record of or regarding a person as having one or more such disorders;
- (9) "minority business enterprise" means any small contractor or supplier of materials fifty-one percent or more of the capital stock, if any, or assets of which is owned by a person or persons: (1) who are active in the daily affairs of the enterprise, (2) who have the power to direct the management and policies of the enterprise, and (3) who are members of a minority, as such term is defined in subsection (a) of Connecticut General Statutes § 32-9n; and
- (10) "public works contract" means any agreement between any individual, firm or corporation and the State or any political subdivision of the State other than a municipality for construction, rehabilitation, conversion, extension, demolition or repair of a public building, highway or other changes or improvements in real property, or which is financed in whole or in part by the State, including, but not limited to, matching expenditures, grants, loans, insurance or guarantees.

For purposes of this Section, the terms "Contract" and "contract" do not include a contract where each contractor is (1) a political subdivision of the State of Connecticut, including, but not limited to municipalities, unless the contract is a municipal public works contract or quasi-public agency project contract, (2) any other state of the United States, including but not limited to, the District of Columbia, Puerto Rico, U.S. territories and possessions, and federally recognized Indian tribal governments, as defined in Connecticut General Statutes § 1-267, (3) the federal government, (4) a foreign government, or (5) an agency of a subdivision, state or government described in subdivision (1), (2), (3), or (4) of this subsection.

- (b) (1) The Contractor agrees and warrants that in the performance of the Contract such Contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, status as a veteran, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by such Contractor that such disability prevents performance of the work involved, in any manner prohibited by the laws of the United States or of the State of Connecticut; and the Contractor further agrees to take affirmative action to insure that applicants with job-related qualifications are employed and that employees are treated when employed without regard to their race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, status as a veteran, intellectual disability, mental disability or physical disability, including, but not limited to, blindness, unless it is shown by the Contractor that such disability prevents performance of the work involved; (2) the Contractor agrees, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, to state that it is an "affirmative action-equal opportunity employer" in accordance with regulations adopted by the Commission; (3) the Contractor agrees to provide each labor union or representative of workers with which the Contractor has a collective bargaining agreement or other contract or understanding and each vendor with which the Contractor has a contract or understanding, a notice to be provided by the Commission, advising the labor union or workers' representative of the Contractor's commitments under this section and to post copies of the notice in conspicuous places available to employees and applicants for employment; (4) the Contractor

agrees to comply with each provision of this Section and Connecticut General Statutes §§ 46a-68e and 46a-68f and with each regulation or relevant order issued by said Commission pursuant to Connecticut General Statutes §§ 46a-56, 46a-68e and 46a-68f; and (5) the Contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the Commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Contractor as relate to the provisions of this Section and Connecticut General Statutes § 46a-56. If the contract is a public works contract, the Contractor agrees and warrants that he will make good faith efforts to employ minority business enterprises as subcontractors and suppliers of materials on such public works projects.

- (c) Determination of the Contractor's good faith efforts shall include, but shall not be limited to, the following factors: The Contractor's employment and subcontracting policies, patterns and practices; affirmative advertising, recruitment and training; technical assistance activities and such other reasonable activities or efforts as the Commission may prescribe that are designed to ensure the participation of minority business enterprises in public works projects.
- (d) The Contractor shall develop and maintain adequate documentation, in a manner prescribed by the Commission, of its good faith efforts.
- (e) The Contractor shall include the provisions of subsection (b) of this Section in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the State and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by regulations or orders of the Commission. The Contractor shall take such action with respect to any such subcontract or purchase order as the Commission may direct as a means of enforcing such provisions including sanctions for noncompliance in accordance with Connecticut General Statutes §46a-56; provided if such Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Commission, the Contractor may request the State of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the State and the State may so enter.
- (f) The Contractor agrees to comply with the regulations referred to in this Section as they exist on the date of this Contract and as they may be adopted or amended from time to time during the term of this Contract and any amendments thereto.
- (g) (1) The Contractor agrees and warrants that in the performance of the Contract such Contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of sexual orientation, in any manner prohibited by the laws of the United States or the State of Connecticut, and that employees are treated when employed without regard to their sexual orientation; (2) the Contractor agrees to provide each labor union or representative of workers with which such Contractor has a collective bargaining agreement or other contract or understanding and each vendor with which such Contractor has a contract or understanding, a notice to be provided by the Commission on Human Rights and Opportunities advising the labor union or workers' representative of the Contractor's commitments under this section, and to post copies of the notice in conspicuous places available to employees and applicants for employment; (3) the Contractor agrees to comply with each provision of this section and with each regulation or relevant order issued by said Commission pursuant to Connecticut General Statutes § 46a-56; and (4) the Contractor agrees to provide the Commission on Human Rights and Opportunities with such information requested by the Commission, and permit access to pertinent books, records and accounts, concerning the employment practices and procedures of the Contractor which relate to the provisions of this Section and Connecticut General Statutes § 46a-56.
- (h) The Contractor shall include the provisions of the foregoing paragraph in every subcontract or purchase order entered into in order to fulfill any obligation of a contract with the State and such provisions shall be binding on a subcontractor, vendor or manufacturer unless exempted by

regulations or orders of the Commission. The Contractor shall take such action with respect to any such subcontract or purchase order as the Commission may direct as a means of enforcing such provisions including sanctions for noncompliance in accordance with Connecticut General Statutes § 46a-56; provided, if such Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the Commission, the Contractor may request the State of Connecticut to enter into any such litigation or negotiation prior thereto to protect the interests of the State and the State may so enter.

Please be aware the Nondiscrimination Certifications can be found at the Office of Policy and Management website:

<https://portal.ct.gov/OPM/Fin-PSA/Forms/Nondiscrimination-Certification>

11. Whistleblower Provision

The following clause is applicable if the Contract has a value of Five Million Dollars (\$5,000,000) or more.

Whistleblowing. This Contract may be subject to the provisions of Section 4-61dd of the Connecticut General Statutes. In accordance with this statute, if an officer, employee or appointing authority of the Contractor takes or threatens to take any personnel action against any employee of the Contractor in retaliation for such employee's disclosure of information to any employee of the contracting state or quasi-public agency or the Auditors of Public Accounts or the Attorney General under the provisions of subsection (a) of such statute, the Contractor shall be liable for a civil penalty of not more than five thousand dollars for each offense, up to a maximum of twenty per cent of the value of this Contract. Each violation shall be a separate and distinct offense and in the case of a continuing violation, each calendar day's continuance of the violation shall be deemed to be a separate and distinct offense. The State may request that the Attorney General bring a civil action in the Superior Court for the Judicial District of Hartford to seek imposition and recovery of such civil penalty. In accordance with subsection (f) of such statute, each large state contractor, as defined in the statute, shall post a notice of the provisions of the statute relating to large state contractors in a conspicuous place which is readily available for viewing by the employees of the Contractor.

12. Connecticut Freedom of Information Act

- (a) **Disclosure of Records.** This Contract may be subject to the provisions of section 1-218 of the Connecticut General Statutes. In accordance with this statute, each contract in excess of two million five hundred thousand dollars between a public agency and a person for the performance of a governmental function shall (a) provide that the public agency is entitled to receive a copy of records and files related to the performance of the governmental function, and (b) indicate that such records and files are subject to FOIA and may be disclosed by the public agency pursuant to FOIA. No request to inspect or copy such records or files shall be valid unless the request is made to the public agency in accordance with FOIA. Any complaint by a person who is denied the right to inspect or copy such records or files shall be brought to the Freedom of Information Commission in accordance with the provisions of sections 1-205 and 1-206 of the Connecticut General Statutes.
- (b) **Confidential Information.** The State will afford due regard to the Contractor's request for the protection of proprietary or confidential information which the State receives from the Contractor. However, all materials associated with the Contract are subject to the terms of the FOIA and all corresponding rules, regulations and interpretations. In making such a request, the Contractor may not merely state generally that the materials are proprietary or confidential in nature and not, therefore, subject to release to third parties. Those particular

sentences, paragraphs, pages or sections that the Contractor believes are exempt from disclosure under the FOIA must be specifically identified as such. Convincing explanation and rationale sufficient to justify each exemption consistent with the FOIA must accompany the request. The rationale and explanation must be stated in terms of the prospective harm to the competitive position of the Contractor that would result if the identified material were to be released and the reasons why the materials are legally exempt from release pursuant to the FOIA. To the extent that any other provision or part of the Contract conflicts or is in any way inconsistent with this section, this section controls and shall apply and the conflicting provision or part shall not be given effect. If the Contractor indicates that certain documentation is submitted in confidence, by specifically and clearly marking the documentation as "CONFIDENTIAL," DOT will first review the Contractor's claim for consistency with the FOIA (that is, review that the documentation is actually a trade secret or commercial or financial information and not required by statute), and if determined to be consistent, will endeavor to keep such information confidential to the extent permitted by law. See, *e.g.*, Conn. Gen. Stat. §1-210(b)(5)(A-B). The State, however, has no obligation to initiate, prosecute or defend any legal proceeding or to seek a protective order or other similar relief to prevent disclosure of any information that is sought pursuant to a FOIA request. Should the State withhold such documentation from a Freedom of Information requester and a complaint be brought to the Freedom of Information Commission, the Contractor shall have the burden of cooperating with DOT in defense of that action and in terms of establishing the availability of any FOIA exemption in any proceeding where it is an issue. In no event shall the State have any liability for the disclosure of any documents or information in its possession which the State believes are required to be disclosed pursuant to the FOIA or other law.

13. Service of Process

The Contractor, if not a resident of the State of Connecticut, or, in the case of a partnership, the partners, if not residents, hereby appoints the Secretary of State of the State of Connecticut, and his successors in office, as agent for service of process for any action arising out of or as a result of this Contract; such appointment to be in effect throughout the life of this Contract and six (6) years thereafter.

14. Substitution of Securities for Retainages on State Contracts and Subcontracts

This Contract is subject to the provisions of Section 3-112a of the General Statutes of the State of Connecticut, as revised.

15. Health Insurance Portability and Accountability Act of 1996 (HIPAA)

The Contractor shall comply, if applicable, with the Health Insurance Portability and Accountability Act of 1996 and, pursuant thereto, the provisions attached at Exhibit D, and hereby made part of this Contract.

16. Forum and Choice of Law

Forum and Choice of Law. The parties deem the Contract to have been made in the City of Hartford, State of Connecticut. Both parties agree that it is fair and reasonable for the validity and construction of the Contract to be, and it shall be, governed by the laws and court decisions of the State of

Connecticut, without giving effect to its principles of conflicts of laws. To the extent that any immunities provided by Federal law or the laws of the State of Connecticut do not bar an action against the State, and to the extent that these courts are courts of competent jurisdiction, for the purpose of venue, the complaint shall be made returnable to the Judicial District of Hartford only or shall be brought in the United States District Court for the District of Connecticut only, and shall not be transferred to any other court, provided, however, that nothing here constitutes a waiver or compromise of the sovereign immunity of the State of Connecticut. The Contractor waives any objection which it may now have or will have to the laying of venue of any Claims in any forum and further irrevocably submits to such jurisdiction in any suit, action or proceeding.

17. Summary of State Ethics Laws

Pursuant to the requirements of section 1-101qq of the Connecticut General Statutes, the summary of State ethics laws developed by the State Ethics Commission pursuant to section 1-81b of the Connecticut General Statutes is incorporated by reference into and made a part of the Contract as if the summary had been fully set forth in the Contract.

18. Audit and Inspection of Plants, Places of Business and Records

- (a) The State and its agents, including, but not limited to, the Connecticut Auditors of Public Accounts, Attorney General and State's Attorney and their respective agents, may, at reasonable hours, inspect and examine all of the parts of the Contractor's and Contractor Parties' plants and places of business which, in any way, are related to, or involved in, the performance of this Contract. For the purposes of this Section, "Contractor Parties" means the Contractor's members, directors, officers, shareholders, partners, managers, principal officers, representatives, agents, servants, consultants, employees or any one of them or any other person or entity with whom the Contractor is in privity of oral or written contract and the Contractor intends for such other person or entity to Perform under the Contract in any capacity.
- (b) The Contractor shall maintain, and shall require each of the Contractor Parties to maintain, accurate and complete Records. The Contractor shall make all of its and the Contractor Parties' Records available at all reasonable hours for audit and inspection by the State and its agents.
- (c) The State shall make all requests for any audit or inspection in writing and shall provide the Contractor with at least twenty-four (24) hours' notice prior to the requested audit and inspection date. If the State suspects fraud or other abuse, or in the event of an emergency, the State is not obligated to provide any prior notice.
- (d) The Contractor shall keep and preserve or cause to be kept and preserved all of its and Contractor Parties' Records until three (3) years after the latter of (i) final payment under this Agreement, or (ii) the expiration or earlier termination of this Agreement, as the same may be modified for any reason. The State may request an audit or inspection at any time during this period. If any Claim or audit is started before the expiration of this period, the Contractor shall retain or cause to be retained all Records until all Claims or audit findings have been resolved.
- (e) The Contractor shall cooperate fully with the State and its agents in connection with an audit or inspection. Following any audit or inspection, the State may conduct and the Contractor shall cooperate with an exit conference.
- (f) The Contractor shall incorporate this entire Section verbatim into any contract or other agreement that it enters into with any Contractor Party.

19. Campaign Contribution Restriction

For all State contracts, defined in Conn. Gen. Stat. §9-612(f)(1) as having a value in a calendar year of \$50,000 or more, or a combination or series of such agreements or contracts having a value of \$100,000 or more, the authorized signatory to this contract expressly acknowledges receipt of the State

Elections Enforcement Commission’s notice advising state contractors of state campaign contribution and solicitation prohibitions, and will inform its principals of the contents of the notice, as set forth in "Notice to Executive Branch State Contractors and Prospective State Contractors of Campaign Contribution and Solicitation Limitations," a copy of which is attached hereto and hereby made a part of this contract, attached as Exhibit E.

20. Tangible Personal Property

- (a) The Contractor on its behalf and on behalf of its Affiliates, as defined below, shall comply with the provisions of Conn. Gen. Stat. §12-411b, as follows:
 - (1) For the term of the Contract, the Contractor and its Affiliates shall collect and remit to the State of Connecticut, Department of Revenue Services, any Connecticut use tax due under the provisions of Chapter 219 of the Connecticut General Statutes for items of tangible personal property sold by the Contractor or by any of its Affiliates in the same manner as if the Contractor and such Affiliates were engaged in the business of selling tangible personal property for use in Connecticut and had sufficient nexus under the provisions of Chapter 219 to be required to collect Connecticut use tax;
 - (2) A customer’s payment of a use tax to the Contractor or its Affiliates relieves the customer of liability for the use tax;
 - (3) The Contractor and its Affiliates shall remit all use taxes they collect from customers on or before the due date specified in the Contract, which may not be later than the last day of the month next succeeding the end of a calendar quarter or other tax collection period during which the tax was collected;
 - (4) The Contractor and its Affiliates are not liable for use tax billed by them but not paid to them by a customer; and
 - (5) Any Contractor or Affiliate who fails to remit use taxes collected on behalf of its customers by the due date specified in the Contract shall be subject to the interest and penalties provided for persons required to collect sales tax under chapter 219 of the general statutes.
- (b) For purposes of this section of the Contract, the word “Affiliate” means any person, as defined in section 12-1 of the general statutes, that controls, is controlled by, or is under common control with another person. A person controls another person if the person owns, directly or indirectly, more than ten per cent of the voting securities of the other person. The word “voting security” means a security that confers upon the holder the right to vote for the election of members of the board of directors or similar governing body of the business, or that is convertible into, or entitles the holder to receive, upon its exercise, a security that confers such a right to vote. “Voting security” includes a general partnership interest.
- (c) The Contractor represents and warrants that each of its Affiliates has vested in the Contractor plenary authority to so bind the Affiliates in any agreement with the State of Connecticut. The Contractor on its own behalf and on behalf of its Affiliates shall also provide, no later than 30 days after receiving a request by the State’s contracting authority, such information as the State may require to ensure, in the State’s sole determination, compliance with the provisions of Chapter 219 of the Connecticut General Statutes, including, but not limited to, §12-411b.

21. Bid Rigging and/or Fraud – Notice to Contractor

The Connecticut Department of Transportation is cooperating with the U.S. Department of Transportation and the Justice Department in their investigation into highway construction contract bid rigging and/or fraud.

A toll-free “HOT LINE” telephone number 800-424-9071 has been established to receive information from contractors, subcontractors, manufacturers, suppliers or anyone with knowledge of bid rigging and/or fraud, either past or current. The “HOT LINE” telephone number will be available during

normal working hours (8:00 am – 5:00 pm EST). Information will be treated confidentially and anonymity respected.

22. Consulting Agreement Affidavit

The Contractor shall comply with Connecticut General Statutes Section 4a-81(a) and 4a-81(b), as revised. Pursuant to Public Act 11-229, after the initial submission of the form, if there is a change in the information contained in the form, a contractor shall submit the updated form, as applicable, either (i) not later than thirty (30) days after the effective date of such change or (ii) prior to execution of any new contract, whichever is earlier.

The Affidavit/Form may be submitted in written format or electronic format through the Department of Administrative Services (DAS) website.

23. Cargo Preference Act Requirements (46 CFR 381.7(a)-(b)) – Use of United States Flag Vessels

The Contractor agrees to comply with the following:

(a) Agreement Clauses.

- (1) Pursuant to Pub. L. 664 ([43 U.S.C. 1241\(b\)](#)) at least 50 percent of any equipment, materials or commodities procured, contracted for or otherwise obtained with funds granted, guaranteed, loaned, or advanced by the U.S. Government under this agreement, and which may be transported by ocean vessel, shall be transported on privately owned United States-flag commercial vessels, if available.
- (2) Within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (a)(1) of this section shall be furnished to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.

(b) Contractor and Subcontractor Clauses. The contractor agrees—

- (1) To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels.
- (2) To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, ‘on-board’ commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b) (1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Division of National Cargo, Office of Market Development, Maritime Administration, Washington, DC 20590.
- (3) To insert the substance of the provisions of this clause in all subcontracts issued pursuant to this contract.

EXHIBIT A

FHWA-1273 -- Revised May 1, 2012

REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS

- I. General
- II. Nondiscrimination
- III. Nonsegregated Facilities
- IV. Davis-Bacon and Related Act Provisions
- V. Contract Work Hours and Safety Standards Act Provisions
- VI. Subletting or Assigning the Contract
- VII. Safety: Accident Prevention
- VIII. False Statements Concerning Highway Projects
- IX. Implementation of Clean Air Act and Federal Water Pollution Control Act
- X. Compliance with Governmentwide Suspension and Debarment Requirements
- XI. Certification Regarding Use of Contract Funds for Lobbying

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under Title 23 (excluding emergency contracts solely intended for debris removal). The contractor (or subcontractor) must insert this form in each subcontract and further require its inclusion in all lower tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services).

The applicable requirements of Form FHWA-1273 are incorporated by reference for work done under any purchase order, rental agreement or agreement for other services. The prime contractor shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Form FHWA-1273 must be included in all Federal-aid design-build contracts, in all subcontracts and in lower tier subcontracts (excluding subcontracts for design services, purchase orders, rental agreements and other agreements for supplies or services). The design-builder shall be responsible for compliance by any subcontractor, lower-tier subcontractor or service provider.

Contracting agencies may reference Form FHWA-1273 in bid proposal or request for proposal documents, however, the Form FHWA-1273 must be physically incorporated (not referenced) in all contracts, subcontracts and lower-tier subcontracts (excluding purchase orders, rental agreements and other agreements for supplies or services related to a construction contract).

2. Subject to the applicability criteria noted in the following sections, these contract provisions shall apply to all work performed on the contract by the contractor's own organization and with the assistance of workers under the contractor's immediate superintendence and to all work performed on the contract by piecework, station work, or by subcontract.

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors.

II. NONDISCRIMINATION

The provisions of this section related to 23 CFR Part 230 are applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more. The provisions of 23 CFR Part 230 are not applicable to material supply, engineering, or architectural service contracts.

In addition, the contractor and all subcontractors must comply with the following policies: Executive Order 11246, 41 CFR 60, 29 CFR 1625-1627, Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The contractor and all subcontractors must comply with: the requirements of the Equal Opportunity Clause in 41 CFR 60-1.4(b) and, for all construction contracts exceeding \$10,000, the Standard Federal Equal Employment Opportunity Construction Contract Specifications in 41 CFR 60-4.3.

Note: The U.S. Department of Labor has exclusive authority to determine compliance with Executive Order 11246 and the policies of the Secretary of Labor including 41 CFR 60, and 29 CFR 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with Title 23 USC Section 140, the Rehabilitation Act of 1973, as amended (29 USC 794), and Title VI of the Civil Rights Act of 1964, as amended, and related regulations including 49 CFR Parts 21, 26 and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR 230, Appendix A, with appropriate revisions to conform to the U.S. Department of Labor (US DOL) and FHWA requirements.

1. Equal Employment Opportunity: Equal employment opportunity (EEO) requirements not to discriminate and to take affirmative action to assure equal opportunity as set forth under laws, executive orders, rules, regulations (28 CFR 35, 29 CFR 1630, 29 CFR 1625-1627, 41 CFR 60 and 49 CFR 27) and orders of the Secretary of Labor as modified by the provisions prescribed herein, and imposed pursuant to 23 U.S.C. 140 shall constitute the EEO and specific affirmative action standards for the contractor's project activities under this contract. The provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 et seq.) set forth under 28 CFR 35 and 29 CFR 1630 are incorporated by reference in this contract. In the execution of this contract, the contractor agrees to comply with the following minimum specific requirement activities of EEO:

a. The contractor will work with the contracting agency and the Federal Government to ensure that it has made every good faith effort to provide equal opportunity with respect to all of its terms and conditions of employment and in their review of activities under the contract.

b. The contractor will accept as its operating policy the following statement:

"It is the policy of this Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color, national origin, age or disability. Such action shall include: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and/or on-the-job training."

2. EEO Officer: The contractor will designate and make known to the contracting officers an EEO Officer who will have the responsibility for and must be capable of effectively administering and promoting an active EEO program and who must be assigned adequate authority and responsibility to do so.

3. Dissemination of Policy: All members of the contractor's staff who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, the contractor's EEO policy and contractual responsibilities to provide EEO in each grade and classification of employment. To ensure that the above agreement will be met, the following actions will be taken as a minimum:

a. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the contractor's EEO policy and its implementation will be reviewed and explained. The meetings will be conducted by the EEO Officer.

b. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.

c. All personnel who are engaged in direct recruitment for the project will be instructed by the EEO Officer in the contractor's procedures for locating and hiring minorities and women.

d. Notices and posters setting forth the contractor's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.

e. The contractor's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.

4. Recruitment: When advertising for employees, the contractor will include in all advertisements for employees the notation: "An Equal Opportunity Employer." All such advertisements will be placed in publications having a large circulation among minorities and women in the area from which the project work force would normally be derived.

a. The contractor will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minorities and women. To meet this requirement, the contractor will identify sources of potential minority group employees, and establish with such identified sources procedures whereby minority and women applicants may be referred to the contractor for employment consideration.

b. In the event the contractor has a valid bargaining agreement providing for exclusive hiring hall referrals, the contractor is expected to observe the provisions of that agreement to the extent that the system meets the contractor's compliance with EEO contract provisions. Where implementation of such an agreement has the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Federal nondiscrimination provisions.

c. The contractor will encourage its present employees to refer minorities and women as applicants for employment. Information and procedures with regard to referring such applicants will be discussed with employees.

5. Personnel Actions: Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to race, color, religion, sex, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of project site personnel.

b. The contractor will periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.

c. The contractor will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take corrective action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.

d. The contractor will promptly investigate all complaints of alleged discrimination made to the contractor in connection with its obligations under this contract, will attempt to resolve such complaints, and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective action shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of their avenues of appeal.

6. Training and Promotion:

a. The contractor will assist in locating, qualifying, and increasing the skills of minorities and women who are applicants for employment or current employees. Such efforts should be aimed at developing full journey level status employees in the type of trade or job classification involved.

b. Consistent with the contractor's work force requirements and as permissible under Federal and State regulations, the contractor shall make full use of training programs, i.e., apprenticeship, and on-the-job training programs for the geographical area of contract performance. In the event a special provision for training is provided under this contract, this subparagraph will be superseded as indicated in the special provision. The contracting agency may reserve training positions for persons who receive welfare assistance in accordance with 23 U.S.C. 140(a).

c. The contractor will advise employees and applicants for employment of available training programs and entrance requirements for each.

d. The contractor will periodically review the training and promotion potential of employees who are minorities and women and will encourage eligible employees to apply for such training and promotion.

7. Unions: If the contractor relies in whole or in part upon unions as a source of employees, the contractor will use good faith efforts to obtain the cooperation of such unions to increase opportunities for minorities and women. Actions by the contractor, either directly or through a contractor's association acting as agent, will include the procedures set forth below:

a. The contractor will use good faith efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minorities and women for membership in the unions and increasing the skills of minorities and women so that they may qualify for higher paying employment.

b. The contractor will use good faith efforts to incorporate an EEO clause into each union agreement to the end that such union will be contractually bound to refer applicants without regard to their race, color, religion, sex, national origin, age or disability.

c. The contractor is to obtain information as to the referral practices and policies of the labor union except that to the extent such information is within the exclusive possession of the labor union and such labor union refuses to furnish such information to the contractor, the contractor shall so certify to the contracting agency and shall set forth what efforts have been made to obtain such information.

d. In the event the union is unable to provide the contractor with a reasonable flow of referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies without regard to race, color, religion, sex, national origin, age or disability; making full efforts to obtain qualified and/or qualifiable minorities and women. The failure of a union to provide sufficient referrals (even though it is obligated to provide exclusive referrals under the terms of a collective bargaining agreement) does not relieve the contractor from the requirements of this paragraph. In the event the union referral practice prevents the contractor from meeting the obligations pursuant to Executive Order 11246, as amended, and these special provisions, such contractor shall immediately notify the contracting agency.

8. Reasonable Accommodation for Applicants / Employees with Disabilities: The contractor must be familiar with the requirements for and comply with the Americans with Disabilities Act and all rules and regulations established there under. Employers must provide reasonable accommodation in all employment activities unless to do so would cause an undue hardship.

9. Selection of Subcontractors, Procurement of Materials and Leasing of Equipment: The contractor shall not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The contractor shall take all necessary and reasonable steps to ensure nondiscrimination in the administration of this contract.

a. The contractor shall notify all potential subcontractors and suppliers and lessors of their EEO obligations under this contract.

b. The contractor will use good faith efforts to ensure subcontractor compliance with their EEO obligations.

10. Assurance Required by 49 CFR 26.13(b):

a. The requirements of 49 CFR Part 26, and the State DOT's U.S. DOT-approved DBE program are incorporated by reference.

b. The contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26, in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the contracting agency deems appropriate.

11. Records and Reports: The contractor shall keep such records as necessary to document compliance with the EEO requirements. Such records shall be retained for a period of three years following the date of the final payment to the contractor for all contract work and shall be available at reasonable times and places for inspection by authorized representatives of the contracting agency and the FHWA.

a. The records kept by the contractor shall document the following:

(1) The number and work hours of minority and non-minority group members and women employed in each work classification on the project;

(2) The progress and efforts being made in cooperation with unions, when applicable, to increase employment opportunities for minorities and women; and

(3) The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minorities and women;

b. The contractors and subcontractors will submit an annual report to the contracting agency each July for the duration of the project, indicating the number of minority, women, and non-minority group employees currently engaged in each work classification required by the contract work. This information is to be reported on [Form FHWA-1391](#). The staffing data should represent the project work force on board in all or any part of the last payroll period preceding the end of July. If on-the-job training is being required by special provision, the contractor will be required to collect and report training data. The employment data should reflect the work force on board during all or any part of the last payroll period preceding the end of July.

III. NONSEGREGATED FACILITIES

This provision is applicable to all Federal-aid construction contracts and to all related construction subcontracts of \$10,000 or more.

The contractor must ensure that facilities provided for employees are provided in such a manner that segregation on the basis of race, color, religion, sex, or national origin cannot result. The contractor may neither require such segregated use by written or oral policies nor tolerate such use by employee custom. The contractor's obligation extends further to ensure that its employees are not assigned to perform their services at any location, under the contractor's control, where the facilities are segregated. The term "facilities" includes waiting rooms, work areas, restaurants and other eating areas, time clocks, restrooms, washrooms, locker rooms, and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing provided for

employees. The contractor shall provide separate or single-user restrooms and necessary dressing or sleeping areas to assure privacy between sexes.

IV. DAVIS-BACON AND RELATED ACT PROVISIONS

This section is applicable to all Federal-aid construction projects exceeding \$2,000 and to all related subcontracts and lower-tier subcontracts (regardless of subcontract size). The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. Contracting agencies may elect to apply these requirements to other projects.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 “Contract provisions and related matters” with minor revisions to conform to the FHWA-1273 format and FHWA program requirements.

1. Minimum wages

a. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph 1.d. of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph 1.b. of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

b. (1) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(i) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(ii) The classification is utilized in the area by the construction industry; and

(iii) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(2) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(3) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Wage and Hour Administrator for determination. The Wage and Hour Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(4) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs 1.b.(2) or 1.b.(3) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

c. Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

d. If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract, or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same

prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the contracting agency may, after written notice to the contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

a. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

b. (1) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the contracting agency. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. , the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/esa/whd/forms/wh347instr.htm> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the contracting agency for transmission to the State DOT, the FHWA or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the contracting agency..

(2) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(i) That the payroll for the payroll period contains the information required to be provided under §5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under §5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(ii) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(iii) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(3) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the “Statement of Compliance” required by paragraph 3.b.(2) of this section.

(4) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

c. The contractor or subcontractor shall make the records required under paragraph 3.a. of this section available for inspection, copying, or transcription by authorized representatives of the contracting agency, the State DOT, the FHWA, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the FHWA may, after written notice to the contractor, the contracting agency or the State DOT, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and trainees

a. Apprentices (programs of the USDOL).

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise

employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed.

Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination.

In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

b. Trainees (programs of the USDOL).

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration.

The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration.

Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed.

In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

c. Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

d. Apprentices and Trainees (programs of the U.S. DOT).

Apprentices and trainees working under apprenticeship and skill training programs which have been certified by the Secretary of Transportation as promoting EEO in connection with Federal-aid highway construction programs are not subject to the requirements of paragraph 4 of this Section IV. The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to journeymen shall not be greater than permitted by the terms of the particular program.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

6. Subcontracts. The contractor or subcontractor shall insert Form FHWA-1273 in any subcontracts and also require the subcontractors to include Form FHWA-1273 in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

7. Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility.

a. By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

b. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

c. The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

V. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT

The following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1.) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1.) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1.) of this section.

3. Withholding for unpaid wages and liquidated damages. The FHWA or the contracting agency shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2.) of this section.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1.) through (4.) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1.) through (4.) of this section.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be

performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term “perform work with its own organization” refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions:

- (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
- (2) the prime contractor remains responsible for the quality of the work of the leased employees;
- (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
- (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract.

2. The contract amount upon which the requirements set forth in paragraph (1) of Section VI is computed includes the cost of material and manufactured products which are to be purchased or produced by the contractor under the contract provisions.

3. The contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract.

5. The 30% self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements.

VII. SAFETY: ACCIDENT PREVENTION

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

1. In the performance of this contract the contractor shall comply with all applicable Federal, State, and local laws governing safety, health, and sanitation (23 CFR 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract.
2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).
3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C.3704).

VIII. FALSE STATEMENTS CONCERNING HIGHWAY PROJECTS

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

In order to assure high quality and durable construction in conformity with approved plans and specifications and a high degree of reliability on statements and representations made by engineers, contractors, suppliers, and workers on Federal-aid highway projects, it is essential that all persons concerned with the project perform their functions as carefully, thoroughly, and honestly as possible. Willful falsification, distortion, or misrepresentation with respect to any facts related to the project is a violation of Federal law. To prevent any misunderstanding regarding the seriousness of these and similar acts, Form FHWA-1022 shall be posted on each Federal-aid highway project (23 CFR 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 1, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts.

By submission of this bid/proposal or the execution of this contract, or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, or subcontractor, as appropriate, will be deemed to have stipulated as follows:

1. That any person who is or will be utilized in the performance of this contract is not prohibited from receiving an award due to a violation of Section 508 of the Clean Water Act or Section 306 of the Clean Air Act.
2. That the contractor agrees to include or cause to be included the requirements of paragraph (1) of this Section X in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements.

X. CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, consultant contracts or any other covered transaction requiring FHWA approval or that is estimated to cost \$25,000 or more – as defined in 2 CFR Parts 180 and 1200.

1. Instructions for Certification – First Tier Participants:

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and 1200. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers to any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default.

* * * * *

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency;

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

2. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200)

a. By signing and submitting this proposal, the prospective lower tier is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180 and

1200. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a grantee or subgrantee of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a grantee or subgrantee of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the Excluded Parties List System website (<https://www.epls.gov/>), which is compiled by the General Services Administration.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

* * * * *

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion--Lower Tier Participants:

1. The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency.

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

* * * * *

XI. CERTIFICATION REGARDING USE OF CONTRACT FUNDS FOR LOBBYING

This provision is applicable to all Federal-aid construction contracts and to all related subcontracts which exceed \$100,000 (49 CFR 20).

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

EXHIBIT B

**TITLE VI CONTRACTOR ASSURANCES
APPENDIX A**

During the performance of this contract, the contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. **Compliance with Regulations:** The contractor (hereinafter includes consultants) will comply with the Regulations relative to Nondiscrimination in Federally-assisted programs of the United States Department of Transportation Federal Highway Administration and Federal Transit Administration, as they may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

2. **Nondiscrimination:** The contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, national origin, sex, age, disability, income or Limited English Proficiency in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by bidding, or negotiation made by the contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the contractor of the contractor's obligations under this contract and Acts and the Regulations relative to Non-discrimination on the grounds of race, color, or national origin.

4. **Information and Reports:** The contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the Federal Highway Administration or Federal Transit Administration to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor will so certify to the Recipient or the Federal Highway Administration or the Federal Transit Administration, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Non-compliance:** In the event of the contractor's non-compliance with the Non-discrimination provisions of this contract, the Recipient will impose such contract sanctions as it or the Federal Highway Administration or the Federal Transit Administration may determine to be appropriate, including, but not limited to:

- a. withholding contract payments to the contractor under the contract until the contractor complies; and/or
- b. cancelling, terminating, or suspending a contract, in whole or in part.

6. **Incorporation of Provisions:** The contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations and directives issued pursuant thereto. The contractor will take action with respect to any subcontract or procurement as the Recipient or the Federal Highway Administration or the Federal Transit Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the contractor becomes involved in, or is threatened with, litigation by a subcontractor, or supplier because of such direction, the contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the contractor may request the United States to enter into the litigation to protect the interests of the United States.

TITLE VI CONTRACTOR ASSURANCES APPENDIX E

During the performance of this contract, the contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "contractor") agrees to comply with the following nondiscrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. § 2000d et seq.), (prohibits discrimination on the basis of race, color, national origin), as implemented by 49 C.F.R. § 21.1 et seq. and 49 C.F.R. part 303;
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601) (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Federal-Aid Highway Act of 1973 (23 U.S.C. § 324 et seq.) (prohibits discrimination on the basis of sex);
- Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. § 794 et seq.) (prohibits discrimination on the basis of disability); and 49 C.F.R. part 27;
- The Age Discrimination Act of 1975, as amended (42 U.S.C. § 6101 et seq.) (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982 (Pub. L. 97-248 (1982)), as amended (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987 (102 Stat. 28) ("*... which restore[d] the broad scope of coverage and to clarify the application of Title IX of the Education Amendments of 1972, section 504 of the Rehabilitation Act of 1973, the Age Discrimination Act of 1975, and Title VI of the Civil Rights Act of 1964.*");
- Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131 --12189), as implemented by Department of Justice regulations at 28 C.F.R. parts 35 and 36, and Department of Transportation regulations at 49 C.F.R. parts 37 and 38;
- The Federal Aviation Administration's Non-discrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures non-discrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;

- Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- Title of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. § 1681 et seq).

EXHIBIT C

CONTRACTOR WORKFORCE UTILIZATION (FEDERAL EXECUTIVE ORDER 11246) / EQUAL EMPLOYMENT OPPORTUNITY (Federal - FHWA)

1. Project Workforce Utilization Goals:

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or Federally assisted or funded) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for the geographical area where the work is actually performed.

Whenever the Contractor, or any Subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications which contain the applicable goals for minority and female participation.

The goals for minority and female utilization are expressed in percentage terms for the contractor's aggregate work-force in each trade on all construction work in the covered area, are referenced in the attached Appendix A.

2. Executive Order 11246

The Contractor's compliance with Executive Order 11246 and 41-CFR Part 60-4 shall be based on its implementation of the specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(A) and its efforts to meet the goals established for the geographical area where the contract is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from contractor to contractor or from project to project for the sole purpose of meeting the contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hour performed.

If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan.

Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or subcontractors toward a goal in an approved Pan does not excuse any covered Contractor's of subcontractor's failure to take good faith efforts to achieve the plan goals and timetables.

The Contractor shall implement the specific affirmative action standards provided in a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered Construction contractors performing construction work in geographical areas where they do not have a federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form and such notices may be obtained from any Office of Federal Contract Compliance Programs (OFCCP) Office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractors obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant hereto.

In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:

- a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites; and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
- b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community

organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.

- c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off the street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason thereafter; along with whatever additional actions the Contractor may have taken.
- d. Provide immediate written notification to the Director when the Union or Unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or women sent by the Contractor, or when the Contractor has other information that the Union referral process has impeded the Contractor's efforts to meet its obligations.
- e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under b above.
- f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO Policy on bulletin boards accessible to all employees at each location where construction work is performed.
- g. Review, at least annually, the company EEO Policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment, decisions including specific Foreman, etc. prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
- h. Disseminate the Contractor's EEO Policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and subcontractors with whom the Contractor does or anticipates doing business.
- i. Direct its recruitment efforts, both oral and written, to minority female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the contractor

shall send written notification to organizations such as the above, describing the openings, screening procedures and tests to be used in the selection process.

- j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's work-force.
- k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
- l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
- m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
- n. Ensure that all facilities and company activities are non-segregated except that separate or single user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
- o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
- p. Conduct a review at least annually of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (a through p). The efforts of a contractor association, joint contractor union, contractor community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under a through p of these specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female work-force participation, makes a good faith effort to meet with individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of Executive Order 11246 if a particular group is employed in a substantially disparate manner, (for example, even though the

Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is under utilized).

The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status, (e.g. mechanic, apprentice, trainee, helper, or laborer) dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

Nothing herein provided shall be construed as a limitation upon the application of their laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g. those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

The Director of the Office of Federal Contract Compliance Programs, from time to time, shall issue goals and timetables for minority and female utilization which shall be based on appropriate work-force, demographic or other relevant data and which shall cover construction projects or construction contracts performed in specific geographical areas. The goals, which shall be applicable to each construction trade in a covered contractor's or timetables, shall be published as notices in the Federal Register, and shall be inserted by the Contracting officers and applicants, as applicable, in the Notice required by 41 CFR 60-4.2.

FEDERALLY FUNDED OR ASSISTED PROJECTS
APPENDIX A
(Labor Market Goals)

Standard Metropolitan Statistical Area (SMSA)

Female

Minority

Bridgeport – Stamford – Norwalk – Danbury	10.2%
6.9%	

Bethel	Bridgeport	Brookfield	Danbury
Darien	Derby	Easton	Fairfield
Greenwich	Milford	Monroe	New Canaan
New Fairfield	Newton	Norwalk	Redding
Shelton	Stamford	Stratford	Trumbull
Weston	Westport	Wilton	

Hartford – Bristol – New Britain	6.9%
6.9%	

Andover	Avon	Berlin	Bloomfield
Bolton	Bristol	Burlington	Canton
Colchester	Columbia	Coventry	Cromwell
East Granby	East Hampton	East Hartford	East Windsor
Ellington	Enfield	Farmington	Glastonbury
Granby	Hartford	Hebron	Manchester
Marlborough	New Britain	New Hartford	Newington
Plainville	Plymouth	Portland	Rocky Hill
Simsbury	South Windsor	Southington	Stafford
Suffield	Tolland	Vernon	West Hartford
Wethersfield	Willington	Windsor	Windsor Locks

New Haven – Waterbury – Meriden	9.0%
6.9%	

Beacon Falls	Bethany	Branford	Cheshire
Clinton	East Haven	Guilford	Hamden
Madison	Meriden	Middlebury	Naugatuck
New Haven	North Branford	North Haven	Orange
Prospect	Southbury	Thomaston	Wallingford
Waterbury	Watertown	West Haven	Wolcott
Woodbridge	Woodbury		

New London – Norwich	4.5%
6.9%	

Bozrah	East Lyme	Griswold	Groton
Ledyard	Lisbon	Montville	New London

Norwich Old Lyme Old Saybrook Preston
 Sprague Stonington Waterford

Non SMSA

Female

Minority

Litchfield – Windham	5.9%
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Abington	Ashford	Ballouville	Bantam
Barkhamsted	Bethlehem	Bridgewater	Brooklyn
Canaan	Canterbury	Central Village	Cahplin
Colebrook	Cornwall	Cornwall Bridge	Danielson
Dayville	East Canaan	East Killingly	East Woodstock
Eastford	Falls Village	Gaylordsville	Goshen
Grosvenor Dale	Hampton	Harwinton	Kent
Killignly	Lakeside	Litchfield	Moosup
Morris	New Milford	New Preston	New Preston Marble Dale
Norfolk	North Canaan	No. Grosvenordale	North Windham
Oneco	Pequabuck	Pine Meadow	Plainfield
Pleasant Valley	Pomfret	Pomfret Center	Putnam
Quinebaug	Riverton	Rogers	Roxbury
Salisbury	Scotland	Sharon	South Kent
South Woodstock	Sterling	Taconic	Terryville
Thompson	Torrington	Warren	Warrenville
Washington	Washington Depot	Wauregan	West Cornwall
Willimantic	Winchester	Winchester Center	Windham
Winsted	Woodstock	Woodstock Valley	

EXHIBIT D

Health Insurance Portability and Accountability Act of 1996 (“HIPAA”).

- (a) If the Contactor is a Business Associate under the requirements of the Health Insurance Portability and Accountability Act of 1996 (“HIPAA”), the Contractor must comply with all terms and conditions of this Section of the Contract. If the Contractor is not a Business Associate under HIPAA, this Section of the Contract does not apply to the Contractor for this Contract.
- (b) The Contractor is required to safeguard the use, publication and disclosure of information on all applicants for, and all clients who receive, services under the Contract in accordance with all applicable federal and state law regarding confidentiality, which includes but is not limited to HIPAA, more specifically with the Privacy and Security Rules at 45 C.F.R. Part 160 and Part 164, subparts A, C, and E; and
- (c) The State of Connecticut Agency named on page 1 of this Contract (hereinafter the “Department”) is a “covered entity” as that term is defined in 45 C.F.R. § 160.103; and
- (d) The Contractor, on behalf of the Department, performs functions that involve the use or disclosure of “individually identifiable health information,” as that term is defined in 45 C.F.R. § 160.103; and
- (e) The Contractor is a “business associate” of the Department, as that term is defined in 45 C.F.R. § 160.103; and
- (f) The Contractor and the Department agree to the following in order to secure compliance with the HIPAA, the requirements of Subtitle D of the Health Information Technology for Economic and Clinical Health Act (hereinafter the HITECH Act), (Pub. L. 111-5, sections 13400 to 13423), and more specifically with the Privacy and Security Rules at 45 C.F.R. Part 160 and Part 164, subparts A, C, and E.
- (g) Definitions
 - (1) “Breach shall have the same meaning as the term is defined in section 13400 of the HITECH Act (42 U.S.C. §17921(1))
 - (2) “Business Associate” shall mean the Contractor.
 - (3) “Covered Entity” shall mean the Department of the State of Connecticut named on page 1 of this Contract.
 - (4) “Designated Record Set” shall have the same meaning as the term “designated record set” in 45 C.F.R. § 164.501.
 - (5) “Electronic Health Record” shall have the same meaning as the term is defined in section 13400 of the HITECH Act (42 U.S.C. §17921(5))

- (6) "Individual" shall have the same meaning as the term "individual" in 45 C.F.R. § 160.103 and shall include a person who qualifies as a personal representative as defined in 45 C.F.R. § 164.502(g).
 - (7) "Privacy Rule" shall mean the Standards for Privacy of Individually Identifiable Health Information at 45 C.F.R. part 160 and parts 164, subparts A and E.
 - (8) "Protected Health Information" or "PHI" shall have the same meaning as the term "protected health information" in 45 C.F.R. § 160.103, limited to information created or received by the Business Associate from or on behalf of the Covered Entity.
 - (9) "Required by Law" shall have the same meaning as the term "required by law" in 45 C.F.R. § 164.103.
 - (10) "Secretary" shall mean the Secretary of the Department of Health and Human Services or his designee.
 - (11) "More stringent" shall have the same meaning as the term "more stringent" in 45 C.F.R. § 160.202.
 - (12) "This Section of the Contract" refers to the HIPAA Provisions stated herein, in their entirety.
 - (13) "Security Incident" shall have the same meaning as the term "security incident" in 45 C.F.R. § 164.304.
 - (14) "Security Rule" shall mean the Security Standards for the Protection of Electronic Protected Health Information at 45 C.F.R. part 160 and parts 164, subpart A and C.
 - (15) "Unsecured protected health information" shall have the same meaning as the term as defined in section 13402(h)(1)(A) of HITECH. Act. (42 U.S.C. §17932(h)(1)(A)).
- (h) Obligations and Activities of Business Associates.
- (1) Business Associate agrees not to use or disclose PHI other than as permitted or required by this Section of the Contract or as Required by Law.
 - (2) Business Associate agrees to use appropriate safeguards to prevent use or disclosure of PHI other than as provided for in this Section of the Contract.
 - (3) Business Associate agrees to use administrative, physical and technical safeguards that reasonably and appropriately protect the confidentiality, integrity, and availability of electronic protected health information that it creates, receives, maintains, or transmits on behalf of the Covered Entity.

- (4) Business Associate agrees to mitigate, to the extent practicable, any harmful effect that is known to the Business Associate of a use or disclosure of PHI by Business Associate in violation of this Section of the Contract.
- (5) Business Associate agrees to report to Covered Entity any use or disclosure of PHI not provided for by this Section of the Contract or any security incident of which it becomes aware.
- (6) Business Associate agrees to insure that any agent, including a subcontractor, to whom it provides PHI received from, or created or received by Business Associate, on behalf of the Covered Entity, agrees to the same restrictions and conditions that apply through this Section of the Contract to Business Associate with respect to such information.
- (7) Business Associate agrees to provide access, at the request of the Covered Entity, and in the time and manner agreed to by the parties, to PHI in a Designated Record Set, to Covered Entity or, as directed by Covered Entity, to an Individual in order to meet the requirements under 45 C.F.R. § 164.524.
- (8) Business Associate agrees to make any amendments to PHI in a Designated Record Set that the Covered Entity directs or agrees to pursuant to 45 C.F.R. § 164.526 at the request of the Covered Entity, and in the time and manner agreed to by the parties.
- (9) Business Associate agrees to make internal practices, books, and records, including policies and procedures and PHI, relating to the use and disclosure of PHI received from, or created or received by, Business Associate on behalf of Covered Entity, available to Covered Entity or to the Secretary in a time and manner agreed to by the parties or designated by the Secretary, for purposes of the Secretary determining Covered Entity's compliance with the Privacy Rule.
- (10) Business Associate agrees to document such disclosures of PHI and information related to such disclosures as would be required for Covered Entity to respond to a request by an Individual for an accounting of disclosures of PHI in accordance with 45 C.F.R. § 164.528 and section 13405 of the HITECH Act (42 U.S.C. § 17935) and any regulations promulgated thereunder.
- (11) Business Associate agrees to provide to Covered Entity, in a time and manner agreed to by the parties, information collected in accordance with clause h. (10) of this Section of the Contract, to permit Covered Entity to respond to a request by an Individual for an accounting of disclosures of PHI in accordance with 45 C.F.R. § 164.528 and section 13405 of the HITECH Act (42 U.S.C. § 17935) and any regulations promulgated thereunder. Business Associate agrees at the Covered Entity's direction to provide an accounting of disclosures of PHI directly to an individual in accordance with 45 C.F.R. § 164.528 and section 13405 of the HITECH Act (42 U.S.C. § 17935) and any regulations promulgated thereunder.
- (12) Business Associate agrees to comply with any state or federal law that is more stringent than the Privacy Rule.

- (13) Business Associate agrees to comply with the requirements of the HITECH Act relating to privacy and security that are applicable to the Covered Entity and with the requirements of 45 C.F.R. sections 164.504(e), 164.308, 164.310, 164.312, and 164.316.
- (14) In the event that an individual requests that the Business Associate (a) restrict disclosures of PHI; (b) provide an accounting of disclosures of the individual's PHI; or (c) provide a copy of the individual's PHI in an electronic health record, the Business Associate agrees to notify the covered entity, in writing, within two business days of the request.
- (15) Business Associate agrees that it shall not, directly or indirectly, receive any remuneration in exchange for PHI of an individual without (1) the written approval of the covered entity, unless receipt of remuneration in exchange for PHI is expressly authorized by this Contract and (2) the valid authorization of the individual, except for the purposes provided under section 13405(d)(2) of the HITECH Act,(42 U.S.C. § 17935(d)(2)) and in any accompanying regulations
- (16) Obligations in the Event of a Breach
- A. The Business Associate agrees that, following the discovery of a breach of unsecured protected health information, it shall notify the Covered Entity of such breach in accordance with the requirements of section 13402 of HITECH (42 U.S.C. 17932(b) and the provisions of this Section of the Contract.
 - B. Such notification shall be provided by the Business Associate to the Covered Entity without unreasonable delay, and in no case later than 30 days after the breach is discovered by the Business Associate, except as otherwise instructed in writing by a law enforcement official pursuant to section 13402 (g) of HITECH (42 U.S.C. 17932(g)) . A breach is considered discovered as of the first day on which it is, or reasonably should have been, known to the Business Associate. The notification shall include the identification and last known address, phone number and email address of each individual (or the next of kin of the individual if the individual is deceased) whose unsecured protected health information has been, or is reasonably believed by the Business Associate to have been, accessed, acquired, or disclosed during such breach.
 - C. The Business Associate agrees to include in the notification to the Covered Entity at least the following information:
 - 1. A brief description of what happened, including the date of the breach and the date of the discovery of the breach, if known.
 - 2. A description of the types of unsecured protected health information that were involved in the breach (such as full name, Social Security number, date of birth, home address, account number, or disability code).
 - 3. The steps the Business Associate recommends that individuals take to protect themselves from potential harm resulting from the breach.

4. A detailed description of what the Business Associate is doing to investigate the breach, to mitigate losses, and to protect against any further breaches.
 5. Whether a law enforcement official has advised either verbally or in writing the Business Associate that he or she has determined that notification or notice to individuals or the posting required under section 13402 of the HITECH Act would impede a criminal investigation or cause damage to national security and; if so, include contact information for said official.
- D. Business Associate agrees to provide appropriate staffing and have established procedures to ensure that individuals informed by the Covered Entity of a breach by the Business Associate have the opportunity to ask questions and contact the Business Associate for additional information regarding the breach. Such procedures shall include a toll-free telephone number, an e-mail address, a posting on its Web site and a postal address. Business Associate agrees to include in the notification of a breach by the Business Associate to the Covered Entity, a written description of the procedures that have been established to meet these requirements. Costs of such contact procedures will be borne by the Contractor.
- E. Business Associate agrees that, in the event of a breach, it has the burden to demonstrate that it has complied with all notifications requirements set forth above, including evidence demonstrating the necessity of a delay in notification to the Covered Entity.
- (i) Permitted Uses and Disclosure by Business Associate.
- (1) General Use and Disclosure Provisions Except as otherwise limited in this Section of the Contract, Business Associate may use or disclose PHI to perform functions, activities, or services for, or on behalf of, Covered Entity as specified in this Contract, provided that such use or disclosure would not violate the Privacy Rule if done by Covered Entity or the minimum necessary policies and procedures of the Covered Entity.
 - (2) Specific Use and Disclosure Provisions
 - (A) Except as otherwise limited in this Section of the Contract, Business Associate may use PHI for the proper management and administration of Business Associate or to carry out the legal responsibilities of Business Associate.
 - (B) Except as otherwise limited in this Section of the Contract, Business Associate may disclose PHI for the proper management and administration of Business Associate, provided that disclosures are Required by Law, or Business Associate obtains reasonable assurances from the person to whom the information is disclosed that it will remain confidential and used or further disclosed only as Required by Law or

for the purpose for which it was disclosed to the person, and the person notifies Business Associate of any instances of which it is aware in which the confidentiality of the information has been breached.

(C) Except as otherwise limited in this Section of the Contract, Business Associate may use PHI to provide Data Aggregation services to Covered Entity as permitted by 45 C.F.R. § 164.504(e)(2)(i)(B).

(j) Obligations of Covered Entity.

(1) Covered Entity shall notify Business Associate of any limitations in its notice of privacy practices of Covered Entity, in accordance with 45 C.F.R. § 164.520, or to the extent that such limitation may affect Business Associate's use or disclosure of PHI.

(2) Covered Entity shall notify Business Associate of any changes in, or revocation of, permission by Individual to use or disclose PHI, to the extent that such changes may affect Business Associate's use or disclosure of PHI.

(3) Covered Entity shall notify Business Associate of any restriction to the use or disclosure of PHI that Covered Entity has agreed to in accordance with 45 C.F.R. § 164.522, to the extent that such restriction may affect Business Associate's use or disclosure of PHI.

(k) Permissible Requests by Covered Entity. Covered Entity shall not request Business Associate to use or disclose PHI in any manner that would not be permissible under the Privacy Rule if done by the Covered Entity, except that Business Associate may use and disclose PHI for data aggregation, and management and administrative activities of Business Associate, as permitted under this Section of the Contract.

(l) Term and Termination.

(1) Term. The Term of this Section of the Contract shall be effective as of the date the Contract is effective and shall terminate when the information collected in accordance with clause h. (10) of this Section of the Contract is provided to the Covered Entity and all of the PHI provided by Covered Entity to Business Associate, or created or received by Business Associate on behalf of Covered Entity, is destroyed or returned to Covered Entity, or, if it is infeasible to return or destroy PHI, protections are extended to such information, in accordance with the termination provisions in this Section.

(2) Termination for Cause Upon Covered Entity's knowledge of a material breach by Business Associate, Covered Entity shall either:

(A) Provide an opportunity for Business Associate to cure the breach or end the violation and terminate the Contract if Business Associate does not cure the breach or end the violation within the time specified by the Covered Entity; or

(B) Immediately terminate the Contract if Business Associate has breached a material term of this Section of the Contract and cure is not possible; or

(C) If neither termination nor cure is feasible, Covered Entity shall report the violation to the Secretary.

(3) Effect of Termination

(A) Except as provided in (1)(2) of this Section of the Contract, upon termination of this Contract, for any reason, Business Associate shall return or destroy all PHI received from Covered Entity, or created or received by Business Associate on behalf of Covered Entity. Business Associate shall also provide the information collected in accordance with clause h. (10) of this Section of the Contract to the Covered Entity within ten business days of the notice of termination. This provision shall apply to PHI that is in the possession of subcontractors or agents of Business Associate. Business Associate shall retain no copies of the PHI.

(B) In the event that Business Associate determines that returning or destroying the PHI is infeasible, Business Associate shall provide to Covered Entity notification of the conditions that make return or destruction infeasible. Upon documentation by Business Associate that return or destruction of PHI is infeasible, Business Associate shall extend the protections of this Section of the Contract to such PHI and limit further uses and disclosures of PHI to those purposes that make return or destruction infeasible, for as long as Business Associate maintains such PHI. Infeasibility of the return or destruction of PHI includes, but is not limited to, requirements under state or federal law that the Business Associate maintains or preserves the PHI or copies thereof.

(m) Miscellaneous Provisions.

(1) Regulatory References. A reference in this Section of the Contract to a section in the Privacy Rule means the section as in effect or as amended.

(2) Amendment. The Parties agree to take such action as is necessary to amend this Section of the Contract from time to time as is necessary for Covered Entity to comply with requirements of the Privacy Rule and the Health Insurance Portability and Accountability Act of 1996, Pub. L. No. 104-191.

(3) Survival. The respective rights and obligations of Business Associate shall survive the termination of this Contract.

(4) Effect on Contract. Except as specifically required to implement the purposes of this Section of the Contract, all other terms of the Contract shall remain in force and effect.

(5) Construction. This Section of the Contract shall be construed as broadly as necessary to implement and comply with the Privacy Standard. Any ambiguity in this Section of the Contract shall be resolved in favor of a meaning that complies, and is consistent with, the Privacy Standard.

(6) Disclaimer. Covered Entity makes no warranty or representation that compliance with this Section of the Contract will be adequate or satisfactory for Business Associate's own purposes. Covered Entity shall not be liable to Business Associate for any claim, civil or criminal penalty, loss or damage related to or arising from the unauthorized use or disclosure of PHI by Business Associate or any of its officers, directors, employees, contractors or agents, or any third party to whom Business Associate has disclosed PHI contrary to the provisions of this Contract or applicable law. Business Associate is solely responsible for all decisions made, and actions taken, by Business Associate regarding the safeguarding, use and disclosure of PHI within its possession, custody or control.

(7) Indemnification. The Business Associate shall indemnify and hold the Covered Entity harmless from and against any and all claims, liabilities, judgments, fines, assessments, penalties, awards and any statutory damages that may be imposed or assessed pursuant to HIPAA, as amended or the HITECH Act, including, without limitation, attorney's fees, expert witness fees, costs of investigation, litigation or dispute resolution, and costs awarded thereunder, relating to or arising out of any violation by the Business Associate and its agents, including subcontractors, of any obligation of Business Associate and its agents, including subcontractors, under this section of the contract, under HIPAA, the HITECH Act, the Privacy Rule and the Security Rule.

**Notice to Executive Branch State Contractors and Prospective State
Contractors of Campaign Contribution and Solicitation Limitations**

This notice is provided under the authority of Connecticut General Statutes §9-612 (f) (2) and is for the purpose of informing state contractors and prospective state contractors of the following law (italicized words are defined on the reverse side of this page).

CAMPAIGN CONTRIBUTION AND SOLICITATION LIMITATIONS

No *state contractor, prospective state contractor, principal of a state contractor or principal of a prospective state contractor*, with regard to a *state contract or state contract solicitation* with or from a state agency in the executive branch or a quasi-public agency or a holder, or principal of a holder, of a valid prequalification certificate, shall make a contribution to (i) an exploratory committee or candidate committee established by a candidate for nomination or election to the office of Governor, Lieutenant Governor, Attorney General, State Comptroller, Secretary of the State or State Treasurer, (ii) a political committee authorized to make contributions or expenditures to or for the benefit of such candidates, or (iii) a party committee (which includes town committees).

In addition, no holder or principal of a holder of a valid prequalification certificate, shall make a contribution to (i) an exploratory committee or candidate committee established by a candidate for nomination or election to the office of State senator or State representative, (ii) a political committee authorized to make contributions or expenditures to or for the benefit of such candidates, or (iii) a party committee.

On and after January 1, 2011, no state contractor, prospective state contractor, principal of a state contractor or principal of a prospective state contractor, with regard to a state contract or state contract solicitation with or from a state agency in the executive branch or a quasi-public agency or a holder, or principal of a holder of a valid prequalification certificate, shall **knowingly solicit** contributions from the state contractor's or prospective state contractor's employees or from a *subcontractor or principals of the subcontractor* on behalf of (i) an exploratory committee or candidate committee established by a candidate for nomination or election to the office of Governor, Lieutenant Governor, Attorney General, State Comptroller, Secretary of the State or State Treasurer, (ii) a political committee authorized to make contributions or expenditures to or for the benefit of such candidates, or (iii) a party committee.

DUTY TO INFORM

State contractors and prospective state contractors are required to inform their principals of the above prohibitions, as applicable, and the possible penalties and other consequences of any violation thereof.

PENALTIES FOR VIOLATIONS

Contributions or solicitations of contributions made in violation of the above prohibitions may result in the following civil and criminal penalties:

Civil penalties—Up to \$2,000 or twice the amount of the prohibited contribution, whichever is greater, against a principal or a contractor. Any state contractor or prospective state contractor which fails to make reasonable efforts to comply with the provisions requiring notice to its principals of these prohibitions and the possible consequences of their violations may also be subject to civil penalties of up to \$2,000 or twice the amount of the prohibited contributions made by their principals.

Criminal penalties—Any knowing and willful violation of the prohibition is a Class D felony, which may subject the violator to imprisonment of not more than 5 years, or not more than \$5,000 in fines, or both.

CONTRACT CONSEQUENCES

In the case of a state contractor, contributions made or solicited in violation of the above prohibitions may result in the contract being voided.

In the case of a prospective state contractor, contributions made or solicited in violation of the above prohibitions shall result in the contract described in the state contract solicitation not being awarded to the prospective state contractor, unless the State Elections Enforcement Commission determines that mitigating circumstances exist concerning such violation.

The State shall not award any other state contract to anyone found in violation of the above prohibitions for a period of one year after the election for which such contribution is made or solicited, unless the State Elections Enforcement Commission determines that mitigating circumstances exist concerning such violation.

Additional information may be found on the website of the State Elections Enforcement Commission, www.ct.gov/sec. Click on the link to "Lobbyist/Contractor Limitations."

DEFINITIONS

“State contractor” means a person, business entity or nonprofit organization that enters into a state contract. Such person, business entity or nonprofit organization shall be deemed to be a state contractor until December thirty-first of the year in which such contract terminates. “State contractor” does not include a municipality or any other political subdivision of the state, including any entities or associations duly created by the municipality or political subdivision exclusively amongst themselves to further any purpose authorized by statute or charter, or an employee in the executive or legislative branch of state government or a quasi-public agency, whether in the classified or unclassified service and full or part-time, and only in such person’s capacity as a state or quasi-public agency employee.

“Prospective state contractor” means a person, business entity or nonprofit organization that (i) submits a response to a state contract solicitation by the state, a state agency or a quasi-public agency, or a proposal in response to a request for proposals by the state, a state agency or a quasi-public agency, until the contract has been entered into, or (ii) holds a valid prequalification certificate issued by the Commissioner of Administrative Services under section 4a-100. “Prospective state contractor” does not include a municipality or any other political subdivision of the state, including any entities or associations duly created by the municipality or political subdivision exclusively amongst themselves to further any purpose authorized by statute or charter, or an employee in the executive or legislative branch of state government or a quasi-public agency, whether in the classified or unclassified service and full or part-time, and only in such person’s capacity as a state or quasi-public agency employee.

“Principal of a state contractor or prospective state contractor” means (i) any individual who is a member of the board of directors of, or has an ownership interest of five per cent or more in, a state contractor or prospective state contractor, which is a business entity, except for an individual who is a member of the board of directors of a nonprofit organization, (ii) an individual who is employed by a state contractor or prospective state contractor, which is a business entity, as president, treasurer or executive vice president, (iii) an individual who is the chief executive officer of a state contractor or prospective state contractor, which is not a business entity, or if a state contractor or prospective state contractor has no such officer, then the officer who duly possesses comparable powers and duties, (iv) an officer or an employee of any state contractor or prospective state contractor who has *managerial or discretionary responsibilities with respect to a state contract*, (v) the spouse or a *dependent child* who is eighteen years of age or older of an individual described in this subparagraph, or (vi) a political committee established or controlled by an individual described in this subparagraph or the business entity or nonprofit organization that is the state contractor or prospective state contractor.

“State contract” means an agreement or contract with the state or any state agency or any quasi-public agency, let through a procurement process or otherwise, having a value of fifty thousand dollars or more, or a combination or series of such agreements or contracts having a value of one hundred thousand dollars or more in a calendar year, for (i) the rendition of services, (ii) the furnishing of any goods, material, supplies, equipment or any items of any kind, (iii) the construction, alteration or repair of any public building or public work, (iv) the acquisition, sale or lease of any land or building, (v) a licensing arrangement, or (vi) a grant, loan or loan guarantee. “State contract” does not include any agreement or contract with the state, any state agency or any quasi-public agency that is exclusively federally funded, an education loan, a loan to an individual for other than commercial purposes or any agreement or contract between the state or any state agency and the United States Department of the Navy or the United States Department of Defense.

“State contract solicitation” means a request by a state agency or quasi-public agency, in whatever form issued, including, but not limited to, an invitation to bid, request for proposals, request for information or request for quotes, inviting bids, quotes or other types of submittals, through a competitive procurement process or another process authorized by law waiving competitive procurement.

“Managerial or discretionary responsibilities with respect to a state contract” means having direct, extensive and substantive responsibilities with respect to the negotiation of the state contract and not peripheral, clerical or ministerial responsibilities.

“Dependent child” means a child residing in an individual’s household who may legally be claimed as a dependent on the federal income tax of such individual.

“Solicit” means (A) requesting that a contribution be made, (B) participating in any fundraising activities for a candidate committee, exploratory committee, political committee or party committee, including, but not limited to, forwarding tickets to potential contributors, receiving contributions for transmission to any such committee, serving on the committee that is hosting a fundraising event, introducing the candidate or making other public remarks at a fundraising event, being honored or otherwise recognized at a fundraising event, or bundling contributions, (C) serving as chairperson, treasurer or deputy treasurer of any such committee, or (D) establishing a political committee for the sole purpose of soliciting or receiving contributions for any committee. Solicit does not include: (i) making a contribution that is otherwise permitted by Chapter 155 of the Connecticut General Statutes; (ii) informing any person of a position taken by a candidate for public office or a public official, (iii) notifying the person of any activities of, or contact information for, any candidate for public office; or (iv) serving as a member in any party committee or as an officer of such committee that is not otherwise prohibited in this section.

“Subcontractor” means any person, business entity or nonprofit organization that contracts to perform part or all of the obligations of a state contractor’s state contract. Such person, business entity or nonprofit organization shall be deemed to be a subcontractor until December thirty first of the year in which the subcontract terminates. “Subcontractor” does not include (i) a municipality or any other political subdivision of the state, including any entities or associations duly created by the municipality or political subdivision exclusively amongst themselves to further any purpose authorized by statute or charter, or (ii) an employee in the executive or legislative branch of state government or a quasi-public agency, whether in the classified or unclassified service and full or part-time, and only in such person’s capacity as a state or quasi-public agency employee.

“Principal of a subcontractor” means (i) any individual who is a member of the board of directors of, or has an ownership interest of five per cent or more in, a subcontractor, which is a business entity, except for an individual who is a member of the board of directors of a nonprofit organization, (ii) an individual who is employed by a subcontractor, which is a business entity, as president, treasurer or executive vice president, (iii) an individual who is the chief executive officer of a subcontractor, which is not a business entity, or if a subcontractor has no such officer, then the officer who duly possesses comparable powers and duties, (iv) an officer or an employee of any subcontractor who has managerial or

discretionary responsibilities with respect to a subcontract with a state contractor, (v) the spouse or a dependent child who is eighteen years of age or older of an individual described in this subparagraph, or (vi) a political committee established or controlled by an individual described in this subparagraph or the business entity or nonprofit organization that is the subcontractor.

EXHIBIT F

(Federal wage rate package will be inserted here for final executed contract only. Refer to NTC – Federal Wage Determinations)

EXHIBIT G

(State wages will be inserted here)

Project: State Project No. 0096-0201 Rehabilitation Of Bridge Nos 01218 & 04180

**Minimum Rates and Classifications
for Heavy/Highway Construction**

**Connecticut Department of Labor
Wage and Workplace Standards Division**

ID#: H 26863

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: 0096-0201

Project Town: Newtown

FAP Number:

State Number:

Project: State Project No. 0096-0201 Rehabilitation Of Bridge Nos 01218 & 04180

CLASSIFICATION	Hourly Rate	Benefits
1) Boilermaker	33.79	34% + 8.96
1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	34.72	32.15
2) Carpenters, Piledrivermen	33.53	25.66
2a) Diver Tenders	33.53	25.66

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3) Divers	41.99	25.66
03a) Millwrights	34.04	26.09
4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	51.00	21.80
4a) Painters: Brush and Roller	34.62	21.80
4b) Painters: Spray Only	36.62	21.80
4c) Painters: Steel Only	35.62	21.80
4d) Painters: Blast and Spray	37.62	21.80

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4e) Painters: Tanks, Tower and Swing	36.62	21.80
5) Electrician (Trade License required: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	39.62	27.25+3% of gross wage
6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection	36.67	35.77 + a
7) Plumbers (Trade License required: (P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2) and Pipefitters (Including HVAC Work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4 G-1, G-2, G-8, G-9)	43.62	32.06
----LABORERS-----		
8) Group 1: Laborer (Unskilled), Common or General, acetylene burner, concrete specialist	30.75	20.84
9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen	31.00	20.84

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10) Group 3: Pipelayers	31.25	20.84
11) Group 4: Jackhammer/Pavement breaker (handheld); mason tenders (cement/concrete), catch basin builders, asphalt rakers, air track operators, block paver, curb setter and forklift operators	31.25	20.84
12) Group 5: Toxic waste removal (non-mechanical systems)	32.75	20.84
13) Group 6: Blasters	32.50	20.84
Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)	31.75	20.84
Group 8: Traffic control signalmen	18.00	20.84
Group 9: Hydraulic Drills	29.30	18.90

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----LABORERS (TUNNEL CONSTRUCTION, FREE AIR). Shield Drive and
Liner Plate Tunnels in Free Air.----

13a) Miners, Motormen, Mucking Machine Operators, Nozzle Men, Grout Men, Shaft & Tunnel Steel & Rodmen, Shield & Erector, Arm Operator, Cable Tenders	32.98	20.84 + a
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13b) Brakemen, Trackmen	32.01	20.84 + a
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----CLEANING, CONCRETE AND CAULKING TUNNEL----

14) Concrete Workers, Form Movers, and Strippers	32.01	20.84 + a
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15) Form Erectors	32.34	20.84 + a
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----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL
IN FREE AIR:----

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16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers	32.01	20.84 + a
17) Laborers Topside, Cage Tenders, Bellman	31.90	20.84 + a
18) Miners	32.98	20.84 + a
----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR: ----		
18a) Blaster	39.47	20.84 + a
19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	39.27	20.84 + a
20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	37.29	20.84 + a

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21) Mucking Machine Operator	40.06	20.84 + a
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---TRUCK DRIVERS---(*see note below)

Two axle trucks	29.51	24.52 + a
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Three axle trucks; two axle ready mix	29.62	24.52 + a
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Three axle ready mix	29.67	24.52 + a
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Four axle trucks, heavy duty trailer (up to 40 tons)	29.72	24.52 + a
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Four axle ready-mix	29.77	24.52 + a
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Heavy duty trailer (40 tons and over)	29.98	24.52 + a
Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids)	29.77	24.52 + a

---POWER EQUIPMENT OPERATORS---

Group 1: Crane handling or erecting structural steel or stone, hoisting engineer (2 drums or over), front end loader (7 cubic yards or over), Work Boat 26 ft. & Over, Tunnel Boring Machines. (Trade License Required)	40.97	24.80 + a
Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver (\$3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required)	40.64	24.80 + a
Group 3: Excavator/Backhoe under 2 cubic yards; Cranes (under 100 ton rated capacity), Gradall; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar); Grader Operator; Bulldozer Fine Grade (slopes, shaping, laser or GPS, etc.). (Trade License Required)	39.88	24.80 + a
Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper)	39.48	24.80 + a

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Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Spreader; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24" Mandrell)	38.87	24.80 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	38.87	24.80 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	38.55	24.80 + a
Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and Under Mandrel).	38.20	24.80 + a
Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine.	37.79	24.80 + a
Group 9: Front End Loader (under 3 cubic yards), Skid Steer Loader regardless of attachments (Bobcat or Similar); Fork Lift, Power Chipper; Landscape Equipment (including hydroseeder).	37.34	24.80 + a
Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc.	35.24	24.80 + a

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Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment.	35.24	24.80 + a
Group 12: Wellpoint Operator.	35.18	24.80 + a
Group 13: Compressor Battery Operator.	34.58	24.80 + a
Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain).	33.41	24.80 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	32.99	24.80 + a
Group 16: Maintenance Engineer/Oiler	32.32	24.80 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	36.76	24.80 + a

Project: State Project No. 0096-0201 Rehabilitation Of Bridge Nos 01218 & 04180

Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).	34.26	24.80 + a
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**NOTE: SEE BELOW

---LINE CONSTRUCTION---(Railroad Construction and Maintenance)---

20) Lineman, Cable Splicer, Technician	48.19	6.5% + 22.00
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21) Heavy Equipment Operator	42.26	6.5% + 19.88
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22) Equipment Operator, Tractor Trailer Driver, Material Men	40.96	6.5% + 19.21
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23) Driver Groundmen	26.50	6.5% + 9.00
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23a) Truck Driver	40.96	6.5% + 17.76
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---LINE CONSTRUCTION---

24) Driver Groundmen	30.92	6.5% + 9.70
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25) Groundmen	22.67	6.5% + 6.20
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26) Heavy Equipment Operators	37.10	6.5% + 10.70
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27) Linemen, Cable Splicers, Dynamite Men	41.22	6.5% + 12.20
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28) Material Men, Tractor Trailer Drivers, Equipment Operators	35.04	6.5% + 10.45
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01) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except its removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters. ****See Laborers Group 5 and 7****

Project: State Project No. 0096-0201 Rehabilitation Of Bridge Nos 01218 & 04180

Welders: Rate for craft to which welding is incidental.

**Note: Hazardous waste removal work receives additional \$1.25 per hour for truck drivers.*

***Note: Hazardous waste premium \$3.00 per hour over classified rate*

ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra \$4.00 premium in addition to the hourly wage rate and benefit contributions:

1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)

2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson

3) Cranes (under 100 ton rated capacity)

Crane with 150 ft. boom (including jib) - \$1.50 extra

Crane with 200 ft. boom (including jib) - \$2.50 extra

Crane with 250 ft. boom (including jib) - \$5.00 extra

Crane with 300 ft. boom (including jib) - \$7.00 extra

Crane with 400 ft. boom (including jib) - \$10.00 extra

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyman instructing and supervising the work of each apprentice in a specific trade.

~~Connecticut General Statute Section 31-55a: Annual Adjustments to wage rates by contractors doing state work ~~

The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.

Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.

It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.

The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol.

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.

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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:

Thursday, January 09, 2020

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.

Information Bulletin ***Occupational Classifications***

The Connecticut Department of Labor has the responsibility to properly determine "job classification" on prevailing wage projects covered under C.G.S. Section 31-53(d).

Note: This information is intended to provide a sample of some occupational classifications for guidance purposes only. It is not an all-inclusive list of each occupation's duties. This list is being provided only to highlight some areas where a contractor may be unclear regarding the proper classification. If unsure, the employer should seek guidelines for CTDOL.

Below are additional clarifications of specific job duties performed for certain classifications:

- **ASBESTOS WORKERS**

Applies all insulating materials, protective coverings, coatings and finishes to all types of mechanical systems.

- **ASBESTOS INSULATOR**

Handle, install apply, fabricate, distribute, prepare, alter, repair, dismantle, heat and frost insulation, including penetration and fire stopping work on all penetration fire stop systems.

- **BOILERMAKERS**

Erects hydro plants, incomplete vessels, steel stacks, storage tanks for water, fuel, etc. Builds incomplete boilers, repairs heat exchanges and steam generators.

- **BRICKLAYERS, CEMENT MASONS, CEMENT FINISHERS, MARBLE MASONS, PLASTERERS, STONE MASONS, PLASTERERS. STONE MASONS, TERRAZZO WORKERS, TILE SETTERS**

Lays building materials such as brick, structural tile and concrete cinder, glass, gypsum, terra cotta block. Cuts, tools and sets marble, sets stone, finishes concrete, applies decorative steel, aluminum and plastic tile, applies cements, sand, pigment and marble chips to floors, stairways, etc.

- **CARPENTERS, MILLWRIGHTS. PILEDRIVERMEN. LATHERS. RESILEINT FLOOR LAYERS, DOCK BUILDERS, DIKERS, DIVER TENDERS**

Constructs, erects, installs and repairs structures and fixtures of wood, plywood and wallboard. Installs, assembles, dismantles, moves industrial machinery. Drives piling into ground to provide foundations for structures such as buildings and bridges, retaining walls for earth embankments, such as cofferdams. Fastens wooden, metal or rockboard lath to walls, ceilings and partitions of buildings, acoustical tile layer, concrete form builder. Applies firestopping materials on fire resistive joint systems only. Installation of curtain/window walls only where attached to wood or metal studs. Installation of insulated material of all types whether blown, nailed or attached in other ways to walls, ceilings and floors of buildings. Assembly and installation of modular furniture/furniture systems. Free-standing furniture is not covered. This includes free standing: student chairs, study top desks, book box desks, computer furniture, dictionary stand, atlas stand, wood shelving, two-position information access station, file cabinets, storage cabinets, tables, etc.

- **LABORER, CLEANING**

- The clean up of any construction debris and the general (heavy/light) cleaning, including sweeping, wash down, mopping, wiping of the construction facility and its furniture, washing, polishing, and dusting.

- **DELIVERY PERSONNEL**

- If delivery of supplies/building materials is to one common point and stockpiled there, prevailing wages are not required. If the delivery personnel are involved in the distribution of the material to multiple locations within the construction site then they would have to be paid prevailing wages for the type of work performed: laborer, equipment operator, electrician, ironworker, plumber, etc.

- An example of this would be where delivery of drywall is made to a building and the delivery personnel distribute the drywall from one "stockpile" location to further sub-locations on each floor. Distribution of material around a construction site is the job of a laborer or tradesman, and not a delivery personnel.

- **ELECTRICIANS**

Install, erect, maintenance, alteration or repair of any wire, cable, conduit, etc., which generates, transforms, transmits or uses electrical energy for light, heat, power or other purposes, including the Installation or maintenance of telecommunication, LAN wiring or computer equipment, and low voltage wiring. ***License required per Connecticut General Statutes: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9.**

- **ELEVATOR CONSTRUCTORS**

Install, erect, maintenance and repair of all types of elevators, escalators, dumb waiters and moving walks. **License required by Connecticut General Statutes: R-1,2,5,6.*

- **FORK LIFT OPERATOR**

Laborers Group 4) Mason Tenders - operates forklift solely to assist a mason to a maximum height of nine (9) feet only.

Power Equipment Operator Group 9 - operates forklift to assist any trade, and to assist a mason to a height over nine (9) feet.

- **GLAZIERS**

Glazing wood and metal sash, doors, partitions, and 2 story aluminum storefronts. Installs glass windows, skylights, store fronts and display cases or surfaces such as building fronts, interior walls, ceilings and table tops and metal store fronts. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers, which require equal composite workforce.

- **IRONWORKERS**

Erection, installation and placement of structural steel, precast concrete, miscellaneous iron, ornamental iron, metal curtain wall, rigging and reinforcing steel. Handling, sorting, and installation of reinforcing steel (rebar). Metal bridge rail (traffic), metal bridge handrail, and decorative security fence installation. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers which require equal composite workforce.

- **INSULATOR**

- Installing fire stopping systems/materials for "Penetration Firestop Systems": transit to cables, electrical conduits, insulated pipes, sprinkler pipe penetrations, ductwork behind radiation, electrical cable trays, fire rated pipe penetrations, natural polypropylene, HVAC ducts, plumbing bare metal, telephone and communication wires, and boiler room ceilings.

- **LABORERS**

Acetylene burners, asphalt rakers, chain saw operators, concrete and power buggy operator, concrete saw operator, fence and guard rail erector (except metal bridge rail (traffic), decorative security fence (non-metal)).

installation.), hand operated concrete vibrator operator, mason tenders, pipelayers (installation of storm drainage or sewage lines on the street only), pneumatic drill operator, pneumatic gas and electric drill operator, powermen and wagon drill operator, air track operator, block paver, curb setters, blasters, concrete spreaders.

- **PAINTERS**

Maintenance, preparation, cleaning, blasting (water and sand, etc.), painting or application of any protective coatings of every description on all bridges and appurtenances of highways, roadways, and railroads. Painting, decorating, hardwood finishing, paper hanging, sign writing, scenic art work and drywall hhg for any and all types of building and residential work.

- **LEAD PAINT REMOVAL**

- Painter's Rate

1. Removal of lead paint from bridges.
2. Removal of lead paint as preparation of any surface to be repainted.
3. Where removal is on a Demolition project prior to reconstruction.

- Laborer's Rate

1. Removal of lead paint from any surface NOT to be repainted.
2. Where removal is on a *TOTAL* Demolition project only.

- **PLUMBERS AND PIPEFITTERS**

Installation, repair, replacement, alteration or maintenance of all plumbing, heating, cooling and piping. ****License required per Connecticut General Statutes: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2 S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4.***

- **POWER EQUIPMENT OPERATORS**

Operates several types of power construction equipment such as compressors, pumps, hoists, derricks, cranes, shovels, tractors, scrapers or motor graders, etc. Repairs and maintains equipment. ****License required, crane operators only, per Connecticut General Statutes.***

- **ROOFERS**

Covers roofs with composition shingles or sheets, wood shingles, slate or asphalt and gravel to waterproof roofs, including preparation of surface. (demolition or removal of any type of roofing and or clean-up of any and all areas where a roof is to be relaid.)

- **SHEETMETAL WORKERS**

Fabricate, assembles, installs and repairs sheetmetal products and equipment in such areas as ventilation, air-conditioning, warm air heating, restaurant equipment, architectural sheet metal work, sheetmetal roofing, and aluminum gutters. Fabrication, handling, assembling, erecting, altering, repairing, etc. of coated metal material panels and composite metal material panels when used on building exteriors and interiors as soffits, fascia, louvers, partitions, canopies, cornice, column covers, awnings, beam covers, cladding, sun shades, lighting troughs, spires, ornamental roofing, metal ceilings, mansards, copings, ornamental and ventilation hoods, vertical and horizontal siding panels, trim, etc. The sheet metal classification also applies to the vast variety of coated metal material panels and composite metal material panels that have evolved over the years as an alternative to conventional ferrous and non-ferrous metals like steel, iron, tin, copper, brass, bronze, aluminum, etc. Fabrication, handling, assembling, erecting, altering, repairing, etc. of architectural metal roof, standing seam roof, composite metal roof, metal and composite bathroom/toilet partitions, aluminum gutters, metal and composite lockers and shelving, kitchen equipment, and walk-in coolers. To include testing and air –balancing ancillary to installation and construction.

- **SPRINKLER FITTERS**

Installation, alteration, maintenance and repair of fire protection sprinkler systems.

****License required per Connecticut General Statutes: F-1,2,3,4.***

- **TILE MARBLE AND TERRAZZO FINISHERS**

Assists and tends the tile setter, marble mason and terrazzo worker in the performance of their duties.

- **TRUCK DRIVERS**

~How to pay truck drivers delivering asphalt is under REVISION~

Truck Drivers are requires to be paid prevailing wage for time spent "working" directly on the site. These drivers remain covered by the prevailing wage for any time spent transporting between the actual construction location and facilities (such as fabrication, plants, mobile factories, batch plant, borrow pits, job headquarters, tool yards, etc.) dedicated exclusively, or nearly so, to performance of the contract or project, which are so located in proximity to the actual construction location that it is reasonable to include them. ****License required, drivers only, per Connecticut General Statutes.***

For example:

- Material men and deliverymen are not covered under prevailing wage as long as they are not directly involved in the construction process. If, they unload the material, they would then be covered by prevailing wage for the classification they are performing work in: laborer, equipment operator, etc.
- Hauling material off site is not covered provided they are not dumping it at a location outlined above.
- Driving a truck on site and moving equipment or materials on site would be considered covered work, as this is part of the construction process.

➤ *Any questions regarding the proper classification should be directed to:*
Public Contract Compliance Unit
Wage and Workplace Standards Division
Connecticut Department of Labor
200 Folly Brook Blvd, Wethersfield, CT 06109
(860) 263-6543.

Statute 31-55a

Last Updated: June 02, 2008

You are here: [DOL Web Site](#) ▶ [Wage and Workplace Issues](#) ▶ Statute 31-55a

- Special Notice -

To All State and Political Subdivisions, Their Agents, and Contractors

Connecticut General Statute 31-55a - Annual adjustments to wage rates by contractors doing state work.

Each contractor that is awarded a contract on or after October 1, 2002, for (1) the construction of a state highway or bridge that falls under the provisions of section 31-54 of the general statutes, or (2) the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project that falls under the provisions of section 31-53 of the general statutes shall contact the Labor Commissioner on or before July first of each year, for the duration of such contract, to ascertain the prevailing rate of wages on an hourly basis and the amount of payment or contributions paid or payable on behalf of each mechanic, laborer or worker employed upon the work contracted to be done, and shall make any necessary adjustments to such prevailing rate of wages and such payment or contributions paid or payable on behalf of each such employee, effective each July first.

- The prevailing wage rates applicable to any contract or subcontract awarded on or after October 1, 2002 are subject to annual adjustments each July 1st for the duration of any project which was originally advertised for bids on or after October 1, 2002.
- Each contractor affected by the above requirement shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.
- It is the *contractor's* responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's Web Site. The annual adjustments will be posted on the Department of Labor Web page: www.ctdol.state.ct.us. For those without internet access, please contact the division listed below.
- The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project. All subsequent annual adjustments will be posted on our Web Site for contractor access.

Any questions should be directed to the Contract Compliance Unit, Wage and Workplace

Standards Division, Connecticut Department of Labor, 200 Folly Brook Blvd.,
Wethersfield, CT 06109 at (860)263-6790.

[Workplace Laws](#)

Published by the Connecticut Department of Labor, Project Management Office

November 29, 2006

Notice
To All Mason Contractors and Interested Parties
Regarding Construction Pursuant to Section 31-53 of the
Connecticut General Statutes (Prevailing Wage)

The Connecticut Labor Department Wage and Workplace Standards Division is empowered to enforce the prevailing wage rates on projects covered by the above referenced statute.

Over the past few years the Division has withheld enforcement of the rate in effect for workers who operate a forklift on a prevailing wage rate project due to a potential jurisdictional dispute.

The rate listed in the schedules and in our Occupational Bulletin (see enclosed) has been as follows:

Forklift Operator:

- **Laborers (Group 4) Mason Tenders** - operates forklift solely to assist a mason to a maximum height of nine feet only.
- **Power Equipment Operator (Group 9)** - operates forklift to assist any trade and to assist a mason to a height over nine feet.

The U.S. Labor Department conducted a survey of rates in Connecticut but it has not been published and the rate in effect remains as outlined in the above Occupational Bulletin.

Since this is a classification matter and not one of jurisdiction, effective January 1, 2007 the Connecticut Labor Department will enforce the rate on each schedule in accordance with our statutory authority.

Your cooperation in filing appropriate and accurate certified payrolls is appreciated.

Informational Bulletin

THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE

(applicable to public building contracts entered into *on or after July 1, 2007*, where the total cost of all work to be performed is at least \$100,000)

- (1) This requirement was created by Public Act No. 06-175, which is codified in Section 31-53b of the Connecticut General Statutes (pertaining to the prevailing wage statutes);
- (2) The course is required for public building construction contracts (projects funded in whole or in part by the state or any political subdivision of the state) entered into on or after July 1, 2007;
- (3) It is required of private employees (not state or municipal employees) and apprentices who perform manual labor for a general contractor or subcontractor on a public building project where the total cost of all work to be performed is at least \$100,000;
- (4) The ten-hour construction course pertains to the ten-hour Outreach Course conducted in accordance with federal OSHA Training Institute standards, and, for telecommunications workers, a ten-hour training course conducted in accordance with federal OSHA standard, 29 CFR 1910.268;
- (5) The internet website for the federal OSHA Training Institute is http://www.osha.gov/fso/ote/training/edcenters/fact_sheet.html;
- (6) The statutory language leaves it to the contractor and its employees to determine who pays for the cost of the ten-hour Outreach Course;
- (7) Within 30 days of receiving a contract award, a general contractor must furnish proof to the Labor Commissioner that all employees and apprentices performing manual labor on the project will have completed such a course;
- (8) Proof of completion may be demonstrated through either: (a) the presentation of a *bona fide* student course completion card issued by the federal OSHA Training Institute; *or* (2) the presentation of documentation provided to an employee by a trainer certified by the Institute pending the actual issuance of the completion card;
- (9) Any card with an issuance date more than 5 years prior to the commencement date of the construction project shall not constitute proof of compliance;

- (10) Each employer shall affix a copy of the construction safety course completion card to the certified payroll submitted to the contracting agency in accordance with Conn. Gen. Stat. § 31-53(f) on which such employee's name first appears;
- (11) Any employee found to be in non-compliance shall be subject to removal from the worksite if such employee does not provide satisfactory proof of course completion to the Labor Commissioner by the fifteenth day after the date the employee is determined to be in noncompliance;
- (12) Any such employee who is determined to be in noncompliance may continue to work on a public building construction project for a maximum of fourteen consecutive calendar days while bringing his or her status into compliance;
- (13) The Labor Commissioner may make complaint to the prosecuting authorities regarding any employer or agent of the employer, or officer or agent of the corporation who files a false certified payroll with respect to the status of an employee who is performing manual labor on a public building construction project;
- (14) The statute provides the minimum standards required for the completion of a safety course by manual laborers on public construction contracts; any contractor can exceed these minimum requirements; and
- (15) Regulations clarifying the statute are currently in the regulatory process, and shall be posted on the CTDOL website as soon as they are adopted in final form.
- (16) Any questions regarding this statute may be directed to the Wage and Workplace Standards Division of the Connecticut Labor Department via the internet website of <http://www.ctdol.state.ct.us/wgwkstnd/wgemenu.htm>; or by telephone at (860)263-6790.

THE ABOVE INFORMATION IS PROVIDED EXCLUSIVELY AS AN EDUCATIONAL RESOURCE, AND IS NOT INTENDED AS A SUBSTITUTE FOR LEGAL INTERPRETATIONS WHICH MAY ULTIMATELY ARISE CONCERNING THE CONSTRUCTION OF THE STATUTE OR THE REGULATIONS.

Sec. 31-53b. Construction safety and health course. Proof of completion required for employees on public building projects. Enforcement. Regulations. (a) Each contract entered into on or after July 1, 2007, for the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public building project by the state or any of its agents, or by an political subdivision of the state or any of its agents, where the total cost of all work to be performed by all contractors and subcontractors in connection with the contract is at least one hundred thousand dollars, shall contain a provision requiring that, not later than thirty days after the date such contract is awarded, each contractor furnish proof to the Labor Commissioner that all employees performing manual labor on or in such public building, pursuant to such contract, have completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, in the case of telecommunications employees, have completed at least ten hours of training in accordance with 29 CFR 1910.268.

(b) Any employee required to complete a construction safety and health course required under subsection (a) of this section who has not completed the course shall be subject to removal from the worksite if the employee does not provide documentation of having completed such course by the fifteenth day after the date the employee is found to be in noncompliance. The Labor Commissioner or said commissioner's designee shall enforce this section.

(c) Not later than January 1, 2007, the Labor Commissioner shall adopt regulations, in accordance with the provisions of chapter 54, to implement the provisions of subsections (a) and (b) of this section. Such regulations shall require that the ten-hour construction safety and health courses required under subsection (a) of this section be conducted in accordance with federal Occupational Safety and Health Administration Training Institute standards, or in accordance with 29 CFR 1910.268, as appropriate. The Labor Commissioner shall accept as sufficient proof of compliance with the provisions of subsection (a) or (b) of this section a student course completion card issued by the federal Occupational Safety and Health Administration Training Institute, or such other proof of compliance said commissioner deems appropriate, dated no earlier than five years before the commencement date of such public works project.

(d) For the purposes of this section, "public building" means a structure, paid for in whole or in part with state funds, within a roof and within exterior walls or fire walls, designed for the housing, shelter, enclosure and support or employment of people, animals or property of any kind, including, but not limited to, sewage treatment plants and water treatment plants, "Public building" does not include site work, roads or bridges, rail lines, parking lots or underground water, sewer or drainage systems including pump houses or other utility systems.

CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION

CONTRACTORS WAGE CERTIFICATION FORM

I, _____ of _____
Officer, Owner, Authorized Rep. Company Name

do hereby certify that the _____
Company Name

Street

City

and all of its subcontractors will pay all workers on the

Project Name and Number

Street and City

the wages as listed in the schedule of prevailing rates required for such project (a copy of which is attached hereto).

Signed

Subscribed and sworn to before me this _____ day of _____, 2004.

Notary Public

 Return to:

Connecticut Department of Labor
Wage & Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109