

LEGAL NOTICE

City of Bristol, Connecticut

Notice to Contractors:

Sealed bids for the construction of the following project will be received by the City of Bristol at the Purchasing Department, Bristol City Hall, Room 311, 111 North Main Street, Bristol, CT 06010 until May 1, 2024, 10:00 am after which time no further bids will be accepted. **NO EXCEPTIONS.** The bids will be publicly opened and read in the City Hall Purchasing Department, Room 310, 111 North Main Street, Bristol, CT 06010 at 10:00 am.

FEDERAL PROJECT

F.A.P. # 6017(012) City of Bristol, Connecticut
State Project No. 0017-0192
Bristol Project 2C24-096
Replacement of Bridge No. 04487
Contract Goal: 13% Disadvantaged Business Enterprises (DBEs)

The project is subject to Federal and State prevailing wage rate requirements.

The project consists of the Replacement of Bridge No. 04487, East Street over Pequabuck River.

The City of Bristol (Municipality) hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this advertisement, Disadvantaged Business Enterprises will be afforded full opportunity to submit bids in response to this invitation and that they will not be discriminated against on the grounds of race, color, national origin, sex, sexual orientation, mental retardation or physical disability, including but not limited to blindness, in consideration for an award.

"Bid Proposal Form", "Schedule of Prices", "Bid Bond", "Non Collusion Affidavit" and "Bidder's Prequalification" approval letter signed by the CTDOT Contracts Manager must be completed and returned with the submitted bid. **Failure to properly execute and include any one of these five documents in the bid submission will result in the bid not being read and the subsequent rejection of the bid.**

Plans and Specifications for the above project may be examined and/or obtained at Advanced Reprographics, 50 Corporate Avenue, Plainville, CT 06062, (860) 410-1020. Plans and Specifications may be viewed and/or obtained by going to the Advanced Reprographics website www.advancedrepro.net. Prospective bidders should access the "Planroom" on the website and go to the "Public Jobs" area, no log in information is necessary. Plans and specifications may be picked up at the Advanced Reprographics office. Plans and specifications may also be ordered by calling the Advanced Reprographics number listed above. Bidders are responsible for all printing costs and shipping costs, as applicable.

Form 818 Standard Specifications and Supplemental Specifications may be obtained via the Connecticut Department of Transportation's website: <https://portal.ct.gov/DOT/IT/ConnDOT-Publications-Manuals> All Proposals must be on the form furnished by the City of Bristol and must be requested for the above named project.

NOTE: Prospective bidders must have a current sworn Statement (CON-16) on file with the Connecticut Department of Transportation and be prequalified to perform Group No. 8 (Minor Bridges) work. The Bidder's Prequalification approval letter signed by the CTDOT Contracts Manager shall be included as part of the bid package submitted to the Municipality.

NOTE: A Surety Company Bond, on the form furnished by the City, for at least 30 percent of the amount of the bid must accompany each proposal. A certified check will not be accepted. The City reserves the right to reject any and all bids.

NOTE: **All bidders** shall submit the Pre-award DBE Commitment Approval Request form(s) to the City of Bristol **NO LATER THAN FIVE (5) calendar days after the bid opening.** This is a requirement of Title 49, Code of Federal Regulations (CFR) Part 26, Participation of DBEs.

CONTRACTORS that find discrepancies and/or errors in or between plans, specifications, quantities and other matters, must immediately notify Roger Rousseau, Purchasing Agent, in writing not less than ten days before the scheduled bid opening.

Date: April 3, 2024

City of Bristol

BID PROPOSAL DOCUMENTS

BID PROPOSAL DOCUMENTS
(Furnish to Prospective Bidders)

1. Bid Envelope (Sealed – with the following items in the envelope)
- 2.* Bid Proposal Form**
- 3.* Schedule of Prices ("Contract Time and Liquidated Damages" and "Prime Contractor's Requirements" are typed on last sheet) (Only furnished 11" x 17" form to be used)**
- 4.* Bid Bond (Must be on CTDOT form)**
- 5.* Affidavit of Non-Collusion**
- 6.* Bidder's Prequalification Approval Letter signed by the CTDOT Contracts Manager**
7. Employer Report of Permanent Compliance Staffing
8. Statement of Bidder's Qualifications

- Notes:**
- a. Bid envelope should be marked with the words "BID PROPOSAL" along with the appropriate City Bid Number/Title, State Project Number, your company name and address, time of bid opening, and date.
 - b.* Omission of any of Items 2, 3, 4, 5, or 6 from the contractor's submitted "bid proposal will result in rejection of a bid as nonresponsive."**

CITY OF BRISTOL
BID PROPOSAL FORM

Proposal of
(Name)

.....
(Address)

to furnish all labor, materials, tools and appliances, required to complete the construction of the Project described elsewhere herein.

Proposals will be received at the Purchasing Department, Bristol City Hall, Room 311, 111 North Main Street, Bristol, CT 06010 until the hour and date set in the "Advertisement for Proposals".

To the Purchasing Agent, City of Bristol, Connecticut.

Sir:

In accordance with the advertisement of the City of Bristol, Connecticut, inviting proposals for the construction of the Project hereinafter names, and in conformity with the plans and specifications on file in the office of Purchasing Department, City of Bristol, Connecticut.

I/We certify that I am/we are the only person or persons interested in this proposal as principals, that it is made without collusion with any person, firm, or corporation; that an examination has been made of the Specifications and Contract Form, including the "Special Provisions" contained herein, also of the plans and of the Site of Work, and I/we propose to furnish all necessary machinery, equipment, tools, labor and other means of construction, and to furnish all materials specified in the manner and at the time prescribed, all in accordance with the Contract and Specifications and in conformity with Plans and the requirements of the City of Bristol, Connecticut.

I/We agree to accept the prices set forth herein for any additions or deductions caused by variations in quantities due to more accurate measurements, or by any changes or alterations in the plans or specifications during the progress of the work.

I/We further proposed to execute the form of contract and begin work within ten days from the day of the "Notice to Proceed" and to prosecute said work so as to complete the project and its appurtenances within the time limit stipulated; and to furnish a 100% Performance Contract Bond in the required amount as security for the construction and completion of the Project and its appurtenances in accordance with Plans, Specifications and Contract, and a 100% Payment Bond for the payment for all materials or labor, used or employed in the execution of the Contract.

Accompanying this proposal is Surety Company Bond in the amount of
..... (\$.....),
as a proposal guarantee which it is understood will be forfeited in the event the Form of Contract is not executed if awarded to the undersigned.

Signed
(Sign and Print Legal name of person, firm or corporation)

Contact Info
(Email Address, Phone/Fax Number and Zip Code)

IMPORTANT – INSTRUCTIONS FOR SIGNATURE

1. If this BID PROPOSAL FORM is executed by an individual, it must be signed by the individual.
2. If executed by a Corporation, it must have the signature of a duly authorized officer or representative thereof, with his title, and the Corporate Seal, if any, must be affixed.
3. If executed by a partnership, the partnership name, if any, will be signed and each partner will sign as a co-partner, unless a power of attorney is attached authorizing one partner to execute the contract for all the partners.
4. If executed by an individual doing business under a trade name, it shall be signed by this individual doing a business as (as trade name).

**CITY OF BRISTOL
SCHEDULE OF PRICES
FOR THE CONSTRUCTION OF**

**STATE PROJECT NO. 0017-0192, FAP #6017(012)
CITY OF BRISTOL PROJECT 2C24-096
REPLACEMENT OF BRIDGE NO. 04487
EAST STREET OVER PEQUABUCK RIVER**

DATE OF
BID SUBMISSION

May 1, 2024

TIME: **10:00 AM**

NO BIDS WILL BE ACCEPTED AFTER 10:00 AM "NO EXCEPTIONS"

Note: --- The bidder shall fill in, under the column "Unit Prices Bid," the unit prices, written in words and in numbers, for which he proposes to perform the various items of work called for, and under the column headed "Amount," the amount of each of the items at the unit price bid. After the proposal is opened and read, the quantities will be extended and totaled in accordance with the written bid prices and the bid will be verified or corrected.

Item Number	Items	Unit	Approximate Quantities	Unit Prices Bid		Amount (Figures)
				Figures	Writing	
0020903A	LEAD COMPLIANCE FOR MISCELLANEOUS EXTERIOR TASKS	LS	1			
0201001	CLEARING AND GRUBBING	LS	1			
0202000	EARTH EXCAVATION	CY	345			
0202100	ROCK EXCAVATION	CY	10			
0202213A	REUSE OF EXISTING CHANNEL BOTTOM MATERIAL	CY	175			
0202315A	DISPOSAL OF CONTROLLED MATERIALS	TON	1125			
0202512	CUT CONCRETE SIDEWALK	LF	30			
0202529	CUT BITUMINOUS CONCRETE PAVEMENT	LF	290			
0202911A	CONDITION SURVEY (SITE NO. 1)	LS	1			
0203202	STRUCTURE EXCAVATION-EARTH (EXCLUDING COFFERDAM AND DEWATERING)	CY	865			
0203304	STRUCTURE EXCAVATION-ROCK (EXCLUDING COFFERDAM AND DEWATERING)	CY	221			
0204001	COFFERDAM AND DEWATERING	LF	540			
0209001	FORMATION OF SUBGRADE	SY	560			
0212000	SUBBASE	CY	190			
0213100	GRANULAR FILL	CY	6			
0216000	PERVIOUS STRUCTURE BACKFILL	CY	600			
0219001	SEDIMENTATION CONTROL SYSTEM	LF	100			
0219011A	SEDIMENT CONTROL SYSTEM AT CATCH BASIN	EA	3			
0286001.10	ROCK IN DRAINAGE TRENCH EXCAVATION 0' - 10' DEEP	CY	10			
0304002	PROCESSED AGGREGATE BASE	CY	100			
0406171	HMA S0.5	TON	179			
0406173	HMA S0.25	TON	25			
0406236	MATERIAL FOR TACK COAT	GAL	60			
0406303A	SAWING AND SEALING JOINTS	LF	155			
0503001A	REMOVAL OF SUPERSTRUCTURE	LS	1			
0509001	WELDED STUDS	EA	20			
0513003	1-1/2" POLYVINYL CHLORIDE PLASTIC PIPE	LF	35			
0514217	PRESTRESSED DECK UNITS (4'-0" x 1'-0")	LF	728			
0521021A	STEEL-LAMINATED ELASTOMERIC BEARINGS	CI	30000			
0586001.10	TYPE 'C' CATCH BASIN - 0' - 10' DEEP	EA	1			
0586040.10	TYPE 'C-L' CATCH BASIN - 0' - 10' DEEP	EA	1			
0586601	RESET TYPE 'C' CATCH BASIN	EA	1			
0586750	TYPE 'C' CATCH BASIN TOP	EA	1			
0601062	FOOTING CONCRETE	CY	153			
0601064	ABUTMENT AND WALL CONCRETE	CY	217			
0601066	COLUMN AND CAP CONCRETE	CY	54			
601091A	SIMULATED STONE MASONRY	SY	68			
0601118	BRIDGE DECK CONCRETE	CY	63			
0601121	PARAPET CONCRETE	LF	8			
0601122	BRIDGE SIDEWALK CONCRETE	CY	42			

Kindly insert here the total amount of your Bid \$ _____
It is understood that the unit prices shall govern in case of discrepancy between the unit-prices and this amount.
This bid includes addenda no.: _____

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Item Number	Items	Unit	Approximate Quantities	Unit Prices Bid		Amount (Figures)
				Figures	Writing	
0601123	APPROACH SLAB CONCRETE	CY	112			
0601124	BARRIER WALL CONCRETE	CY	29			
0601502	1/2" PREFORMED EXPANSION JOINT FILLER FOR BRIDGES	SF	240			
0601504	1" PREFORMED EXPANSION JOINT FILLER FOR BRIDGES	SF	295			
0602030	DEFORMED STEEL BARS - GALVANIZED	LB	87200			
0603801	STRUCTURAL STEEL	CWT	13			
0686000.15	15" R.C. PIPE (0'-10' DEEP)	LF	35			
0686000.24	24" R.C. PIPE (0'-10' DEEP)	LF	18			
0703011	INTERMEDIATE RIPRAP	CY	16			
0707009A	MEMBRANE WATERPROOFING (COLD LIQUID ELASTOMERIC)	SY	390			
0708001	DAMPPROOFING	SY	275			
0716000	TEMPORARY EARTH RETAINING SYSTEM	SF	4120			
0728032A	NO. 6 CRUSHED STONE	CY	13			
0755009	GEOTEXTILE	SY	35			
0811001	CONCRETE CURBING	LF	104			
0813001	5" GRANITE STONE CURBING	LF	34			
0813011	5" GRANITE CURVED STONE CURBING	LF	28			
0819002A	PENETRATING SEALER PROTECTIVE COMPOUND	SY	320			
0822100.01	TEMPORARY TRAFFIC BARRIER	LF	220			
0904990A	METAL BRIDGE RAIL	LF	179			
0921001	CONCRETE SIDEWALK	SF	1120			
0921005	CONCRETE SIDEWALK RAMP	SF	250			
0921048	DETECTABLE WARNING SURFACE	SF	50			
0922501	BITUMINOUS CONCRETE DRIVEWAY	SY	100			
0924006	CONCRETE DRIVEWAY RAMP	SF	860			
0943001	WATER FOR DUST CONTROL	M. GAL.	64			
0944000	FURNISHING AND PLACING TOPSOIL	SY	310			
0950005	TURF ESTABLISHMENT	SY	310			
0969060A	CONSTRUCTION FIELD OFFICE, SMALL	MO	9			
0970006	TRAFFICPERSON (MUNICIPAL POLICE OFFICER) (ESTIMATED COST)	EST	1	\$ 15,000.00	FIFTEEN THOUSAND DOLLARS	\$ 15,000.00
0971001A	MAINTENANCE AND PROTECTION OF TRAFFIC	LS	1			
0974001A	REMOVAL OF EXISTING MASONRY	CY	290			
0975004	MOBILIZATION AND PROJECT CLOSEOUT	LS	1			
0976002	BARRICADE WARNING LIGHTS - HIGH INTENSITY	DAY	2160			
0977001	TRAFFIC CONE	EA	20			
0978002	TRAFFIC DRUM	EA	20			
0979003	CONSTRUCTION BARRICADE TYPE III	EA	19			
0979004	CONSTRUCTION BARRICADE DETECTABLE	EA	4			
0980020	CONSTRUCTION SURVEYING	LS	1			
1014910	UTILITY RELOCATION	LS	1			

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Item Number	Items	Unit	Approximate Quantities	Unit Prices Bid		Amount (Figures)
				Figures	Writing	
1131002	REMOTE CONTROL CHANGEABLE MESSAGE SIGN	DAY	568			
1206023A	REMOVAL AND RELOCATION OF EXISTING SIGNS	LS	1			
1207041	SIGN FACE - EXTRUDED ALUMINUM (TYPE XI RETROREFLECTIVE SHEETING)	SF	20			
1210102	4" YELLOW EPOXY RESIN PAVEMENT MARKINGS	LF	470			
1210105	EPOXY RESIN PAVEMENT MARKINGS, SYMBOLS, AND LEGENDS	SF	209			
1220027A	CONSTRUCTION SIGNS	SF	308			
1301025	TEST PIPING SYSTEM (WATER MAIN)	LS	1			
1301770A	FURNISH AND INSTALL 8" WATER MAIN ON BRIDGE	LS	1			
1301861A	FURNISH DUCTILE IRON PIPE, VALVES, AND MISCELLANEOUS FITTINGS (WATER MAIN)	LS	1			

Kindly insert here the total amount of your Bid \$ _____
It is understood that the unit prices shall govern in case of discrepancy between the unit-prices and this amount.
This bid includes addenda no.: _____

**CITY OF BRISTOL
SCHEDULE OF PRICES
FOR THE CONSTRUCTION OF**

**STATE PROJECT NO. 0017-0192, FAP #6017(012)
CITY OF BRISTOL PROJECT 2C24-096
REPLACEMENT OF BRIDGE NO. 04487
EAST STREET OVER PEQUABUCK RIVER**

DATE OF
BID SUBMISSION

May 1, 2024

TIME: **10:00 AM**

NO BIDS WILL BE ACCEPTED AFTER 10:00 AM "NO EXCEPTIONS"

CONTRACT TIME AND LIQUIDATED DAMAGES

Two Hundred Forty-One (241) calendar days will be allowed for completion of all work as described in the contract documents for Federal Project No. 6017(012), State Project No. 0017-0192. For this contract, an assessment for liquidated damages at a rate of One Thousand Two Hundred Dollars (\$1,200) per calendar day shall be applied to each day the work runs in excess of the two hundred and forty-one (241) allowed calendar days.

Note: PRIME CONTRACTOR'S REQUIREMENTS:

A. Proposal Guaranty (Bid Bond): Except when otherwise specified, no proposal will be considered unless accompanied by a proposal guaranty in the form of a bond furnished by a surety company, satisfactory to the Engineer, in an amount equal to at least 30% of the amount of the bid, or unless the bidder has on file in the City, an annual bid bond in the proper amount.

The surety must be a corporate surety licensed to sign surety bonds in the State of Connecticut.

B. Not less than 13% of the total Contract value shall be subcontracted to, performed by, and paid to DBE.

C.

If the Contractor is unable to fulfill the DBE's percentage requirement, he may request an exception of the above percentage, by completing and submitting to the City, the "Application for Review of Pre-award Good Faith Efforts", as contained in the General Provisions.

D. Contractors must make sure that at the time of bidding, their Firms have an approved Affirmative Action Plan with the State of Connecticut, Department of Transportation.

E. Statement of Bidder's Qualifications: Each bidder is required to submit to the City a recent sworn statement of the bidder's qualifications the form furnished by the City for this purpose.

F. Prospective bidders must have a current sworn Statement (CON-16) on file with the Connecticut Department of Transportation and be prequalified to perform Group No. 8 (Minor Bridges) work. The Bidder's Prequalification approval letter signed by the CTDOT Contracts Manager shall be included as part of the bid package submitted to the Municipality.

G. Contracts will not be awarded until the above requirements have been submitted and approved.

H. Please be aware that the City, prior to the awarding of the Contract, may require further financial and other information from any applicant who becomes the low bidder for that Contract.

I. All Bidders shall submit the Pre-award DBE Commitment Approval Request form(s) to the City of Bristol NO LATER THAN FIVE (5) calendar days after the bid opening. This is a requirement of Title 49, Code of Federal Regulations (CFR) Part 26, Participation of DBEs Failure to comply with this requirement may be cause for rejection of the bid.

Kindly insert here the total amount of your Bid \$ _____
It is understood that the unit prices shall govern in case of discrepancy
between the unit-prices and this amount
This bid includes addenda no.: _____

NAME OF PRINCIPAL

(Contractor, Second Party, Etc.):

CITY OF BRISTOL

State Project No. 0017-0192
City of Bristol Project 2C24-096

STANDARD BID BOND

KNOW ALL PERSONS BY THESE PRESENTS:

That We,
of
hereinafter called the "Principal", as Principal, and
.....
a corporation organized and existing under the laws of the State of
and duly authorized to transact a surety business in the State of Connecticut, hereinafter called the "Surety," as Surety,
are held and firmly bound unto the City of Bristol, as "Obligee," in the penal sum of **THIRTY PERCENT (30%) OF
THE AMOUNT OF THE ATTACHED BID** in lawful money of the United States of America, for the payment of
which, well and truly to be made to the Obligee, we bind ourselves, our heirs, successors, and assigns, jointly and
severally, firmly by these presents.

Signed, sealed and delivered this day of....., 20.....

THE CONDITION OF THIS OBLIGATION is such, that whereas the said Principal has herewith submitted, his bid
dated 20___, for
.....
.....
.....
.....
.....

NOW, THEREFORE, if the Principal shall not withdraw its bid within sixty (60) days after the opening of the same,
and if said bid shall be accepted and the contract awarded to said Principal, and the Principal shall, when required by
the, or his authorized agent, execute and agreement in writing for the
work bid upon, and deliver such surety bonds as shall be acceptable to said
for the performance of the work according to said written agreement and for the protection of person supplying labor or
materials in the prosecution of said work, and shall in all other respects perform the agreement created by the acceptance
of said bid, then this obligation shall be void; otherwise the Principal and Surety hereto agree to pay unto the Obligee
the difference between the amount of the bid of said Principal, submitted herewith, and the amount for which the Obligee
may contract with another party to perform the work covered by the said bid of the Principal.

The Surety executing this Instrument hereby agrees that its obligation shall not be impaired by any extension(s) of the
time for acceptance of the bid that the Principal may grant to the Obligee, notice of which extension(s) the Surety being
hereby waived; provided that such waiver of notice shall apply only with respect to extensions aggregating not more
than sixty (60) calendar days in addition to the period originally allowed for acceptance of the bid.

IN TESTIMONY WHEREOF, the said
.....
have caused these presents to be signed by their duly authorized representatives and their name and corporate seal to be
hereunto affixed, the day and year first written.

SURETY

PRINCIPAL

Print Name

Print Name

Agent's Signature and date
enclose valid Power of Attorney

Signature and date of Authorized Representative

NON COLLUSION AFFIDAVIT

This Affidavit must be completed, notarized and attached to your Bid Proposal. Failure to do so will result in the rejection of your Bid. A separate Affidavit must be submitted by each principal of a Joint Venture.

State Project No. 0017-0192

F.A.P. # 6017(012)

City of Bristol Project 2C24-096

City of Bristol

Description of Project: Replacement of Bridge No. 04487, East Street over Pequabuck River.

I, _____, acting in behalf of _____
(Name of Party Signing Affidavit)

_____ of which
(person, firm, association, corporation or organization)

I am the _____, submitting a bid for the above project, certify
(Title of Person)

and affirm in accordance with Section 112(c) of Title 23, U.S. Code Highways that the _____
(person, firm, association, corporation or organization)

has neither directly or indirectly entered into any agreements, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with such bid. False statements made herein may be the subject of criminal prosecution.

Name of Corporation or Firm

Signature and 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 _____

Secretary 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 corporate powers.

(Corporate Seal)

Signature of Person Certifying



**STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION**

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

Phone: 860-594-3128



October 26, 2018

ABC Construction
Mr. Doe
123 Main St.
Santa Clara, Connecticut 06000

Re: Contractor's Prequalification
Statement (CON-16)

Dear Mr. Doe;

This is to notify you that your Firm's subject statement has been found to be satisfactory by this Department.

It will expire August 31, 2021

Your Maximum Capacity Rating is \$60,000,000.00

Your Construction Classification is:

Group No. 1 Earthwork: Site Work

Group No. 2 Earthwork: Utility Work

Group No. 3 Concrete Restoration

Group No. 4 Specialized Concrete Repair

Group No. 5 Paving and Associated Construction

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

Group No. 7 Road Construction and Rehabilitation: Limited Access Highways, freeways, and major reconstruction of non-freeway state routes.

Group No. 8 Minor Bridges

Group No. 9 Intermediate Bridges

Group No. 10 Major Bridges

Group No. 11 Bridge Painting

Group No. 12 Marine repairs, Marine Construction or Salvaging

Group No. 13 Traffic Control & Illumination/Electrical

Group No. 14 Signing Delineation

Group No. 15 Intelligent Transportation Systems (ITS)
Group No. 16 Pavement Markings
Group No. 17 Incidental Construction: Fencing
Group No. 18 Incidental Construction: Guide Rail
Group No. 19 Incidental Construction: Bridge Joints & Membranes
Group No. 20 Incidental Construction: Temporary Traffic Control
Group No. 21 Railroad Construction
Group No. 22 Railroad Construction Electrical
Group No. 23 Landscaping/Environmental Improvements
Group No. 24 Environmental
Group No. 25A Vertical Construction
Group No. 25B Vertical Construction Includes Group 25 A
Group No. 25C Vertical Construction Includes Groups 25 A & B

A Proposal Request (Part "C") can be obtained via this link:
<http://www.ct.gov/dot/lib/dot/documents/dcontractdev/partc.xls>

No bidders that have mutual financial interests, or common ownership, directors, officers or principal shareholders (i.e., shareholders holding at least five percent [5%] of either the common or the preferred shares of the company's stock) may bid for the same Department contract. Such proscribed bidders shall include, but not be limited to, affiliates and subsidiaries of each other.

If any non-bidding party has an ownership interest in more than one bidder that is bidding for a given contract, either directly or through the former's ownership interests in another company, no matter how high up or far removed in a vertical or horizontal chain of ownership that party might be from the bidders, the bids of those bidders shall not be accepted.

In addition, with respect to any given Department contract that is advertised for bidding, no bidder owned by, or in the chain of ownership of, a company which provides surety bonds may bid against a bidder for whom a bond has been or will be provided by that company for the given contract bidding. All bids proscribed by the terms of this paragraph will be rejected by the Commissioner.

Please be aware that the Department, prior to the awarding of any contract, may require further financial and other information from any applicant who becomes the low bidder for that contract.

If you have any questions, please do not hesitate to contact me.

Sincerely,

Gregory D. Straka

Gregory D. Straka
Contracts Manager
Division of Contracts Administration

STATEMENT OF BIDDER'S QUALIFICATIONS

CITY OF BRISTOL

STATE PROJECT NO. 0017-0193
CITY OF BRISTOL PROJECT 2C24-096

All bidders are required to file this form, properly completed, WITH THEIR PROPOSAL. Failure of a bidder to answer any question or provide required information may be grounds for the awarding authority to disqualify and reject their bid. If a question or request for information does not pertain to your organization in any way, use the symbol "NA" (Not Applicable). Use additional 8½" x 11" sheets with your letterhead as necessary.

1. Indicate exactly the name by which this organization is known:

Name _____

2. How many years has this organization been in business under its present business name?

Years _____

3. How many years has this organization been in business as a General Contractor?

Years _____

1. If this organization has not always been a General Contractor, list the trade(s) that your firm customarily performed prior to the time that you became a General Contractor:

1. _____

2. _____

3. _____

2. Indicate all other names by which this organization has been known and the length of time known by each name:

1. _____

2. _____

3. _____

3. This firm is a _____ Corporation _____ Partnership _____ Sole Proprietorship
_____ Joint Venture _____ Other.

4. Attach resumes of all supervisory personnel, such as Principals, Project Managers, and Superintendents, who will be directly involved with projects on which you are now a bidder. Indicate the number of years of construction experience and number of years of which they were in a supervisory capacity.

5. List all sub-trades which your firm customarily performs with own employees.
 1. _____
 2. _____
 3. _____

6. Trade References: Names, addresses and telephone numbers of several firms with whom your organization has regular business dealings.

(Attach separate sheet)

10. All Construction Projects Your Organization has in Process:

TITLE & LOCATION	CONTR. AMOUNT	PRIME* OR SUB-CONTRACTOR	OWNER	DESIGNER	START DATE	FINISH DATE	ANY COMPLAINT AS TO QUALITY OR MANAGEMENT	NAME & PHONE OF OWNER'S REP	NAME & PHONE OF DESIGNER REP

Firm Name: _____

_____ Please attach a separate sheet explaining any negative entry in these three columns

Notes: Indicate "Prime" only if your organization performed 51% or greater of the total contract amount.

11. All Construction Projects Your Organization has completed in the past five years or the twenty projects most recently completed:

TITLE & LOCATION	CONTR. AMOUNT	PRIME* OR SUB-CONTRACTOR	OWNER	DESIGNER	START DATE	FINISH DATE	ANY COMPLAINT AS TO QUALITY OR MANAGEMENT	NAME & PHONE OF OWNER'S REP	NAME & PHONE OF DESIGNER REP

Firm Name: _____

Please attach a separate sheet explaining any negative entry in these three columns

Notes: Indicate "Prime" only if your organization performed 51% or greater of the total contract amount.

12. Has your organization ever failed or has any officer or partner of your organization ever been an officer or partner of another organization that failed to complete a contract in any jurisdiction. If so, indicate the circumstances leading to the project failure.

13. List all legal or administrative proceedings currently pending or concluded adversely within the last five years which relate to procurement or performance of any public or private construction contracts in any jurisdiction.

1. _____ Attached 2. _____ N/A

Dated at _____
this _____ day of _____ 20_____.

Name of Organization:

Signature _____ (Seal)

(Print Name) _____

Title _____

Notary Statement:

Mr./Mrs./Ms. _____ being duly

sworn deposes and says that he/she is the _____
(Position or Title)

of _____, and that the answers to the foregoing questions and all statements therein
(Firm Name)

contained are true and correct.

Subscribed and sworn before me this _____ day of _____
_____ 20_____.

Notary Public: _____

My Commission Expires _____ 20_____

**CITY OF BRISTOL
CONNECTICUT**

**CONTRACT DOCUMENTS
FOR THE
REPLACEMENT OF BRIDGE NO. 04487**

EAST STREET OVER PEQUABUCK RIVER

**STATE PROJECT NO. 017-0192
FEDERAL AID PROJECT NO. 6017 (012)
CITY OF BRISTOL PROJECT NO. 2C24-096
APRIL 03, 2024**

Mayor
Jeffrey Caggiano

Director of Public Works
Raymond Rogozinski, P.E.

City Engineer
Nancy Levesque, P.E.

Consultant Design Engineer
GM2 Associates, Inc.
115 Glastonbury Boulevard, Glastonbury, CT 06033

Consultant Liaison Engineer
BL Companies
100 Constitution Plaza, 10th Floor, Hartford, CT 06103

INDEX TO SPECIAL PROVISIONS

Note: This index 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 index shall not be considered part of the contract.

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APRIL 03, 2024
FEDERAL PROJECT NO. 6017(012)
STATE PROJECT NO. 0017-0192

REPLACEMENT OF BRIDGE NO. 04487
EAST STREET OVER PEQUABUCK RIVER

City of Bristol
Federal Aid Project No. 6017(012)

The State of Connecticut, Department of Transportation, Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 818, 2020, as revised by the Supplemental Specifications dated July 2023, (otherwise referred to collectively as “Form 818”) is hereby made part of this contract, as modified by the Special Provisions contained herein. Form 818 is available at the following DOT website link <https://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 <https://www.ct.gov/dot/cwp/view.asp?a=2288&q=259258>. The Special Provisions relate in particular to the Replacement of Bridge No. 04487 in the City of Bristol.

CONTRACT TIME AND LIQUIDATED DAMAGES

Two Hundred Forty-One (241) calendar days will be allowed for completion of all work as described in the contract documents for Federal Project No. 6017(012), State Project No. 0017-0192. For this contract, an assessment for liquidated damages at a rate of One Thousand Two Hundred Dollars (\$1,200) per calendar day shall be applied to each day the work runs in excess of the two hundred and forty-one (241) allowed calendar days.

NOTICE TO CONTRACTOR – CONTRACT DURATION

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

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

The following Federal Wage Determinations are applicable to this Federal- Aid contract and are hereby incorporated by reference. During the bid advertisement period, it is the bidder’s responsibility to obtain the latest Federal wage rates from the US Department of Labor website,

as may be revised 10 days prior to bid opening. Any revisions posted 10 days prior to the bid opening shall be the wage determinations assigned to this contract.

Check Applicable WD# (DOT Use Only)	WD#	Construction Type	Counties
	CT1	Highway	Fairfield, Litchfield, Middlesex, New Haven, Tolland, Windham
	CT2	Highway	New London
X	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 – HAZARDOUS MATERIALS INVESTIGATIONS

Limited hazardous materials site investigations have been conducted at Bridge Number. 04488 – Mellen Street Bridge and Bridge Number 04487 – East Street Bridge over the Pequabuck River in Bristol, Connecticut.

Results of the survey identified lead-containing paint present on both the Mellen Street Bridge and the East Street Bridge railings and the Mellen Street deck support girders.

Results of the survey also identified ACMs within black tar adjacent to the deck/abutment connection bituminous sheeting (MS-2), in addition to rail base caulking (NP3) for the Mellen Street bridge. ACMs were not identified at the East Street Bridge.

Results obtained from TCLP waste stream sampling and analysis for leachable lead from the paint on the bridge girders and railings, characterized that paint waste stream as **hazardous waste** as the TCLP concentrations are above 5.0 mg/l. Any paint generated/not disposed of as part of steel recycling will have to be disposed of as **hazardous waste**.

Additionally, base rail caulking collected at the Mellen Street bridge (NP3) exceeded 5.0 mg/l leachable lead and reported asbestos (8% chrysotile) and thus should be classified as a **combined waste**.

PCBs were identified within rail base caulking (NP3 – 0.25 mg/kg) but were significantly below the EPA action limit of 50 mg/kg and are considered non-hazardous.

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.

No bird/pigeon guano accumulations or bloodborne pathogens (BBP) concerns were observed in accessible areas of either bridges. The paint covering the railings of both bridges was found to be hazardous (exceeds TCLP) but is not likely to affect pedestrians if the railing is used as intended.

The Contractor is hereby notified that these lead, asbestos, and PCB containing 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 Municipality, 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

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

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

- Task 710A/710L: Environmental Report – Replacement of East Street Bridge No. 04487 over Pequabuck River, Bristol, Connecticut – CT DOT Project No. 017-192

NOTICE TO CONTRACTOR – MANAGEMENT OF SURPLUS SOIL

Environmental soil investigations were not conducted for State Project 0017-0192 - Bridge No. 04487 carrying East Street over Pequabuck River. The following provides guidance regarding proper management and final disposition of excavated soils within the Project Limits. This guidance is provided to facilitate reuse of suitable soils where possible, and to facilitate the disposal of unsuitable or surplus material if/when warranted.

While no specific pre-characterization investigations have been conducted, it is anticipated that excavated project soils may contain low levels of various constituents of concern indicative of typical roadway background conditions, notably polycyclic aromatic hydrocarbons (PAHs), petroleum hydrocarbons, and/or metals (e.g., lead). However, in general, the levels of constituents are expected to be below the Connecticut Department of Energy and Environmental Protection (CTDEEP) Remediation Standard Regulations (RSRs) criteria. Therefore, when possible, all suitable excavated materials shall be re-used within the project limits prior to the use of other soils and/or fill unless otherwise designated by the Department's environmental consultant and Engineer, and 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 restrict reuse; and (4) such soil is not placed in an area subject to erosion.

As directed by the Engineer, excavated material that is suitable for reuse shall be managed at the point of origin for use as backfill. In instances where such material cannot be reused directly at the point of origin or within several days of excavation, said material excluding existing pavement structure (asphalt and subbase), rock, ledge, and concrete, shall be transported to a suitable onsite Project stockpile location, and managed as typical construction material until such a time that it can be reused. Material deemed excess or unsuitable, shall be transported to a designated onsite Project stockpile area, segregated from other material(s), and managed in accordance with standard erosion and sedimentation controls (hay bales and polyethylene sheeting) for waste characterization sampling. At the time of Project completion, all remaining surplus or unsuitable materials from each headquarters locations will require characterization for off-site disposal at a Department-approved treatment/recycling/disposal facility

In the event groundwater is encountered during construction, any dewatering associated with the construction shall be performed in accordance with the CTDEEP's "General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities." The Section which shall be reviewed by the Contractor include, but are not limited to, the following:

- Item No. 0202315A – Disposal of Controlled Materials

The Contractor is alerted to the fact that the Department's environmental consultant will be on site for excavation activities within the Project Limits, to collect soil samples (if necessary) and to observe site conditions for the Department.

NOTICE TO CONTRACTOR – VERIFICATION OF PLAN DIMENSIONS AND FIELD MEASUREMENTS

The Contractor is responsible for verifying all dimensions before any work is begun. The 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 noted on the drawings submitted for approval.

There shall be no claim made against the City of Bristol 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 – 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 – REVISIONS TO SECTION 1.06 – CONTROL OF MATERIALS AND ANTICIPATED SOURCE OF SUPPLY FORM (CON-083)

The Contractor is hereby notified that Section 1.06 Control of Materials, included in the January 2023 Supplements has been revised.

The revisions include a clarification to the **Buy America Act (BAA)** requirements and new requirements for the **Build America, Buy America Act (BABA)**.

Note that the **Build America, Buy America Act (BABA)** does not supersede BAA with regard to the iron and steel requirement, however it expands the requirements to include manufactured products and construction materials. Such products and materials (with exceptions) incorporated into projects “must be produced in the United States.”

BABA requires that all construction materials are manufactured in the United States. Construction materials include those listed on the Anticipated Source of Material (CON-083) Form, which has also been revised to address the BABA requirements.

NOTICE TO CONTRACTOR – STANDARD DRAWINGS

Bidders are hereby notified that the standard drawings (if any) referenced on the plans for this Project are available on the State of Connecticut Department of Transportation's website.

NOTICE TO CONTRACTOR – PREQUALIFICATION REQUIREMENT

Prospective bidders must have a current sworn Statement (CON-16) on file with the Connecticut Department of Transportation and be prequalified to perform Group No. 8 (Minor Bridges) work. The CON-16 shall be included as part of the bid package submitted to the Municipality.

NOTICE TO CONTRACTOR - BID REJECTION

Bidders are hereby notified that until the award of the Contract, the Municipality reserves the right to reject any or all bids for any reason whatsoever, and to waive technicalities as deemed to be in the best interests of the Municipality.

NOTICE TO CONTRACTOR – PRE-AWARD DOCUMENTS/ NON-RESPONSIVE BIDDER

All bidders shall submit the Pre-award DBE Commitment Approval Request form(s) to the City of Bristol NO LATER THAN FIVE (5) CALENDAR DAYS AFTER THE BID OPENING. This is a requirement of Title 49, Code of Federal Regulations (CFR) Part 26, Participation of DBEs.

Bidders are hereby notified that all other required pre-award submittals, properly executed on the forms provided by the Municipality shall be furnished to the Municipality NO LATER THAN FOURTEEN (14) CALENDAR DAYS AFTER THE BID OPENING. These documents include but are not limited to: Contractor's Proposed Progress Chart; Anticipated Source of Materials; Statement of Bidders Qualifications.

The Municipality may reject a bid as non-responsive if the bidder does not make all required pre-award submittals within the herein stipulated calendar days.

NOTICE TO CONTRACTOR – TRANSMITTAL OF APPROVED DRAWINGS

The Contractor is hereby notified that, upon receipt of any and all approved shop drawings, and working drawings for permanent construction, the Contractor shall transmit one set of such approved drawings and product data to the Municipality, the oversight Construction District, the Construction Inspector and the Connecticut Department of Transportation, Office of Research and Materials, Division of Materials Testing:

City of Bristol

Attn: Nancy Levesque, P.E.
City Engineer
111 North Main Street
Bristol, CT 06010
(860) 584-6105

Connecticut Department of Transportation

District 1 Construction Office
Attn: Donald L. Ward, P.E.
District Engineer
1107 Cromwell Avenue
Rocky Hill, CT 06067
(860) 258 4603

GM2 Associates, Inc.
Attn: Paul Brand
Project Manager
115 Glastonbury Blvd.
Glastonbury, CT 06033
(860) 659-1416

Connecticut Department of Transportation
Office of Research and Materials - Division of Materials Testing
Attn: Eliana V. Carlson
280 West Street
Rocky Hill, Connecticut 06067
(860) 258-0312

NOTICE TO CONTRACTOR – ADDITIONAL WORK FOR REVIEW OF CONTRACTOR SUBMITTALS

The Contractor shall reimburse the City for expenses due to additional work performed by the City's consultants, while reviewing and evaluating Contractor's proposed substitutions (whether or not the substitutions are accepted). Additional Work shall be as determined by the City and shall be understood as work in excess of what is typical or usual for engineering review of shop drawings, working drawings, calculations, load ratings, erection or handling water schemes, samples of products and systems specified in the Contract Documents, etc. This additional Work shall include, but not be limited to, change in product or system specified; evaluation that requires cost estimates and/or consultation; engineering, redesign, travel; reviews of multiple submittals (more than two) for the same structural element or construction operation; and review of more than one product or system for the same work. Through deductions in the contractor's payments, the Contractor shall reimburse the City for expenses due to additional Work performed by its consultants at the consultant's standard hourly or daily rates, while reviewing and evaluating Contractor's proposed substitutions.

NOTICE TO CONTRACTOR - INSURANCE

The insurance industry's standard ACORD Certificate of Liability Insurance will replace the CON-32 Form. All required levels (\$) of insurance coverage governed by the Connecticut DOT's Standard Specifications (Form 818) Section 1.03.07, or as amended by special provision, shall be identified on the ACORD Form.

The ACORD Form shall identify the Municipality, with its official address, as the certificate holder. The project description together with the State Project number shall be included under "Description of Operations". The Municipality, the State, and affected property owner listed below shall be named as additional insured, as required in Section 1.03.07.

Kevin Sawe (dba Sawe's Automotive Service)
9 East Street

Bristol, CT 06010

NOTICE TO CONTRACTOR – SUPERVISION AND INSPECTION

This project will be supervised and inspected by the Municipality or its authorized agent. The "Notice to Proceed", stipulating the date on which the Contractor will begin the construction and from which date the contract time will be charged, will be issued by the Municipality.

NOTICE TO CONTRACTOR – MUNICIPAL PROJECT/FIELD OFFICE

Bidders are hereby notified that this is a Municipal project. As such the construction field office requires the approval of the Municipality's electrical inspector instead of the State's CT DOT electrical inspector. Additionally, the installation of a data communication circuit between the field office and the CT DOT Data Communications Center in Newington will not be required.

NOTICE TO CONTRACTOR – APPROVALS AND INSPECTION BY THE STATE

The Contractor is hereby notified that pursuant to an Agreement between the State and the Municipality for the construction, inspection and maintenance of this project, the Municipality is required to obtain written approvals from the State of Connecticut Department of Transportation for the following contract administration matters prior to the Municipality giving its approval to the Contractor:

- Award and Execution of Contract
- Changes in Scope of Work including Extra Work and Value Engineering Proposals
- Extensions of Contract Time

The Contractor is also hereby notified that pursuant to the aforementioned Agreement, the Department will provide certain services, including, but not limited to, materials testing, periodic construction inspection, and liaison services with other governmental agencies to ensure satisfactory adherence to state and federal requirements for this project.

NOTICE TO CONTRACTOR – UTILITY SPECIFICATIONS

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

NOTICE TO CONTRACTOR – UTILITY COMPANIES

It is understood that any references in the contract documents to Northeast Utilities, CL&P and/or Yankee Gas are meant to refer to Eversource.

It is understood that any references in the contract documents to AT&T is meant to refer to Frontier Communications.

NOTICE TO CONTRACTOR – PROTECTION OF EXISTING UTILITIES

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

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

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.

In order to notify utility companies, the number 1-800-922-4455 (Call Before You Dig), in accordance with Sections 16-345 through 16-359 of the Public Utilities Regulatory Authority (PURA) state statutes, must be called at least two (2) full working days prior to the start of excavation. This notification will enable the utility companies to mark out their facilities in the field.

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.

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

During the excavation for the proposed improvements, the cover over the existing underground Utilities will be reduced. Therefore, the Contractor shall have the location of the underground Utilities marked out prior to and following the excavation. The Contractor's attention is directed to the requirements of Article 1.07.13-Contractor's Responsibility for Adjacent Property, Facilities and Services.

Prior to opening an excavation, effort shall be made to determine whether underground installations, i.e., sewer, fuel, electric line, etc., will be encountered and, if so, where such underground installations are located. When the excavation approaches the estimated location of such 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.

The Contractor shall perform all work in such a manner that will protect each Utility Company's facilities from damage. This may include excavation by hand methods as well as modified compaction methods when working close to underground Utilities. The Contractor is responsible for coordinating their work with each utility sufficiently in advance of the work so that the utility can schedule their work crews.

NOTICE TO CONTRACTOR – PERMITS/PERMIT APPLICATIONS

The Contractor is hereby notified that all permit approvals and permit applications (contained elsewhere in these specifications) shall be made a part of this Contract, and that the Contractor shall be bound to comply with all requirements of such permits and permit applications as though the Contractor were the permittee. If at the time the permit is received its contents differ from that which is outlined in the application, the permit shall govern.

Should the permit be received after the receipt of bids and the permit requirements significantly change the character of the work, adjustment will be made to the contract in accordance with the appropriate articles in Section 1.04. The requirements and conditions set forth in the permit and permit application shall be binding on the Contractor just as any other specification would be. In the case of a conflict between a provision of the environmental permit or permit application and another provision in the contract documents, the former shall govern.

NOTICE TO CONTRACTOR – CONSTRUCTION SIGNS

The Contractor shall furnish, install, and maintain Bipartisan Infrastructure Law project signs for the duration of the Contract. The Contractor shall also remove the signs upon completion of the work under the project. A special provision for these signs has been added to the Contract for Item No. 1220027A - Construction Signs.

NOTICE TO CONTRACTOR – GEOTECHNICAL EVALUATION REPORT

The Geotechnical Evaluation Report for Bridge No. 04487 is enclosed for use by the contractor. These plans are provided for informational purposes only.

NOTICE TO CONTRACTOR – RECORD BRIDGE PLANS

The Existing Record Bridge Plans for Bridge No. 04487 are enclosed for use by the contractor. These plans are provided for informational purposes only.

SECTION 1.01 – DEFINITIONS OF TERMS AND PERMISSIBLE ABBREVIATIONS

1.01.01—Definitions: is amended and supplemented as follows:

Substitute the word "Municipality" or "Municipal" for "Department" wherever "Department" appears in the definitions for each of the following terms: Award, Contract, Highway, Plans, and Project.

Substitute the word "Engineer" for "Commissioner" wherever "Commissioner" appears in the definitions for each of the following terms: Subcontractor and Sub-subcontractor.

Engineer: Delete the definition in its entirety and replace with the following:

The Municipality's Director of Public Works, acting directly or through a duly authorized representative.

Add the following:

Municipal: Of or relating to the Municipality.

Municipal Liaison: That individual identified by the Municipality to act as liaison with the State of Connecticut, Department of Transportation.

Municipality: City of Bristol, Connecticut

SECTION 1.02 – PROPOSAL REQUIREMENTS AND CONDITIONS

Section 1.02 is supplemented and amended as follows:

Throughout this Section, make the following substitutions for all occurrences of the word(s) identified below for substitution:

Substitute "Engineer" for "Commissioner" and for "Division of Contracts."

Substitute "Municipality" or "Municipal" for "Department" and for "Contract Section".

1.02.01—Contract Bidding and Award: is amended as follows:

Add the following two (2) paragraphs to the end of the existing paragraph.

Should the Municipality NOT allow electronically submitted bids, then each paper bid proposal must be submitted in a sealed envelope large enough to hold the proposal documents (recommended size 10-1/2 x 13). **The envelope must clearly state the name and address of the firm submitting the bid, the name of the City and Project Number for the bid.** The envelope must be delivered to the Municipality on or before the hour and date, and to the location, set forth in the bid advertisement for the opening of proposals, unless the bidder is otherwise directed.

On the date and at the time and place designated in the bid advertisement and in the related Notice to Contractors or addendum notice, the sealed paper bid proposals shall be publicly opened and read out loud. At the time that paper bid proposal is opened, it shall be checked for "responsiveness" in various respects, to determine if it complies with applicable statutes, regulations, and the Municipality's Specifications, including Connecticut DOT's Standard Specifications. Each bidder is required to include with its paper bid proposal the following documents: the completed paper bid proposal form (incl. the schedule of prices), the required bid bond, a non-collusion affidavit, and any other information required by the bid documents or by the bid advertisement. Each paper bid proposal shall be governed by the terms and conditions, as applicable, that are stipulated in the Connecticut DOT's Construction Bidding and Award Manual, for electronically submitted bids.

Add the sentence below following the end of the last paragraph;

In accordance with the provisions of the Construction Contract Bidding and Award Manual, bidders must be prequalified for Group No. 8 – Minor Bridges, to be eligible to bid on this project. Bidders that are not prequalified for this work classification will not be approved to bid on this project.

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

Delete the last paragraph and replace with the following:

"Bidders must inform the Municipality, at the earliest opportunity, in writing, of any and all omissions, errors, and/or discrepancies that the bidder discovers within or among the plans, specifications, and bidding documents. Information and inquiries concerning such matters, and any other information or inquiry concerning the conditions of bidding or award or the interpretation of contract documents must be transmitted in writing to:

Roger D. Rousseau
Purchasing Agent
City of Bristol Purchasing Department
111 North Main Street
Bristol, CT 06010

The Municipality and/or the Municipality's Designer cannot ensure a response to inquiries received later than ten (10) days prior to the scheduled bid opening of the related bid. When deemed warranted by the Municipality and/or the Municipality's Designer, responses to such inquiries that relate to changes in or interpretations of the Project documents (plans and specifications) will be issued to all bidders in the form of addenda and made a part of the Contract. Bidders are responsible for ensuring that they are aware of all addenda. Failure by the Municipality, Municipality's Designer or postal or other courier services to deliver addenda or other information regarding a Contract being bid does not release the bidder from any obligations under said addenda or the conditions of the bid."

SECTION 1.03 – AWARD AND EXECUTION OF CONTRACT

Section 1.03 is supplemented and amended as follows:

Throughout this Section, except for Article 1.03.07, make the following substitutions for all occurrences of the word(s) identified below for substitution:

Substitute "Engineer" for "Commissioner".

Substitute "Municipality" for "Department" and "State".

1.03.07—Insurance: is amended as follows:

Substitute "State and Municipality" for "Department" and "State".

It is the intent of this Article to designate the State and Municipality as additional insured, as applicable.

Article 1.03.08 - Notice to Proceed and Commencement of Work:

Add the following paragraph at the end of section:

If the Notice to Proceed occurs during a winter shutdown period the Contractor shall not begin physical Project construction prior to April 1, 2024. The Contractor can proceed with preparation of Shop and Working drawings and Material Procurement during the winter shutdown period.

SECTION 1.04 – SCOPE OF WORK

Section 1.04 is supplemented and amended as follows:

Throughout this Section, make the following substitutions for all occurrences of the word(s) identified below for substitution:

Substitute "Engineer" for "Department's Assistant District Engineer".

Substitute "Municipality" for "Department" and for "State".

1.04.05 – Extra Work: is amended as follows:

Add the following after the fourth sentence:

Bonding costs shall not be included in the contractor's compensation request. However, if the contractor incurs or will incur increased bonding costs related to the extra work, the contractor shall request separate compensation for such costs. The contractor's request shall be itemized and include a certified statement from the bonding company stating that the value of the work will require an increase in bonding coverage and shall detail the additional costs (within allowable contract amount limitations). If *satisfactory* substantiation is provided, a new item for increased bonding costs will be incorporated into the contract by means of a construction order.

Insert the following immediately following "Department's Assistant District Engineer" near the bottom of the paragraph: "and/or the Municipality's authorized representative".

SECTION 1.05 – CONTROL OF THE WORK

Section 1.05 is supplemented and amended as follows:

Substitute "Municipality" for "Department" and/or "State" and "Engineer" for "Department's Assistant District Engineer".

1.05.02-1. Plans: Substitute "Municipality" for "Department".

Add the following sentence to the end of the Subarticle: "The Working Drawings, Shop Drawings and Product Data shall be submitted to the Designer as hereinafter noted; copies of transmittal letters shall be sent to the oversight District and the Municipality.

Designer

Paul Brand
Project Manager
GM2 Associates, Inc.
115 Glastonbury Blvd.
Glastonbury, CT 06033
(860) 659-1416

Oversight District

Donald L. Ward, P.E.
District Engineer – District 1
1107 Cromwell Avenue
Rocky Hill, CT 06067
(860) 258 4603

Municipality

Nancy Levesque, P.E.
City Engineer
City of Bristol
111 North Main Street
Bristol, CT 06010
(860) 584-6105

1.05.02-2. Working Drawings: Substitute "Municipality" for "Assistant District Engineer".

1.05.02-5. Submittal Preparation and Processing – Review Timeframes: Substitute "Designer" for "Department".

Add the following paragraphs:

"Prior to the submission of any working, shop or erection drawings, the Contractor shall prepare and submit to the Engineer, for approval, a schedule for all proposed working and shop drawings. This initial schedule should be submitted within thirty (30) days of contract award and must be submitted before the Notice to Proceed. The Contractor shall coordinate, schedule and control all submittals of working and shop drawings including those of his various subcontractors, suppliers and engineers to provide for an orderly and balanced distribution of the work.

Each Shop Drawing shall include the name and telephone number of the fabricator's contact person who is familiar with the drawing and who will be available to answer questions by the Engineer or Designer should any arise during the review process.

It is incumbent upon the Contractor to submit his shop drawings in accordance with the approved working and shop drawing schedule to facilitate expeditious review. Voluminous submittals of shop drawings at one time are discouraged and may result in increased review time. In no case will the Municipality accept liability for resulting delays, added costs and related damages when the time required for approval extends beyond the approximate times shown herein when the shop drawings are not submitted in conformance with the approved schedule."

1.05.02-5(a). Submissions: Substitute "oversight" for "administering" when citing the Construction District and add "and Municipality" to the end of the sentence.

1.05.02-5(b). Submissions: Substitute "Designer" for "Assistant District Engineer of the administering Construction District".

1.05.02-5(c). Submissions: Substitute "Designer" for "administering Construction District".

1.05.06 – Cooperation with Utilities (including railroads):

Add the following:

Within the project there may be public utility structures; and, notwithstanding any other clause or clauses of this Contract, the Contractor cannot proceed with his work until he has made diligent inquiry with the utility companies, municipal authorities or other utility owners to determine their exact location, and notified "Call Before You Dig". The Contractor shall notify, in writing, the utility companies, municipalities or other owners involved of the nature and scope of the project and of his operations that may affect their facilities or property. Copies of such notices shall be sent to the Engineer.

SECTION 1.07 – LEGAL RELATIONS AND RESPONSIBILITIES

1.07.01—Laws to be Observed: is amended as follows:

In the second sentence of the first paragraph, after the word "State" add the words "and Municipality".

1.07.03—Proprietary Devices, Materials and Processes: is amended as follows:

After the word "State" add the words "and Municipality" throughout this Article.

1.07.04—Restoration of Surfaces Opened Pursuant to Permit or Contract: is amended as follows:

Replace the word "Department" with "Municipality" throughout this Article.

1.07.07—Safety and Public Convenience: is amended as follows:

In the penultimate paragraph, after the word "Department," add the words "or Municipality".

1.07.09—Protection and Restoration of Property: is supplemented and amended as follows:

Add the words "or Municipality" after the word "State" wherever the word "State" appears in this Article.

Add the phrase "or Municipality, as applicable" after the word "Department" wherever the word "Department" appears in this Article.

1.07.10—Contractor's Duty to Indemnify the State Against Claims for Injury or Damage: is amended as follows:

Revise the title of this Article to read "Contractor's Duty to Indemnify the State and/or Municipality Against Claims for Injury or Damage."

In the first sentence, delete the words "the Department".

Replace the word "State" with "State and/or Municipality" throughout this Article.

Replace the word "Commissioner" with "Engineer" throughout this Article.

Add the following paragraph after the only paragraph:

"It is further understood and agreed by the parties hereto, that the Contractor shall not use the defense of Sovereign Immunity in the adjustment of claims or in the defense of any suit, including any suit between the State and/or Municipality and the Contractor, unless requested to do so by the State and/or Municipality."

1.07.11—Opening of Section of Project to Traffic or Occupancy: is amended as follows:

Replace the word "State" with "Municipality" or "Municipal" throughout this Article.

Add the following sentence to the last paragraph:

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

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

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

Mr. Robert Longo
Superintendent
City of Bristol Water & Sewer Department
119 Riverside Avenue, P.O. Box 58
Bristol, CT 06010
Phone: 860-582-7431

Mr. Paul Keegan
Project Engineer
City of Bristol Water & Sewer Department
Phone: 860-582-7431

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

Mr. Samuel Akorede
Gas Engineer, Gas Project Engineering
Yankee Gas Services Company dba
Eversource Energy - Gas

1.07.14—Personal Liability of Representatives of the State: is amended as follows:

Add the words "and Municipality" after the word "State".

1.07.15—No Waiver of Legal Rights: is amended as follows:

Replace the words "Commissioner" and "Department" with "Municipality" or "Municipal" throughout this Article.

1.07.16—Unauthorized Use of Area(s) within the Project Site: is amended as follows:

Replace the words "Commissioner" and "State" with "Municipality" throughout this Article.

Add the following new Subarticle:

1.07.19—Personal Liability of Representatives of the Municipality

In carrying out any of the provisions of these specifications, or in exercising any power or authority granted to them by or within the scope of the Contract, the Engineer and his authorized representatives, including consultant engineering firms and their employees, shall be subject to no liability, either personally or as officials of the Municipality, it being understood that in all such matters they act solely as agents and representatives of the Municipality.

SECTION 1.08 – PROSECUTION AND PROGRESS

Article 1.08.04 – Limitations and Operations – Add the following:

The Contractor shall coordinate with City of Bristol prior to roadway closures or roadway 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 which will interfere with the described traffic operations on all project roadways as follows:

Monday through Friday - Midnight to 7:00 AM and 5:00 PM to Midnight

No work on Saturdays and Sundays, City Special Events, or Holidays listed below unless approved by the City.

Holiday Schedule

Martin Luther King Day

President's Day

Good Friday

Memorial Day

Independence Day

Labor Day

Columbus Day

Veteran's Day

Thanksgiving

Day after Thanksgiving

Christmas Day

New Year's Day

Bridge No. 04487

During the rehabilitation of the Bridge No. 04487, the Contractor will be permitted to close the road and detour traffic in accordance with the Detour Plan.

The Contractor shall install signs legally closing the road to traffic as shown on the detour plan for the bridge. The Contractor shall then physically close the road to traffic as shown on the plans for each bridge or as directed by the Engineer.

Access to Adjacent Properties

During the rehabilitation of the Bridge No. 04487, the Contractor must maintain access to the automotive business north of the bridge along the east side of the street. The Contractor may

restrict access to the garage bay closest to the bridge (Bay 4) during construction. However, access to Bay 1 and Bay 3 must be maintained throughout construction. Access to Bay 3 must provide minimum requirements for a City of Bristol Ambulance to turn into and exit the bay for repairs. Access to these bays may be temporarily restricted on weekends and outside the business's operating hours with at least two weeks (14 days) notice to the City, the Engineer and the business owner. The Contractor shall coordinate with the City, the Engineer and business owner to provide a mutually agreeable access configuration.

Article 1.08.07 – Determination of Contract Time:

Add the following:

For this contract, the number of Calendar Days allowed for the completion of the project shall be 241 calendar days.

SECTION 1.09 – MEASUREMENT AND PAYMENT

Section 1.09 is supplemented and amended as follows:

Throughout this Section, make the following substitutions for all occurrences of the word(s) identified below for substitution:

"Municipality" or "Municipal" for "Department" and for "State".

Substitute "Engineer" for "Commissioner".

SECTION 1.10 – ENVIRONMENTAL COMPLIANCE

1.10.02—Compliance with Laws and Regulations: is amended as follows:

Replace the word "Department" with "Municipality" throughout this Article.

In the last sentence of the last paragraph of this Article, delete the phrase "under any other State contract".

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

Replace the word "Department" with "Municipality" throughout this Article.

In the last sentence of the second paragraph, delete the phrase "under any other State contract".

Add the following sentence after the second sentence of the third paragraph:

The following items may also be superseded by specific permits from the Connecticut Department of Transportation, Connecticut Department of Energy and Environmental Protection (DEEP) and/or the appropriate local wetlands and watercourses regulatory authority.

In Paragraph No. 13, replace "State right-of-way" with "State or Municipal right-of-way."

1.10.07—Controlled and Hazardous Materials: is amended as follows:

Replace the word "Department" with "Municipality" throughout this Article.

SECTION 1.11 – CLAIMS

Section 1.11 is supplemented and amended as follows:

Throughout this Section make the following substitutions for all occurrences of the word(s) identified below for substitution:

Substitute "Chief Administrative Official of the Municipality" for "Commissioner".
Substitute "Municipality" or "Municipal" for "Department".

DIVISION II – CONSTRUCTION DETAILS

Throughout all the various Sections contained in Division II, substitute the word "Municipality" or "Municipal" for "Department" wherever "Department" appears, except in those instances where the word "Department" is used to identify a state agency.

DIVISION III – MATERIALS SECTION

Throughout all the various Sections contained in Division III, substitute the word "Municipality" or "Municipal" for "Department" wherever "Department" appears, except in those instances where the word "Department" is used to identify a state agency.

CODE OF ETHICS

The Contractor shall comply with the provisions contained in Section 1-86e of the Connecticut General Statutes, which provides as follows:

- (a) No person hired by the state as a Contractor or independent contractor shall:
 - (1) Use the authority provided to the person under the contract, or any confidential information acquired in the performance of the contract, to obtain financial gain for the person, an employee of the person or a member of the immediate family of any such person or employee;
 - (2) Accept another state contract which would impair the independent judgment of the person in the performance of the existing contract; or
 - (3) Accept anything of value to a person hired by the state as a Contractor or independent contractor based on an understanding that the actions of the Contractor or independent contractor on behalf of the state would be influenced.
- (b) No person shall give anything of value to a person hired by the state as a Contractor or independent contractor based on an understanding that the actions of the Contractor or independent contractor on behalf of the state would be influenced.

The following clause is applicable to those contracts with a value of Five Hundred Thousand Dollars (\$500,000) or more:

The Contractor shall comply with the Code of Ethics for Public Officials, Conn. Gen. Stat. §§ 1-79 *et seq.*, and Code of Ethics for Lobbyists, Conn. Gen. Stat. §§ 1-91 *et seq.*, when and where applicable. Insofar as state contractors are concerned, a summary of the most relevant provisions of the Codes of Ethics is contained in the Summary of State Ethics Laws for Current and Potential State Contractors. The Contractor acknowledges receiving such Summary, which is incorporated herein by reference. The Summary may change from time to time and may be accessed via the Internet at www.ethics.state.ct.us.

The Contractor agrees that the above clause will also be incorporated in all of its contracts with its subcontractors and consultants.

The Contractor agrees that any instance of it violating the Code of Ethics or the Department of Transportation Ethics Policy will be sufficient cause for the Department to terminate any or all of the Contractor's pending contracts with the Department.

In addition, the Contractor hereby acknowledges and agrees to comply with the policies enumerated in "Connecticut Department of Transportation Policy Statement Policy No. F&A-10, Subject: Code of Ethics Policy", dated June 1, 2007, a copy of which is attached hereto and made a part hereof.



CONNECTICUT DEPARTMENT OF TRANSPORTATION POLICY STATEMENT

POLICY NO. F&A-10
June 1, 2007

SUBJECT: Code of Ethics Policy

The purpose of this policy is to establish and maintain high standards of honesty, integrity, and quality of performance for all employees of the Department of Transportation ("DOT" or "Department"). Individuals in government service have positions of significant trust and responsibility that require them to adhere to the highest ethical standards. Standards that might be acceptable in other public or private organizations are not necessarily acceptable for the DOT.

It is expected that all DOT employees will comply with this policy as well as the Code of Ethics for Public Officials, and strive to avoid even the appearance of impropriety in their relationships with members of the public, other agencies, private vendors, consultants, and contractors. This policy is, as is permitted by law, in some cases stricter than the Code of Ethics for Public Officials. Where that is true, employees are required to comply with the more stringent DOT policy.

The Code of Ethics for Public Officials is State law and governs the conduct of all State employees and public officials regardless of the agency in which they serve. The entire Code, as well as a summary of its provisions, may be found at the Office of State Ethics' web site: www.ct.gov/ethics/site/default.asp. For formal and informal interpretations of the Code of Ethics, DOT employees should contact the Office of State Ethics or the DOT's Ethics Compliance Officer or her designee.

All State agencies are required by law to have an ethics policy statement. Additionally, all State agencies are required by law to have an Ethics Liaison or Ethics Compliance Officer. The DOT, because of the size and scope of its procurement activities, has an Ethics Compliance Officer who is responsible for the Department's: development of ethics policies; coordination of ethics training programs; and monitoring of programs for agency compliance with its ethics policies and the Code of Ethics for Public Officials. At least annually, the Ethics Compliance Officer shall provide ethics training to agency personnel involved in contractor selection, evaluation, and supervision. A DOT employee who has a question or is unsure about the provisions of this policy, or who would like assistance contacting the Office of State Ethics, should contact the Ethics Compliance Officer or her designee.

The DOT Ethics Compliance Officer is:

Denise Rodosevich, Managing Attorney
Office of Legal Services

**For questions, contact the Ethics
Compliance Officer's Designee:**

Alice M. Sexton, Principal Attorney
Office of Legal Services
2800 Berlin Turnpike
Newington, CT 06131-7546
Tel. (860) 594-3045

To contact the Office of State Ethics:

Office of State Ethics
20 Trinity Street, Suite 205
Hartford, CT 06106
Tel. (860) 566-4472
Facs. (860) 566-3806
Web: www.ethics.state.ct.us

Enforcement

The Department expects that all employees will comply with all laws and policies regarding ethical conduct. Violations of the law may subject an employee to sanctions from agencies or authorities outside the DOT. Whether or not another agency or authority imposes such sanctions, the Department retains the independent right to review and respond to any ethics violation or alleged ethics violation by its employees. Violations of this policy or ethics statutes, as construed by the DOT, may result in disciplinary action up to and including dismissal from State service.

Prohibited Activities

1. **Gifts:** DOT employees (and in some cases their family members) are prohibited by the Code of Ethics and this Policy from accepting a gift from anyone who is: (1) doing business with, or seeking to do business with, the DOT; (2) directly regulated by the DOT; (3) prequalified as a contractor pursuant to Conn. Gen. Stat. §4a-100 by the Commissioner of the Department of Administrative Services (DAS); or (4) known to be a registered lobbyist or a lobbyist's representative. These four categories of people/entities are referred to as "restricted donors." A list of registered lobbyists can be found on the web site of the Office of State Ethics (www.ct.gov/ethics/site/default.asp). A list of prequalified consultants and contractors, *i.e.*, those seeking to do business with the DOT, can be found on the DOT's Internet site under "Consultant Information" and "Doing Business with ConnDOT," respectively.

The term "gift" is defined in the Code of Ethics for Public Officials, Conn. Gen. Stat. §1-79(e), and has numerous exceptions. For example, one exception permits the acceptance of food and/or beverages valued up to \$50 per calendar year from any one donor and consumed on an occasion or occasions while the person paying or his representative is present. Therefore, such food and/or beverage is not a "gift." Another exception permits the acceptance of items having a value up to ten dollars (\$10) provided the aggregate value of all things provided by the donor to the recipient during a calendar year does not exceed fifty dollars (\$50). Therefore, such items are not a "gift." Depending on the circumstances, the "donor" may be an individual if the individual is bearing the expense, or a donor may be the individual's employer/group if the individual is passing the expense back to the employer/group he/she represents.

This policy requires DOT employees to immediately return any gift (as defined in the Code of Ethics) that any person or entity attempts to give to the employee(s). If any such gift or other item of value is received by other than personal delivery from the subject person or entity, the item shall be taken to the Office of Human Resources along with the name and address of the person or entity who gave the item. The Office of Human Resources, along with the recipient of the item of value, will arrange for the donation of the item to a local charity (e.g., Foodshare, local soup kitchens, etc.). The Office of Human Resources will then send a letter to the gift's donor advising the person of the item's donation to charity and requesting that no such gifts be given to DOT employees in the future.

2. **Contracting for Goods or Services for Personal Use With Department Contractors, Consultants, or Vendors:** Executive Order 7C provides that: "Appointed officials and state employees in the Executive Branch are prohibited from contracting for goods and services, for personal use, with any person doing business with or seeking business with his or her agency, unless the goods or services are readily available to the general public for the price which the official or state employee paid or would pay."

3. ***Gift Exchanges Between Subordinates and Supervisors/Senior Staff:*** A recent change in the Code of Ethics prohibits exchanges of gifts valued at \$100 or more between (*i.e.*, to and from) supervisors and employees under their supervision. The Citizen's Ethics Advisory Board has advised that: (1) the monetary limit imposed by this provision is a per-gift amount; (2) gifts given between supervisors and subordinates (or *vice versa*) in celebration of a "major life event," as defined in the Code of Ethics, need not comply with the \$100 limit; and (3) the limitations imposed by this provision apply to a direct supervisor and subordinate *and to any individual up or down the chain of command*. The Citizen's Ethics Advisory Board has also advised that supervisors or subordinates may not pool their money to give a collective or group gift valued at \$100 or more, even though each of the individual contributions is less than \$100.
4. ***Acceptance of Gifts to the State:*** A recent change to the Code of Ethics for Public Officials modified the definition of the term "gift" to limit the application of the so-called "gift to the State" exception. In general, "gifts to the State" are goods or services given to a State agency for use on State property or to support an event and which facilitate State action or functions. Before accepting any benefit as a "gift to the State," DOT employees should contact the Ethics Compliance Officer.
5. ***Charitable Organizations and Events:*** No DOT employee shall knowingly accept any gift, discount, or other item of monetary value for the benefit of a charitable organization from any person or entity seeking official action from, doing or seeking business with, or conducting activities regulated by, the Department.
6. ***Use of Office/Position for Financial Gain:*** DOT employees shall not use their public office, position, or influence from holding their State office/position, nor any information gained in the course of their State duties, for private financial gain (or the prevention of financial loss) for themselves, any family member, any member of their household, nor any "business with which they are associated." In general, a business with which one is associated includes any entity of which a DOT employee or his/her immediate family member is a director, owner, limited or general partner, beneficiary of a trust, holder of 5 percent or more stock, or an officer (president, treasurer, or executive or senior vice president).

DOT employees shall not use or distribute State information (except as permitted by the Freedom of Information Act), nor use State time, personnel, equipment, or materials, for other than State business purposes.

7. ***Other Employment:*** DOT employees shall not engage in, nor accept, other employment that will either impair their independence of judgment with regard to their State duties or require or induce them to disclose confidential information gained through their State duties.

Any DOT employee who engages in or accepts other employment (including as an independent contractor), or has direct ownership in an outside business or sole proprietorship, shall complete an Employment/Outside Business Disclosure Form (see attached) and submit it to the Department's Human Resources Administrator. Disclosure of other employment to the DOT Human Resources Administrator shall *not* constitute approval of the other employment for purposes of the Code of Ethics for Public Officials.

Inquiries concerning the propriety of a DOT employee's other employment shall be directed to the Office of State Ethics to assure compliance with the Code of Ethics for Public Officials. Employees anticipating accepting other employment as described above should give ample time (at least one month) to the Office of State Ethics to respond to such outside employment inquiries.

No employee of the DOT shall allow any private obligation of employment or enterprise to take precedence over his/her responsibility to the Department.

8. **Outside Business Interests:** Any DOT employee who holds, directly or indirectly, a financial interest in any business, firm, or enterprise shall complete an Employment/Outside Business Disclosure Form (see attached) and submit it to the Department's Human Resources Administrator. An indirect financial interest includes situations where a DOT employee's spouse has a financial interest in a business, firm, or enterprise. A financial interest means that the employee or his spouse is an owner, member, partner, or shareholder in a non-publicly traded entity. Disclosure of such outside business interests to the DOT Human Resources Administrator shall *not* constitute approval of the outside business interest under this Policy or the Code of Ethics for Public Officials. DOT employees shall not have a financial interest in any business, firm, or enterprise which will either impair their independence of judgment with regard to their State duties or require or induce them to disclose confidential information gained through their State duties. Inquiries concerning the propriety of a DOT employee's outside business interests shall be directed to the Office of State Ethics to assure compliance with the Code of Ethics for Public Officials.
9. **Contracts With the State:** DOT employees, their immediate family members, and/or a business with which a DOT employee is associated, may not enter into a contract with the State, other than pursuant to a court appointment, valued at \$100 or more unless the contract has been awarded through an open and public process.
10. **Sanctioning Another Person's Ethics Violation:** No DOT official or employee shall counsel, authorize, or otherwise sanction action that violates any provision of the Code of Ethics.
11. **Certain Persons Have an Obligation to Report Ethics Violations:** If the DOT Commissioner, Deputy Commissioner, or "person in charge of State agency procurement" and contracting has reasonable cause to believe that a person has violated the Code of Ethics or any law or regulation concerning ethics in State contracting, he/she *must* report such belief to the Office of State Ethics. All DOT employees are encouraged to disclose waste, fraud, abuse, and corruption about which they become aware to the appropriate authority (see also Policy Statement EX.O.-23 dated March 31, 2004), including, but not limited to, their immediate supervisor or a superior of their immediate supervisor, the DOT Office of Management Services, the Ethics Compliance Officer, the Auditors of Public Accounts, the Office of the Attorney General, or the Office of the Chief State's Attorney.
12. **Post-State Employment Restrictions:** In addition to the above-stated policies of the Department, DOT employees are advised that the Code of Ethics for Public Officials bars certain conduct by State employees *after they leave State service. Upon leaving State service:*
 - **Confidential Information:** DOT employees must never disclose or use confidential information gained in State service for the financial benefit of any person.
 - **Prohibited Representation:** DOT employees must *never* represent anyone (other than the State) concerning any "particular matter" in which they participated personally and substantially while in State service and in which the State has a substantial interest.

DOT employees also must not, for one year after leaving State service, represent anyone other than the State for compensation before the DOT concerning a matter in which the State has a substantial interest. In this context, the term "represent" has been very broadly defined. Therefore, any former DOT employee contemplating post-State employment work that might involve interaction with any bureau of DOT (or any Board or Commission administratively under the DOT) within

their first year after leaving State employment should contact the DOT Ethics Compliance Officer and/or the Office of State Ethics.

- **Employment With State Vendors:** DOT employees who participated substantially in, or supervised, the negotiation or award of a State contract valued at \$50,000 or more must not accept employment with a party to the contract (other than the State) for a period of one year after resigning from State service, if the resignation occurs within one year after the contract was signed.

13. **Ethical Considerations Concerning Bidding and State Contracts:** DOT employees also should be aware of various provisions of Part IV of the Code of Ethics that affect any person or firm who: (1) is, or is seeking to be, prequalified by DAS under Conn. Gen. Stat. §4a-100; (2) is a party to a large State construction or procurement contract, or seeking to enter into such a contract, with a State agency; or (3) is a party to a consultant services contract, or seeking to enter into such a contract, with a State agency. These persons or firms shall not:

- With the intent to obtain a competitive advantage over other bidders, solicit any information from an employee or official that the contractor knows is not and will not be available to other bidders for a large State construction or procurement contract that the contractor is seeking;
- Intentionally, willfully, or with reckless disregard for the truth, charge a State agency for work not performed or goods not provided, including submitting meritless change orders in bad faith with the sole intention of increasing the contract price, as well as falsifying invoices or bills or charging unreasonable and unsubstantiated rates for services or goods to a State agency; and
- Intentionally or willfully violate or attempt to circumvent State competitive bidding and ethics laws.

Firms or persons that violate the above provisions may be deemed a nonresponsible bidder by the DOT.

In addition, no person with whom a State agency has contracted to provide consulting services to plan specifications for any contract, and no business with which such person is associated, may serve as a consultant to any person seeking to obtain such contract, serve as a contractor for such contract, or serve as a subcontractor or consultant to the person awarded such contract.

DOT employees who believe that a contractor or consultant may be in violation of any of these provisions should bring it to the attention of their manager.

Training for DOT Employees

A copy of this policy will be posted throughout the Department, and provided to each employee either in hard copy or by e-mail. As set forth above, State law requires that certain employees involved in contractor/consultant/vendor selection, evaluation, or supervision must undergo annual ethics training coordinated or provided by the Ethics Compliance Officer. If you believe your duties meet these criteria, you should notify your Bureau Chief to facilitate compilation of a training schedule. In addition, the DOT Ethics Compliance Officer can arrange for periodic ethics training provided by the Office of State Ethics. Finally, the Department will make available, on its web site or otherwise, a copy of this policy to all vendors, contractors, and other business entities doing business with the Department.

Important Ethics Reference Materials

It is strongly recommended that every DOT employee read and review the following:

- Code of Ethics for Public Officials, Chapter 10, Part 1, Conn. General Statutes Sections 1-79 through 1-89a found at: www.ct.gov/ethics/site/default.asp
- Ethics Regulations Sections 1-81-14 through 1-81-38, found at: www.ct.gov/ethics/site/default.asp
- The Office of State Ethics web site includes summaries and the full text of formal ethics advisory opinions interpreting the Code of Ethics, as well as summaries of previous enforcement actions: www.ct.gov/ethics/site/default.asp. DOT employees are strongly encouraged to contact the Department's Ethics Compliance Officer or her designee, or the Office of State Ethics with any questions or concerns they may have.

(This Policy Statement supersedes Policy Statement No. F&A-10 dated January 6, 2006)

Ralph J. Carpenter
COMMISSIONER

Attachment

List 1 and List 3

(Managers and supervisors are requested to distribute a copy of this Policy Statement to all employees under their supervision.)

cc: Office of the Governor, Department of Administrative Services, Office of State Ethics

Department of Transportation Employment & Outside Business Disclosure Form

In accordance with Department of Transportation (Department) Policy Statement No. F&A-10, Code of Ethics Policy, I am hereby advising the Department that in addition to my current DOT position, I have other employment and/or a direct or indirect financial interest in an outside business as follows:

1. Full name of outside employer, or entity in which I or my spouse have a financial interest (e.g., ownership or member/partner):

2. Location of Employer/Entity disclosed above: _____
3. Nature of my/my spouse's relationship to employer/entity disclosed above (check at least one):
 Employee or Independent Contractor (circle one)
 Owner/Member/Partner/etc.
 Family Member of Owner/Member/Partner/etc.
4. State agency(ies) with which above employer/entity is doing business or seeking Business (write "N/A" if not applicable): _____
5. Job Title at Outside Employer: _____
6. Job Responsibilities at Outside Employer: _____

7. Current State Title: _____
8. Current State Job Responsibilities: _____

9. Name/Title of Current State Supervisor: _____

I understand that the filing of this Disclosure with the DOT Human Resources Administrator does not relieve me of any obligations I have to comply with the Code of Ethics for Public Officials, and does not constitute approval of my outside employment and/or financial interests under the Code of Ethics for Public Officials. *Employees engaging in outside employment are strongly urged to seek written approval of their outside employment from the Office of State Ethics, 20 Trinity Street, Hartford, CT 06106.* I also understand that if either my State or outside employment/financial interest changes in location or function I am required to notify the Department immediately.

Signed: _____ Date: _____
Printed Name: _____

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 thirteen percent (13%) 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.
- Packagers, 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)

SPECIAL PROVISIONS

ITEM 0020903A – LEAD COMPLIANCE FOR MISCELLANEOUS EXTERIOR TASKS

Description:

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

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

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

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

Materials:

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

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

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

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

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

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

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

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

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

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

Construction Methods:

(1) Pre-Abatement Submittals and Notices

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

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

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

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

3. Name and qualifications of Contractor's OSHA Competent Person under 29 CFR 1926.62.

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

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

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

No activity shall commence until all required submittals have been received and found acceptable to the Engineer. Those employees added to the Contractor's original list will be allowed to perform work only upon submittal of acceptable documentation to, and review by, the Engineer.

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

(2) Lead Abatement Provisions

A. General Requirements:

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

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

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

As necessary, the Contractor shall:

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

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

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

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

If at any time, procedures for engineering, work practice, administrative controls or other topics are anticipated to deviate from those documented in the submitted and accepted Lead Work Plan,

the Contractor shall submit a modification of its existing plan for review and acceptance by the Engineer prior to implementing the change.

If air samples collected outside of the Regulated Area during activities impacting lead paint indicate airborne lead concentrations greater than original background levels or 30 ug/m³, 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 (ug/m³), shower rooms must be provided. The Shower Room shall be of sufficient capacity to accommodate the number of workers. One shower stall shall be provided for each eight (8) workers. Showers shall be equipped with hot and cold or warm running water. Shower water shall be collected and filtered using best available technology and disposed of in accordance with all Federal, State and local laws, regulations and ordinances.

D. Personal Protection:

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

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

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

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

E. Air Monitoring Requirements

The Contractor shall:

1. Provide air monitoring equipment including sample filter cassettes of the type and quantity required to properly monitor operations and personnel exposure surveillance throughout the duration of the project.
2. Conduct initial exposure monitoring to determine if any employee performing construction tasks impacting lead paint may be exposed to lead at or above the OSHA Action Level of 30 micrograms per cubic meter. Monitoring shall continue as specified in the OSHA standard until a negative exposure assessment is developed.
3. Conduct personnel exposure assessment air sampling, as necessary, to assure that workers are using appropriate respiratory protection in accordance with OSHA Standard 1926.62. Documentation of air sampling results must be recorded at the work site within twenty-four (24) hours and shall be available for review until the job is complete.

F. Lead Abatement Procedures

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

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

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

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

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

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

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

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

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

Bridge No. 04487 East Street – Over Pequabuck River, Bristol, CT

- Detectable amounts of lead were identified on the painted metal surfaces of Bridge No. 04487.

Railings	Metal	Grey	6.7 % by weight
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- TCLP waste stream sampling/analysis will need to be completed if there is any incidental lead paint waste associated with the removal and recycling of East Street bridge railings.

Rail paint debris	Not completed
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While conducting work to the bridges, where it is necessary to impact the lead painted metal surfaces, the Contractor shall either:

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

The Contractor shall submit a Work Plan to ConnDOT outlining the exact procedures that will be used to perform the work, contain the spread of lead debris and protect the employees performing the required renovation work impacting the lead paint. No work shall be started by the Contractor until the Work Plan is approved by the Engineer.

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

The Engineer has characterized the paint waste stream associated with the structural steel/metal painted bridge components at Bridge Nos. 01765, 01766, 03160A, 03160B, 03160C, 03160D, 03301 & 03303 as RCRA hazardous waste. If the paint is removed from the structural steel/metal bridge surfaces, the paint shall be handled and disposed of in

accordance with USEPA/CTDEEP Hazardous Waste Regulations as described under this Item 0020903A.

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

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

Special Requirements:

1. Demolition/Renovation:
 - a. Demolish/renovate in a manner which minimizes the spread of lead contamination and generation of lead dust.
 - b. Implement dust suppression controls, such as misters, local exhaust ventilation, etc. to minimize the generation of airborne lead dust.
 - c. Segregate work areas from non-work areas through the use of barrier tape, drop cloths, etc.
 - d. Clean up immediately after renovation/demolition has been completed
2. Chemical Removal:
 - a. Apply chemical stripper in quantities and for durations specified by manufacturer.
 - b. Where necessary, scrape lead paint from surface down to required level of removal (i.e. stabilized surface, bare substrate with no trace of residual pigment, etc.). Use sanding, hand scraping, and dental picks to supplement chemical methods as necessary.
 - c. Apply neutralizer compatible with substrate and chemical agent to substrate following removal in accordance with manufacturer's instructions.
 - d. Protect adjacent surfaces from damage from chemical removal.
 - e. Maintain a portable eyewash station in the work area.
 - f. Wear respirators that will protect workers from chemical vapors.
 - g. Do not apply caustic agents to aluminum surfaces.

3. Mechanical Paint Removal:

- a. Provide sanders, grinders, rotary wire brushes, or needle gun removers equipped with a HEPA filtered vacuum dust collection system. Cowling on the dust collection system for orbital-type tools must be capable of maintaining a continuous tight seal with the surface being abated. Cowling on the dust collection system for reciprocating-type tools shall promote an effective vacuum flow of loosened dust and debris. Inflexible cowlings may be used on flat surfaces only. Flexible contoured cowlings are required for curved or irregular surfaces.
- b. Provide HEPA vacuums that are high performance designed to provide maximum static lift and maximum vacuum system flow at the actual operating vacuum condition with the shroud in use. The HEPA vacuum shall be equipped with a pivoting vacuum head.
- c. Remove lead paint from surface down to required level of removal (i.e. stabilized surface, bare substrate with no trace of residual pigment, etc.). Use chemical methods, hand scraping, and dental picks to supplement abrasive removal methods as necessary.
- d. Protect adjacent surfaces from damage from abrasive removal techniques.
- e. "Sandblasting" type removal techniques shall not be allowed.

4. Component Removal/Replacement:

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

G. Prohibited Removal Methods:

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

The use of sand, steel grit, air, 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 cowled HEPA vacuum dust collection systems is prohibited.

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

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

H. Clean-up and Visual Inspection:

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

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

The Engineer will conduct a visual inspection of the work areas in order to document that all surfaces have been maintained as free as practicable of accumulations of lead in accordance with 29 CFR 1926.62(h). If visible accumulations of waste, debris, lead paint chips or dust are found in the work area, the Contractor shall repeat the cleaning, at the Contractor's expense, until the area is in compliance. The visual inspection will detect incomplete work, damage caused by the abatement activity, and inadequate clean up of the work site.

I. Post-Work Regulated Area Deregulation:

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

A final visual inspection of the work area shall be conducted by the Competent Person and the Project Monitor or Engineer to ensure that all visible accumulations of suspect materials have been removed and that no equipment or materials associated with the lead paint removal remain.

If this final visual inspection is acceptable, the Contractor will reopen the Regulated Area and remove all signage.

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

J. Waste Disposal/Recycling:

Non-metallic building debris waste materials tested and found to be non-hazardous Construction and Demolition (C&D) bulky waste shall be disposed of properly at a CTDEEP approved Solid Waste landfill as described under this Item 0020903A.

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

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

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

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

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

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

Clean Earth of North Jersey, Inc., (CENJ) 115 Jacobus Avenue, South Kearny, NJ 07105 Phone: (973) 344-4004; Fax: (973) 344-8652	Clean Harbors Environmental Services, Inc. 2247 South Highway 71, Kimball, NE 69145 Phone: (308) 235-8212; Fax: (308) 235-4307
Clean Harbors of Braintree, Inc. 1 Hill Avenue, Braintree, MA 02184 Phone: (781) 380-7134; Fax: (781) 380-7193	Cycle Chem (General Chemical Corp.) 217 South First Street, Elizabeth, NJ 07206 Phone: (908) 355-5800; Fax (908) 355-0562
EnviroSafe Corporation Northeast (former Jones Environmental Services (NE), Inc.) 263 Howard Street, Lowell, MA 01852 Phone: (978) 453-7772; Fax: (978) 453-7775	Environmental Quality Detroit, Inc. 1923 Frederick Street, Detroit, MI 48211 Phone: (800) 495-6059; Fax: (313) 923-3375

Republic Environmental Systems 2869 Sandstone Drive, Hatfield, PA 19440 Phone: (215) 822-8995; Fax: (215) 997-1293	Northland Environmental, Inc. (PSC Environmental Systems) 275 Allens Avenue, Providence, RI 02905 Phone: (401) 781-6340; Fax: (401) 781-9710
Environmental Quality Company: Wayne Disposal Facility 49350 North I-94 Service Drive Belleville, MI 48111 Phone: (800) 592-5489; Fax: (800) 592-5329	

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

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

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

All debris shall be contained and collected daily or more frequently as directed by the Engineer, due to debris buildup. Debris shall be removed by HEPA vacuum collection. Such debris and paint chips shall be stored in leak-proof storage containers in the secured storage site, or as directed by the Engineer. The storage containers and storage locations shall be reviewed by the Engineer and shall be located in areas not subject to ponding. Storage containers shall be placed on pallets and closed and covered with tarps at all times except during placement, sampling and disposal of the debris.

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

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

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

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

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

END OF SECTION

ITEM #0202213A - REUSE OF EXISTING CHANNEL BOTTOM MATERIAL

Description: Work under this item shall include stockpiling and protecting the excavated channel bottom material, transport, and subsequent placement of the stockpiled material as shown in the plans or as directed by the Engineer. This item also includes the removal and proper disposal off-site of all unused material.

Materials: The material for this item shall consist of the existing naturally formed material within the channel as approved by the Engineer. Broken concrete will not be accepted. If an insufficient quantity of material is available from the existing channel bottom at the site, the Contractor shall furnish supplemental material meeting the approval of the Engineer from other sources within the project limits, or from another approved source. Material the Contractor proposes to bring to the site from another source must be inspected and approved by the Engineer at the source prior to the hauling of the material. Bank run gravel, if approved for use as supplemental material, shall be uncrushed, conforming to the requirements of M.02.02-1.

Construction Methods: The Contractor shall prepare an area within the project limits, if possible, suitable in size and location for storing the excavated channel bottom material so that it will not be contaminated, mixed with other excavated material or eroded. The selected area shall minimize the disruption to the channel and wetland areas caused by moving the excavated material to and from the stockpile. The temporary stockpile area(s) shall be prepared prior to the start of excavation for approval by the Engineer.

Prepare a clean surface for the stockpile adequate to prevent mixing with the underlying soil or other material. Provide adequate measures to contain the stockpiled material and protect it from erosion by rain or other forces. Store material excavated from the existing channel bottom separately from other excavated materials until it may be reused or disposed of, as directed by the Engineer. Do not add any other excavated or imported material to the stockpile of channel bottom material.

Complete construction of bridge to the satisfaction of the Engineer, before placing any existing channel bottom material. Notify the Engineer at least two weeks prior to initiating the placement of stockpiled channel bottom material.

Place the channel material to the thickness and in the locations shown on the plans, and as directed by the Engineer. Place the streambed material in a manner that replicates the original stream cross section.

Place or dispose of any surplus or unsuitable material in accordance with Section 2.02. Restore the stockpile area as directed by the Engineer.

Method of Measurement: Work under this item will be measured for payment by the actual number of cubic yards of channel material reinstalled in the channel bottom as shown on the plans or as directed by the Engineer. The vertical and horizontal pay limits will be the actual dimensions of the material reused as required for the construction of the bridge and as approved by the Engineer.

Basis of Payment: Payment for this work will be made at the contract unit price per cubic yard for “Reuse of Existing Channel Bottom Material”. The price shall include all materials, equipment, tools and labor incidental to the preparation of the stockpile area, hauling of the material to the stockpile area, storing, protecting, and final placement of the excavated channel bottom material. The price shall also include the disposal of surplus of existing channel bottom material.

If bank run gravel is required and approved for use as supplemental material at the site, furnishing and placing the bank run gravel will be paid for as extra work, in accordance with Article 1.04.05.

Excavation of the existing channel bottom material is included under the item “Structural Excavation – Earth (Excluding Cofferdam and Dewatering)”.

<u>Pay Item</u>	<u>Pay Unit</u>
Reuse of Existing Channel Bottom Material	C.Y.

ITEM NO. 0202315A - DISPOSAL OF CONTROLLED MATERIALS**Description:**

Work under this item shall consist of the loading, transportation and final off-site disposal/recycling/treatment of excavated materials that have been generated from Project activities, deemed excess, and brought to the designated stockpile area (s) as surplus and/or unsuitable for reuse within the Project. As specified in the *Notice to Contractor – Management of Surplus Soil*, these materials may contain low-levels of constituents of concern typical of roadway background conditions, including polycyclic aromatic hydrocarbons (PAHs), petroleum hydrocarbons, and/or metals (e.g., lead). The surplus unsuitable material shall be managed as non-hazardous construction materials; material exhibiting physical indications of contamination (i.e., odor, staining, presence of free product) shall be segregated from other materials to the extent practicable and managed in accordance with typical erosion and sedimentation controls (placed on/covered with plastic sheeting and surrounded by hay bales) pending final disposal. While levels of constituents of concern may vary, 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. These Controlled Materials, after proper characterization by the Engineer, shall be taken from the designated stockpile area(s), loaded, transported to, and disposed at a permitted treatment/recycle/ disposal facility listed herein.

The Contractor must use one or more of the following Department-approved treatment/recycle/ disposal facilities for the disposal of non-hazardous controlled materials:

Advanced Disposal Services Greentree* Landfill 635 Toby Road Kersey, PA 15846 (814) 265-1744; Don Henrichs	Advanced Disposal (Managed by Interstate Waste Services) 7095 Glades Pike Summerset, PA 15501 (814) 444-0112; Todd Cassleman
Allied Waste Niagara Fall Landfill, LLC 5600 Niagara Falls Blvd. Niagara, NY 14304 (716) 285-3398; David Hanson	Clean Earth of Carteret 24 Middlesex Avenue Carteret, NJ 07008 (732) 541-8909; Cheryl Coffee
Clean Earth of Philadelphia 3201 S. 61 Street Philadelphia, PA 19153 (215) 724-5520; Cheryl Coffee	Clean Earth of Southeast Pennsylvania, Inc. (AKA CESP) 7 Steel Road Morrisville, PA 19067 (215) 428-1700; Cheryl Coffee

Clinton Landfill 242 Church Street Clinton, MA 01510 (978) 365-4110; Chris McGown	Colonie Landfill 1319 Loudon Road Cohoes, NY 12047 (518) 951-0794; Eric Morales
Cumberland County Landfill (aka Community Refuse Services - Managed by Interstate Waste Services) 135 Vaughn Road Shippensburg, PA 17257 (717) 423-9953; Kevin Bush	Dudley Reclamation Project (W.L. French Excavating) 123 Oxford Avenue Dudley, MA (978) 663-2623; Jarrett Everton
ESMI of New York 304 Towpath Road Fort Edward, New York 12828 (800) 511-3764; Peter Hanson	ESMI of New Hampshire 67 International Drive Loudon, NH 03307 (603) 783-0228; Steve Bennitt
Hazelton Creek Properties, LLC* 280 South Church Street Hazelton, PA 18201 (870) 501-5050; Allen Swantek	Manchester Landfill 311 Olcott Street Manchester, CT 06040 (860) 647-3179; Ray Carr
Maplewood Farms 24 Ball Hill Road Berlin, MA 01503 (617) 699-5245; Kevin Francis Gervais	Rockwood Farms 355 Granby Road Granville, MA 01034 (617) 699-5245; Kevin Francis Gervais
Ontario County Landfill (Managed by Casella Waste) 3555 Post Farm Road Stanley, NY 14561 (603) 235-3597; Scott Sampson	Clean Earth of Connecticut (formerly Phoenix Soil LLC) 58 North Washington Street Plainville, CT 06062 (860) 803-1000; Todd Mahler
Red Technologies Soil 232 Airline Avenue Portland, CT 06980 (860) 342-1022; Christopher Windangle	Republic Services Conestoga Landfill* 420 Quarry Road Morgantown, PA 19543 (610) 286-6844; James Kuhn
Soil Safe, Inc. 378 Route 130 Logan Township, Bridgeport, NJ 08085 (410) 872-3990; Billy Booth	Ted Ondrick Company, LLC 58 Industrial Road Chicopee, MA 01020 (413) 592-2566; David S. Costanzo

Tunnel Hill Reclamation 2500 Township Road, 205 Route 2 New Lexington, OH 43764 (740) 342-1180; William Gay	Waste Management: RCI Fitchburg Landfill Fitchburg Princeton Road Westminster, MA 01473 (978) 874-0037; Frank Sepiol
Waste Management of New Hampshire P.O. Box 7065 90 Rochester Neck Road Rochester, NH 03839 (603) 330-2170; Ellen Bellio	Winchendon Landfill (formerly Mabardy Landfill) 580 River Street Winchendon, MA 01475 (978) 600-2125; Jarrett Everton

* - 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

The Engineer will sample materials stored at the designated stockpile at a frequency established by the selected treatment/recycling/disposal facilities. The Contractor shall designate to the Engineer which facility(s) it intends to use, as well as the facility acceptance criteria and sampling frequency, 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 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.**

It is solely the Contractor's responsibility to coordinate the disposal of Controlled Materials with its selected treatment/recycling/disposal facility(ies). The Contractor shall obtain and complete **all paperwork** necessary to arrange for material disposal (e.g., disposal facility waste profile sheets, Qualified Environmental Professional (QEP) certifications/letters, checklists, manifests/shipping papers/bills of lading, and/or any other supporting documentation, etc.). The Contractor shall retain the services of a QEP (i.e., CT Licensed Environmental Professional (LEP), MA Licensed Site Professional (LSP), Certified Hazardous Materials

Manager (CHMM), etc.), as necessary, to facilitate the completion of such documents as required by the Contractor's selected disposal facility. Prior to submission to the receiving facility, the Contractor shall provide all disposal documents to the Engineer for review and Generator signature(s), as applicable.

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 applicable Federal and State regulations. **No claim will be considered based on the failure of the Contractor's selected disposal facility(ies) 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 policies, the Contractor shall adhere to the following precautions during the transport of controlled materials off-site:

1. Transported controlled materials are to be covered sufficiently prior to leaving the site to prevent the loss of material during transport. Controlled materials must remain covered until the arrival at the selected treatment/recycling/disposal facility.
2. All vehicles departing the site are to be properly logged to show the vehicle identification, driver's name, time of departure, destination, approximate volume, and contents of materials carried.
3. No materials shall leave the site unless a treatment/recycling/disposal facility willing to accept all the material being transported and has agreed to accept the type and quantity of waste.

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 Controlled Materials. Decontamination shall be conducted at an area designated by the Engineer and shall be required prior to equipment and supplies leaving the Project, between stages of the work.

The Contractor shall use dry decontamination procedures. Residuals from dry decontamination activities shall be collected and managed as Controlled Materials. If the results from dry methods are unsatisfactory to the Engineer, the Contractor shall modify decontamination procedures as required.

The Contractor shall be responsible for the collection and treatment/recycling/disposal of any liquid wastes that may be generated by its decontamination activities in accordance with applicable regulations.

Method of Measurement:

The work of "Disposal of Controlled Materials" will be measured for payment as the actual net weight in tons of material delivered to the treatment/recycling/disposal facility. Such determinations shall be made by measuring each hauling vehicle on the certified permanent scales at the treatment/recycling/disposal facility. Total weight will be the summation of weight bills issued by the facility specific to this Project. Excess excavations made by the Contractor beyond the payment limits specified in Specification Sections 2.02, 2.03, 2.06, 2.86, 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.

Any materials stored in the stockpile area(s), which are reused within Project limits will not be measured for payment under this item. This material will be paid for in accordance with Article 1.04.05.

Equipment decontamination, the collection of residuals, and the collection and disposal of liquids

generated during equipment decontamination activities will not be measured separately for payment.

Any material processing required by the Contractor-selected disposal facility, including the proper disposal of all removed materials other than creosote treated wood, will not be measured for payment.

Basis of Payment:

This work will be paid for at the Contract unit price, which shall include the preparation of **all related waste profile and shipping paperwork**, the loading and transportation of Controlled Materials from the stockpile area(s) to the treatment/recycling/disposal facility; the fees paid to the facility for treatment/recycling/disposal; the preparation of all related paperwork; and all equipment, materials, tools, and labor incidental to this work.

This price shall also include equipment decontamination; the collection of residuals generated during decontamination and placement of such material in the stockpile area; and the collection and disposal of liquids generated during equipment decontamination activities.

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.

Pay Item

Pay Unit

Disposal of Controlled Materials

Ton

ITEM #0202911A – CONDITION SURVEY (SITE NO. 1)

Description: Work under this item consists of performing a condition survey and monitoring of the existing facility during construction located at 9 East Street (Site No. 1).

Work shall include, but not necessarily be limited to:

1. Conducting pre- and post-construction condition surveys.
2. Laying out, furnishing, installing, protecting, maintaining, monitoring, and preparing reports for all monitoring instrumentation: Crack Monitors, Deformation Monitoring Points, and Vibration Monitors.
3. Replacement of failed, damaged or stolen instrumentation.
4. Notifying the Engineer and taking immediate remedial action to prevent the Limiting Values from being reached. Meeting with the Engineer to review current field conditions to determine further steps to be taken, before exceeding the limiting values.
5. Making adjustments to the demolition, sheeting/shoring foundation installation means and methods in order not to exceed the Limiting Values.
6. Removal of all monitoring instruments, Crack Monitors, Deformation Monitoring Points, and Vibration Monitors as specified herein, or as directed by the Engineer at the completion of construction activities.

Materials:

Crack Monitors:

Crack monitors shall be two-piece acrylic plate type monitors with crosshairs on one piece and fine grid on the other, mounted on each side of the crack with appropriate screws or quick setting epoxy as manufactured by Avongard Products, U.S.A., Ltd., Preservation Resource Group, Inc. (PRG) or approved equal.

Deformation Monitoring Points (DMPs):

DMPs shall be bolts, targets or other such devices used for monitoring by conventional survey methods. The target shall be the head of a stainless or galvanized steel bolt drilled and grouted into the structure or other devices approved by the Engineer that will allow repeatable and reproducible elevation readings when measured with conventional survey equipment.

Vibration Monitors:

Provide seismographs or vibration monitors, capable of measuring and recording particle velocity data and frequency in three mutually perpendicular directions. The Contractor's vibration specialist shall install, maintain, and calibrate the vibration monitoring instruments in accordance with the instrument manufacturer's recommendations. Any instrument showing

indication of damage, malfunction, or erratic functioning shall be replaced within 24 hours with a calibrated, functioning instrument.

Construction Methods:

Pre and Post-Conditions Surveys and Crack Monitoring:

The Contractor shall engage the services of a qualified, independent professional, acceptable to the Engineer to conduct pre- and post-construction surveys of the main structure, and other attached structures, plant, or facilities at each site. Work under this item included furnishing all necessary labor, equipment and materials to perform the condition surveys and monitor cracks. Work also includes contacting the owners by certified letter to obtain permission for entry required for the work.

A pre-construction condition survey shall be completed and 5 copies of the survey and initial monitoring measurements submitted at least 10 days prior to the start of any demolition, foundation installation, sheeting/shoring installation, or other operations using impact or vibratory equipment within 200 feet of the structures, or at an earlier stage of construction if requested by the Engineer. Initial crack monitoring measurements shall be included in this report.

The pre-construction condition survey shall consist of a visual inspection, photograph and video documentation, and written description of the exterior basement and first floor levels of the various structures examined with an emphasis on the foundation walls and any brick facade. Readily accessible portions of the interior of the structures shall also be inspected. Descriptions shall identify any existing cracks, damage, or other defects and shall include such information to make it possible to determine the effect, if any, of the construction operations on the defect. Where significant cracks or damage exists, or for defects too complicated to describe in words, photographs shall be taken and made part of the record. In addition, the significant cracks shall, with consent of the owner, be instrumented with crack monitors to record any movement of the crack. Where crack monitors are not installed, crack width measurements shall be made with suitable measuring devices. Initial crack monitoring measurements shall be recorded in the presence of Engineer and Owner's representative. All parties shall sign the record copy of the form used to record the initial readings.

The initial record of each property examined shall be signed by the representatives present and, if practicable, by the Owners of the property, whether or not they are present at the examinations.

A post-construction condition survey will be conducted upon completion of all demolition, foundation installation, sheeting/shoring installation or other operations using impact or vibratory equipment within 200 feet of the structures, or at a later date if requested by the Engineer.

The post-construction condition survey shall repeat the process used in the pre-construction survey, paying particular attention to any areas where complaints of damage have been received or damage claims have been filed. Notice shall be given to all interested parties so that they may be present during the post-construction condition survey. A form shall be provided to all representatives attending the post-construction survey showing the initial crack reading

measurements and shall provide a location to record the final measurements. Crack monitors shall be read during the final examination and can be removed if no change is noted from the initial readings. If a change is noted, the crack gauge shall remain in place until approval is given by the Engineer to remove the crack monitor. Mounting hardware or adhesives shall be removed and the surface restored when the crack gauges are removed. Representatives present shall sign the record copy of the monitoring form used to record the final readings. Crack monitors shall not be removed until the Owner or Owner's representative signs the record copy of the form recording the final crack monitoring readings.

The final record of each property examined shall be signed by the representatives present and, if practicable, by the Owners of the property, whether or not they are present at the examinations.

The Contractor shall submit 5 copies of the post-construction condition surveys including all documentation to the Engineer within 10 days of the completion of the post- construction condition survey.

Monitoring Requirements:

A. Monitoring Instrumentation Installation:

1. Install DMPs and Vibration Monitors at the locations directed by the Engineer.
For bidding purposes, assume that:
 - three (3) Vibration Monitors will be required for simultaneous deployment; and
 - three (3) DMPs will be required on each of the three structures nearest to the work (nine [9] total).
2. Crack Monitor locations will be determined and installed as part of the pre-construction condition survey.
3. All DMPs and Crack Monitors shall be installed in the presence of the Engineer.
4. Contractor to coordinate uninterrupted access, power supply (if applicable) and wireless signal (if applicable) for Vibration Monitors.
5. All DMPs and crack monitors shall be securely fixed at the approved locations and position, so that the instruments are capable of resisting disturbance from vandalism. Establish the initial elevation of DMPs to a precision of 1/8 inch (3 mm).
6. DMP benchmarks shall be selected by the Contractor and protected from damage for the duration of the work. Replace damaged or lost benchmarks at no cost to the Owner.
7. The Engineer reserves the right to modify the DMP and Vibration Monitor layout as is deemed necessary to monitor the impact of the Contractor's proposed method of construction. The DMPs shall be arranged so that monitoring can continue until

completion without interruption. Adequate access for maintenance and reading of the DMPs shall be provided.

B. Monitoring Schedules and Submittal:

1. All DMPs and Crack Monitors / crack measurement points shall be installed and initial readings completed with the Pre-construction condition survey as noted above.

In addition to the initial readings, DMPs and Crack Monitors / crack measurement points shall be monitored:

- Prior to the start of and then at least weekly when demolishing structures, extracting piles, installing sheeting/shoring, or other activities using impact or vibratory equipment within 100 feet of the structures.
- Five days before, the day before, and then daily when demolishing structures using impact methods, foundation installation, sheeting/shoring installation, or other activities using impact equipment within 100 feet of the structures.
- Before and after each pile, including for Contractor temporary works, is extracted within 30 feet of structures.
- One week after completion of all structure demolition, extraction of piles or sheeting/shoring installation, within 200 feet of the structures, and then weekly until there is no change in readings for at least three consecutive readings.

The Engineer may increase the frequency of monitoring at no additional cost should there be any changes in the measurements or other indications of movement.

Measurements shall be submitted on a form showing both the past and current measurements. A hard copy of the form with any changes from the previous days measurements circled shall be given to the Engineer by the morning after the day the readings were taken. A typed and signed form shall be submitted on a weekly basis during periods requiring monitoring, unless the Engineer approves submittal less frequently.

2. The Contractor shall monitor construction induced vibrations continuously when demolishing substructure using impact/vibratory methods, extracting piles, sheeting/shoring installation, ground improvement or using other impact equipment within 200 feet of any given site. If monitoring results associated with construction activities at certain distances from the structures result in readings less than 25 percent of the limiting values, the Engineer solely at his discretion may reduce the continuous monitoring requirement.

3. The Contractor's vibration specialist shall maintain a log of all vibration producing activities for which ground vibrations were monitored. The vibration monitoring log shall include the recorded maximum peak particle velocity and the associated frequency and the date and time for each event recorded and the type and location of the vibration producing activity, location of monitoring instruments, and the closest distance from the vibration producing activity to the monitoring instrument. In addition to immediate verbal and email notifications of significant vibrations, the vibration specialist shall submit weekly reports of vibration monitoring to the Engineer during periods when such monitoring is required. The monitoring reports shall include the vibration monitoring record data, a location plan showing areas of construction activity and monitoring locations, and a written narrative summarizing the vibration monitoring performed and the results.

C. The Contractor shall respond to the monitored readings from instrumentation as follows:

1. Implement remedial action if readings approach the Limiting Values of ½" for DMPs, 1/8" for Crack Monitors / crack measurement points, and a peak particle velocity (i.e. ground vibrations) at vibration monitoring locations of 0.5 inch per second. The term "peak particle velocity" shall be considered to mean the resultant vector sum of particle velocities in three mutually perpendicular directions at any instant in time.
2. Take all necessary steps so that the limiting values are not exceeded. The Contractor may be directed to suspend activities in the affected area with the exception of those actions necessary to avoid exceeding the limiting value.
3. If any readings exceed 50 percent of the Limiting Values, the Contractor shall:
 - a. Halt operations that are causing the instrument response values to reach 50 percent of the Limiting Value.
 - b. Meet with the Engineer to present response actions.
 - c. Implement the reviewed plan of action, which includes modifications to the Contractor means and methods necessary to reduce the potentially damaging effects of the construction activities such that the Limiting Values are not reached.

D. Damage to Instrumentation:

1. The Contractor shall protect all DMPs, Crack Monitors, and Vibration Monitors from damage due to construction operations, weather, and vandalism.

If an instrument is damaged or unusable, the Contractor's instrumentation personnel shall replace the damaged DMP or Crack Monitor within 72 hours, at

no additional cost to the State. The Engineer will be the sole judge of work stoppage in the vicinity of the damaged or unusable instrument until it is again operational, at no additional cost to the State.

E. Removal of Instruments:

1. Upon approval of the Engineer, the Contractor shall remove all above instrumentation and restore the surfaces to the Owner's satisfaction.
2. All instruments or portions hereof removed by the Contractor shall remain the property of the Contractor.

Method of Measurement: Within sixty (60) calendar days of the award of the Contract, the Contractor shall submit to the Engineer for approval a cost breakdown of his lump sum bid prices by site for these items. The submission must include substantiation showing that the cost breakdowns submitted are reasonable based on the Contractor's lump sum bids. The cost breakdown shall be in accordance with the following payment schedule:

Pre-Construction Surveys: The cost to develop and perform pre-construction surveys meeting site requirements.

Furnishing and Installation of Monitoring Devices: The cost to procure and install all required devices at each site.

Monitoring and Maintenance of Devices: The number of months and monthly cost to perform the required monitoring and prepare documentation at each site.

Post-Construction Surveys and Removal of Monitoring Devices: The cost to perform the post-construction surveys and remove monitoring devices at each site.

Basis of Payment: This work will be paid for at the contract lump sum price for each site, which price shall include all materials, tools, equipment and labor for the required work at each site including: the services of an independent professional to perform the pre- and post-construction surveys; furnishing, installation, monitoring, and removal of crack monitor gauges/measurement points and DMPs; furnishing, installation, monitoring, and removal of instrumentation to record vibration; preparation of reports; notification of the Engineer of any readings which reach 50 percent of the Limiting Values; and adjusting the means and methods in order not to exceed the Limiting Values.

Pay Item
Condition Survey (Site No. 1)

Pay Unit
L.S.

ITEM #0219011A – SEDIMENT CONTROL SYSTEM 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:

Silt sacks will be manufactured to fit the opening of the catch basin or drop inlet. Sack will 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. Once the strap is covered with sediment, the sack should be emptied, cleaned and placed back into the basin.

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

Dandy Sack™

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.comFLeXstorm Inlet Filters

Inlet & Pipe Protection

24137 W. 111th St - Unit A

Naperville, IL 60564

Telephone: (866) 287-8655

Fax: (630) 355-3477

Stone for check dams shall meet the requirements of CTDOT Standard Specification Section M.01.01, #3 aggregate. The stone shall be sound, tough, durable, angular, not subject to disintegration on exposure to water or weather, be chemically stable, and shall be suitable in all other respects for the purpose intended.

Construction Methods: Installation, removal, and maintenance shall be per manufacturer instructions and recommendations.

Stone check dams shall be placed by hand or machine, making side slopes no steeper than 1:1 with a maximum height of 3 feet at the center of the check dam. Where catch basins in drainageways are located on slopes, locate the check dam across the drainage way no further than 20 feet above the catch basin.

Stone check dams shall be inspected at least once a week and within 24 hours of the end of a storm with a rainfall amount of 0.5 inch or greater to determine maintenance needs. The Contractor shall remove the sediment deposits when deposits reach approximately half the height of the check dam. The Contractor shall replace or repair the check dam within 24 hours of observed failure. Failure of the check dam has occurred when sediment fails to be retained because:

- Stone has moved
- Soil has eroded around or under the check dam reducing its function capacity, or
- Trapped sediments are overtopping the check dam

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

Basis of Payment: Sediment Control System at Catch Basin will be paid for at the contract unit price each complete in place and accepted, which price shall include all maintenance throughout construction, materials, equipment, tools, and labor incidental thereto.

Pay Item

Sediment Control System at Catch Basin

Pay Unit

EA

ITEM #0406303A - SAWING AND SEALING JOINTS

1. Description: Work under this section shall consist of making a straight-line saw cut transversely across HMA pavement directly over the new and existing Portland Cement concrete (PCC) transverse joints. The sawing and sealing of joints shall be completed for HMA pavements with a total depth of 3 inches or greater. The saw cut shall be immediately cleaned and sealed with a joint seal material. The sawing and sealing shall commence within one week of the completion of the final lift of pavement and be a continuous operation until all joints have been completed.

2. Materials: Joint sealer conforming to the requirements of AASHTO M324 Type II. Material that is heated or cooled beyond the manufacturer's recommended temperature range shall be discarded.

3. Equipment: All equipment necessary for the work shall meet the following requirements:

- a) Kettle: The unit shall be a combination melter and pressurized applicator of a double-boiler type with space between the inner and outer shells filled with oil or other material not having a flash point of less than 600°F. The kettle shall include a temperature control indicator and mechanical agitator. The kettle shall be capable of maintaining the material at a temperature within 15°F of the manufacturer's recommended temperature.
- b) Compressor: The compressor shall have a sufficient capacity and length of hose to enable a continuous sealing operation.
- c) Saw: The saw shall be capable of providing a straight cut of uniform depth and width.

4. Construction Methods: Prior to the paving operation, the Contractor shall establish sufficient controls to locate each transverse joint. This work shall include setting markers at each joint to reference its location and alignment, and having each of these markers tied and referenced. A written procedure for this work shall be submitted to the Engineer for review prior to commencement of such work.

The saw cut will be made by using diamond saw blades with a gang blade arrangement in order to achieve the joint detail as shown on the plans. The saw cut will be in a straight line across the pavement directly over the joint. Transverse joints shall extend to a point 2 feet beyond the underlying PCC pavement. The sawed joints shall be cleaned with compressed air to the satisfaction of the Engineer.

Immediately following the cleaning, the joint seal material shall be installed. When cooled, the top of the sealant material shall be recessed a minimum of $\frac{1}{16}$ inch but not greater than $\frac{1}{8}$ inch below the adjacent pavement surface. The roadway shall not be opened to traffic until the material has become tack free. Any depression in the sealer greater than $\frac{1}{8}$ inch shall be brought up to the specified limit by further addition of joint seal material. Care shall be taken during the sealing operation to ensure that overfilling and spilling of material is avoided.

Any reflective cracking attributable to improper joint referencing or construction shall be repaired at the expense of the Contractor, in a manner approved by the Engineer for a period of one year from the date of completion of any sawed and sealed portion of final pavement.

5. Acceptance of Work: Work identified by the Engineer as not acceptable shall be re-done at the Contractor's expense. The Contractor shall notify the Engineer upon completion of required corrective work.

6. Method of Measurement: This work shall be measured by the total number of linear feet of sawing and sealing joints in bituminous concrete as indicated in the Contract plans and documents and as measured, verified, and accepted by the Engineer.

7. Basis of Payment: The accepted quantity of sawing and sealing joints in bituminous concrete shall be paid for at the contract unit price per linear foot for "Sawing and Sealing Joints." The price shall include all materials, equipment, tools, and labor incidental thereto.

Pay Item

Sawing and Sealing Joints

Pay Unit

L.F.

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: Delete the first two paragraphs and replace 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, but not be limited to steel beams, bituminous filled corrugated steel deck, bearings, bituminous wearing surface and metal bridge rail as shown on the plans or as directed by the Engineer.

This work shall also include the design, installation, maintenance, and removal of a debris shield under the superstructure.

Work under this item shall also consist of removing, containing, and collecting existing paint from all areas of steel superstructures where the Contractor will use flame-cutting, arc gouging, or welding for the superstructure demolition, because of the possible presence of lead in the existing paint or the corrugated metal sheets under the asphalt. The removal of any lead containing materials shall be in accordance with the “Lead Compliance for Abrasive Blast Cleaning & Miscellaneous Tasks” special provision.

5.03.03 - Construction Methods: Add the following:

The Contractor’s attention is drawn to the Sandy Brook being considered as a no-drop zone. The Contractor shall provide full shielding below the superstructure to prevent debris, tools, and/or other materials from entering into or dropping to the area below the superstructure.

Shielding shall be installed or removed only upon approval of the Engineer. All materials used in the shielding shall become the property of the Contractor and they shall be removed from the site at the completion of the project.

All materials demolished shall become the Contractor’s property and he shall legally dispose of the demolished materials away from the project site at no additional cost to the Town.

Submittals: Prior to commencing work on this item, the Contractor shall submit to the Engineer for approval a demolition plan that delineates the methods the Contractor will use to ensure that concrete, structural steel and other demolition materials will be prevented from falling into the Sandy Brook. The Contractor’s proposed method of demolition shall include equipment, tools, devices, etc. Work shall not commence until the Engineer has given written approval of the method of demolition.

Removal: All work shall proceed as directed by and to the satisfaction of the Engineer in accordance with the details shown on the plans and the requirements of the Special Provisions

“Maintenance and Protection of Traffic” and “Prosecution and Progress”, contained elsewhere in these Specifications.

The removal shall not result in damage to any permanent construction (new or existing) or to adjoining property. If any damage does occur it shall be repaired by the Contractor to the satisfaction of the Engineer at no additional expense to the Town.

The Contractor shall prepare and submit to the Engineer for review working drawings, computations, and written procedures for the removal of the existing deck and beams to the Engineer for review in accordance with Article 1.05.02. Acceptance of the Contractor’s plans shall not be considered as relieving the Contractor of any responsibility.

Removal of coatings, including possible lead containing paint, and disposal of associated debris shall be in compliance with the methods and processes described in the special provision for Item #0020905A – Lead Compliance for Abrasive Blast Cleaning & Miscellaneous Tasks.

5.03.05 - Basis of Payment: Add the following:

This price shall also include the furnishing, erecting, and removing the temporary shielding.

Disposal of lead debris 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 # 0521021A – STEEL-LAMINATED ELASTOMERIC BEARINGS

Description: Work under this item shall consist of furnishing and installing steel-laminated elastomeric bearings as shown on the plans, as directed by the Engineer and in accordance with these specifications.

Materials:

1. Elastomer: The elastomeric compound, used in the construction of the bearings, shall contain only virgin polychloroprene (Neoprene) as the raw polymer. The elastomer compound shall be low temperature grade 3 (as defined by the testing requirements), have a Shore "A" Durometer hardness of 60 as shown on the plans.

The elastomeric shims shall be neoprene, with a Shore "A" Durometer hardness of 60 and a low temperature grade 3, 1/16 inch and 1/8 inch thick.

Properties of the elastomer shall meet the requirements in Article 18.2.3.1 of the AASHTO LRFD Bridge Construction Specifications

2. Steel Laminae: The internal steel laminae, used for reinforcement, shall be a mild rolled steel conforming to ASTM A570M, Grade 250 or 275, ASTM A611, Grade C or D, or an approved equal.

3. External Load Plates: The external load plates shall conform to the requirements shown on the plans.

After fabrication, the external load plates of bearings used on painted steel structures shall be shop coated with primer in accordance with the requirements of the special provision "Structural Steel (Site no.1)" contained elsewhere within these specifications.

Adhesive bonding of the elastomer portion of the bearings to the external load plates is not permitted.

4. Fabrication and Fabrication Tolerances: The fabrication and fabrication tolerances of elastomeric bearings shall conform to the requirements in Articles 18.1.4 and 18.2.4 of the AASHTO LRFD Bridge Construction Specifications.

If guide pins or other devices are used to control the side cover over the steel laminates, any exposed portions of the steel laminates shall be sealed by vulcanized patching.

5. Testing: The materials for the elastomeric bearing and the finished bearings themselves shall be subjected to testing. The testing shall conform to the requirements in Article 18.2.5 of the AASHTO LRFD Bridge Construction Specifications.

Test bearings, in addition to the bearings shown on the plans, shall be furnished for each type (size and thickness) of bearing for destructive testing. The test bearings shall be furnished without external load plates.

6. Marking: Each steel-laminated elastomeric bearing shall have marked on it, with indelible ink, the following: the manufacturer's identification code or symbol, and the month and year of manufacture, the orientation, order number, lot number, bearing identification number, and elastomer type and grade (Neoprene, Grade 3). The markings should be placed on a side of the bearing that is visible after installation.

7. Certification: The Contractor shall furnish a Certified Test Report, confirming that the elastomeric bearings satisfy the requirements of these specifications, in conformance with the requirements set forth in Article 1.06.07.

Construction Methods:

Before fabricating any materials, the Contractor shall submit shop drawings to the Engineer, for review and approval, in accordance with Subarticle 1.05.02. These drawings shall include, but not be limited to, the following information: manufacturers name, complete details of the bearings, material designations, nominal hardness of the elastomer, the quantity of bearings required, including test bearings, and the location of the bearing identification.

Bearing areas, upon which the elastomeric bearings will be set, shall be cleaned of all debris. Bearing areas, shall be carefully finished, by grinding, if necessary, to a smooth, even, level surface of the required elevation, and shall show no variations from a true plane greater than 1/16 inch over the entire area upon which the elastomeric bearings are to rest.

The elastomeric bearings shall be installed as shown on the plans. The elastomeric bearings shall be installed when the temperature of the ambient air and the bearings is between 40 deg. F to 85 deg. F and has been within this range for at least 2 hours.

Adhesive bonding of the elastomeric bearings to steel and concrete surfaces is not permitted.

Welding, with the elastomeric bearings in place, will not be permitted unless there is more than 1.5 inches of steel between the weld and the elastomer. In no case shall the elastomer be exposed to temperatures greater than 400 deg. F. Welding shall conform to the requirements of Subarticle 6.03.03-6.

Assembly with high strength bolts shall conform to the requirements of Subarticle 6.03.03-19.

The elastomeric bearings shall bear uniformly on all surfaces under full dead load.

Method of Measurement: This work will be measured by the number of elastomeric bearings installed and accepted. No allowance shall be made for test bearings.

Basis of Payment: This work will be paid for at the contract unit price per cubic inch of "Steel-Laminated Elastomeric Bearings", complete in place, which price shall include all vulcanized external load plates, primer, test bearings and adhesive, materials, testing, equipment, tools and labor incidental thereto.

Sole plates, nuts, bolts, and washers shall be paid for under the item "Structural Steel (Site No. 1)"

Pay Item	Pay Unit
Steel-Laminated Elastomeric Bearings	c.i.

ITEM #0601091A - SIMULATED STONE MASONRY

Description:

This item shall consist of furnishing and installing textured and colored formed concrete surfaces using simulated stone molds (form liners) and a color staining system designed to duplicate closely the appearance of natural stone as described herein of the type and size called for on the plans, including accessories and hardware and in accordance with monolithically formed with the concrete substructure.

Materials:

1. Quality of Work: The process of form lining, texturing and color staining of the hardened concrete shall be performed in strict accordance with the manufacturer's written recommendations and as approved by the Engineer.
2. The design and pattern of form lined concrete surfaces shall follow the layout shown on the contract plans and the manufacturer's standard drawing. Final coloration of cast stone demonstrates the colors that may be apparent from aging, such as staining from oxidation, rusting and/or organic staining from soil and/or vegetation.
3. Quality Assurance:
 - a. Manufacturer of Simulated Stone Molds and Custom Coloring Systems shall have five years experience-making custom simulated stone molds and color stains to create formed concrete surfaces to match natural stone shapes, surface textures and colors.
 - b. Contractor/Subcontractor (installer) shall have five years experience pouring vertically formed architectural concrete. The installer shall be trained in the manufacturer's special techniques in order to achieve realistic surfaces.
 - c. Color Stain System Application shall be performed by the manufacturer or manufacturer's authorized representative. The stain shall be applied by an applicator who has experience with similar projects.
 - d. A Pre-installation Meeting shall be scheduled with the manufacturer's representative, installer, designer, and City inspection personnel to assure understanding of simulated stone masonry use, color staining application, requirements for construction of mockup, and to coordinate the work.
4. Protection: The Contractor is solely responsible for construction methods, means techniques and for construction site safety precautions. The contractor shall conduct all construction operations in conformance with all applicable local, state and federal safety

laws, rules, regulations and codes. All Material Safety Data Sheets (MSDS) shall be available for inspection.

5. Manufacturer: Subject to compliance with the design, referee panel and specification requirements, the contractor shall provide simulated stone masonry and color staining system as manufactured by Custom Rock International, Inc., St. Paul, Minnesota, or Fitzgerald Formliners, Santa Anna, California, or approved equal.
6. Materials:
 - a. Simulated Stone Molds (form liners) shall be made of reusable elastomeric form liners, made of high-strength urethane and cutable form liners, made of lower grade urethane, easily attachable to forms. Form liners shall leave crisp, sharp definition of the architectural surface. Recurring textural configurations exhibited by repeating, recognizable shadow patterns shall be prevented by proper casting of form liner patterns. Form liners shall not compress more than ¼ inch when concrete is poured at a rate of 10 vertical feet per hour. Form liners shall be removable without causing deterioration of surface or underlying concrete. No substitutions will be permitted.
 - b. The form liner shall conform to the pattern approved by the City including texture and color staining system and shall be as manufactured by Custom Rock International, St. Paul, Minnesota, as distributed by Connecticut Bomanite Systems, Inc., Newtown, Connecticut, or approved equal. The simulated stone masonry patterns shall be either Pattern #12003 – New England Drystack by Custom Rock International or similar and shall be submitted to the Town for approval.
 - c. The form liner shall be designed to permit 180-degree rotation and interconnection with itself or another pattern liner of differing horizontal dimension. Maximum relief of pattern and the average relief shall be as shown on the contract plans. The simulated stone pattern shall vary in a random manner in the coursing parameters to prevent noticeable multiple duplicate pattern repetition and avoid stacked joints.
 - d. In addition to orthogonal surfaces, the form liner shall be capable of forming curved and/or battered surfaces, if shown on the plans, while maintaining the dimensioned coursing and plumb vertical joints without distortion.
7. Release Agent: The release agent shall be compatible with simulated stone masonry and with color staining system to be applied to surface, as recommended by the manufacturer.
8. Form Ties: Form ties shall be designed to separate at least one inch back from finished surface, leaving only a neat hole that can be plugged with compatible patching material.
9. Color Stain: The color stain shall be a penetrating stain mix as provided by the manufacturer, shall achieve color variations present in the natural stone being simulated for the project, as approved by the Engineer and in accordance Items 1 and 2 above. The stain shall create a

surface finish that is breathable (allowing water vapor transmission) and that resists deterioration from water, acid, alkali, fungi, sunlight or weathering. The stain mix shall be a water borne, low V.O.C. material, less than 180 grams/liter and shall meet requirements for weathering resistance of 2000 hours accelerated exposure measured by weather-o-meter in accordance with ASTM G23 with 3-bulb. Scrub test 1000 revolutions. Abrasive resistance (Tabor-CF-10) 500 cycles. Adhesion ASTM D3359 1.00 MM cross cuts on glass pass 3 or higher on a scale of 1 to 5. The contractor shall supply information pertaining to chemical resistance in accordance with ASTM D1308.

Construction Methods:

1. Show Drawings and Submittals: Before fabricating any materials, the Contractor shall submit shop drawings, product data sheets, samples and mock-ups to the Engineer for approval in accordance with Article 1.05.02 for the materials listed in Item 3 below. These drawings and submittals shall include, but not limited to, the following information: manufacturers name, listing of product compliance with referenced specification standards, complete details of the assemblies, material designations, nominal hardness of appropriate materials, design loads, quantities and locations. The Engineer's drawings shall not be reproduced, traced or used for shop drawings or erection purposes.
2. Field Measurements: Prior to ordering or fabricating any materials, the Contractor shall take complete and accurate field measurements.
3. Submittals:
 - a. Catalog cuts, manufacturer's literature and technical data for the materials specified herein, including but not limited to simulated stone mold pattern, form liner, release agent, concrete patching materials and color charts for staining of hardened concrete.
 - b. Photographs: Color photographs of three (3) similar past projects of the manufacturer. Include project names, locations and a telephone number of the previous projects Owner's representatives.
 - c. Samples: Form ties, sample and description, showing method of separation when forms are removed.
 - d. Plan, elevation and details to show overall pattern, joint locations, form tie locations and end, edge and other special conditions.
 - e. Form Lined and Color Stained Concrete Mock-up: The mock-up shall be built on site at least four weeks before cast-in-place concrete work to be textured and colored starts, using same materials, methods and work force that will be used for the Project. Location on site for construction of mock-up shall be as approved by Engineer. Concrete shall be placed in the mock-up, texture constructed and construction

procedure adjusted until a final texture and color is produced that complies with is satisfactory to the Town of Glastonbury.

- i. Size: 25 s.f. or larger if needed to adequately illustrate the pattern and texture selected.
 - ii. Include an area to demonstrate simulated stone masonry butt joint, corner and if appropriate, continuation of pattern through expansion joint.
 - iii. If design includes stone texture across top of wall, include in mock-up.
 - iv. After concrete has cured sufficiently, the Contractor shall prepare the surface for color staining. After the Engineer has approved the prepared surface of the cast simulated stone masonry for color staining, the work of form lined cast-in-place concrete may proceed, except that color staining is not yet authorized.
 - v. After concrete work on mock-up is completed and cured and after surface is determined by the Engineer to be acceptable for forming and pouring, the Contractor shall proceed with mock-up as quality standard.
 - vi. After a 30 day cure of the mock-up and the date of last pour of architectural concrete the sample is to be stained. After coloring is determined to be acceptable by the Engineer, construction of the remaining work under this specification section may proceed, using mock-up as quality standard.
 - vii. The Contractor shall remove mock-up as directed by the Engineer.
4. Scheduling: Schedule color stain application after adjacent earthwork is completed, to avoid contaminating or damaging the surface. Place topsoil and establish turf after staining application is completed. Coordinate the work to prevent interference with other trades.
5. Installation:
- a. Contractor's responsibilities:
 - i. Install liners.
 - ii. Apply manufacturer release agent.
 - iii. Install concrete as specified elsewhere in the Specifications.
 - iv. Remove form liner.
 - v. Patching, grinding and bush hammering of form liner seams as required.
 - vi. Provide scaffolding and heat as required and clean water for power washing of the hardened concrete prior to the staining process.
 - vii. Power washing and patching of form liners.
 - viii. Return of form liners to manufacturer.

- b. Manufacturer's responsibilities:
- i. Ship and supply form liners and release agent.
 - ii. Technical information.
 - iii. Power wash wall.
 - iv. Apply the color staining process.
6. Liner to Form Attachment System: Securely attach form liners to forms with wood or sheet metal screws, threaded inserts added to the back of the form liner for bolts to fasten the form liner through the forms, or bolted through the face of the form liner with flat head bolts inserted in a pattern joint and through the form liner and forming system. Construction adhesives may be used, but not on reusable forms. Place adjacent form liners with less than ¼ inch separation between form liners.
7. Release of Form Liners From Hardened Concrete: Only manufacturer recommended form release agents shall be utilized and shall be applied to the form liners before the concrete is poured. Release agents shall be applied in strict accordance with release agent manufacturer recommendations. Hand-charged sprayers will only be allowed if a thin uniform coating of release agent is obtained on the form liner.
8. Remove the form liner from the wall within 24 hours of pouring the concrete. The form liners may be detached from the forms and then removed from the concrete or they may remain attached to the forms and the entire forming system removed from the concrete. Remove the form liners from the top down. Curing of concrete may be accomplished with form liners and forms placed back against the wall after the initial detachment. Other means of curing can also be used including curing blankets and/or plastic. Curing compounds shall not be used.
9. Care and Cleaning of Form Liner: Form liners shall be cleared the same day they are removed from the wall with a power wash and mild detergent. Synthetic brushes with stiff bristles may be used on areas. Mild acid washes may also be used. Solvents shall not be used. If necessary, patching of holes shall be performed with 100% clear silicone caulk. Form liners shall be stored inside or under a protective, non-transparent cover, in a vertical, upside-down position.
10. Wall Patching and Preparation: After form liners are removed from the hardened concrete, the textured uncolored surface shall be prepared for color staining. All concrete, the textured uncolored surface shall be prepared for color staining. All holes larger than ¾" in greatest principal dimension shall be filled with concrete patching material mixed with latex or acrylic bonder, as approved by the manufacturer and Engineer. All honeycombed areas shall be filled and textured to match surrounding areas. Seam lines and other unnatural protrusions shall be ground down to match adjacent areas with a hand-held power grinder

using discs made for concrete. Grinding of seams shall be performed immediately after removal of the form liners. Perform final bush hammering to blend defects and ground areas into the final rock texture. In particular, the process of wall patching and preparation shall be subject to approval of the manufacturer and Engineer.

11. Color Staining (by Manufacturer): The hardened concrete shall be a minimum of 30 days old before color staining is applied. Power wash the wall to free it from laitance, dirt, oil and other objectionable materials. After the wall has dried, the color staining process shall be applied in such a way that the stones shall have individual colorations from one to the other. Water-based stains shall be used in air temperatures between 50 degrees F and 100 degrees F. Solvent-based stains shall be used in air temperatures of 50 degrees F and below but in no case when the temperature of the hardened concrete is 40 degrees and falling. During color staining operations the Contractor shall protect property, pedestrians, vehicular and other traffic upon, underneath or in the vicinity of the bridge from disfigurement from errant stain materials. Comply with all environmental regulations regarding surface cleaning, stain application, ground and watercourse protection and disposal protection of waste materials. Refer to Section 1.10 of the Specifications.

12. Simulated Stone Molds Preparation: Clean and make free of buildup prior to each pour. Inspect for blemishes and tears. Repair if needed following manufacturer's recommendations.

Method of Measurement:

This work shall be measured for payment by the actual number of square yard of the face area of accepted simulated stone masonry, poured in place, completed within the neat lines shown on the plans, or as ordered by the Engineer.

Basis of Payment:

This Work will be paid for at the contract unit price per square yard for "Simulated Stone Masonry", complete in place, which price shall include all equipment, formwork molds, mock-up, tools and labor incidental thereto.

This work shall also include the cost of furnishing and application of the color stain system to the simulated stone masonry surface.

Pay Item
Simulated Stone Masonry

Pay Unit
S.Y.

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, two layers of the membrane coating (minimum total thickness of 80 mil and maximum total thickness not to exceed 120 mil), an additional 40 mil membrane layer with aggregate broadcast into the material while still wet, reinforcing material at deck panel joints and two applications of asphalt emulsion (tack coat) at a rate of 0.05-0.07 gal/s.y. each, allowing the first application to break prior to applying the second.

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.

Reinforcing material shall be as recommended by the manufacturer.

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

Construction Methods: At least 30 days prior to installation of the membrane system, the Contractor shall submit to the Engineer a Site-specific Installation Plan that includes 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, placing of aggregated coat and all Quality Control (QC Plan) testing operations to be performed during the membrane system's installation. 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 or shown in the plans, strictly in accordance with the Installation Plan.

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 technical representative shall perform all required QC testing and remain on the Project site until the membrane has fully cured.

All QC testing, including verbal direction or observations at the time of installation, shall be recorded and submitted to the Engineer for inclusion in the Project records. The QC testing data

shall be received by the Department's project personnel prior to any paving over the finished membrane, or within 24 hours following completion of any staged portion of the work.

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 submittal of the Installation Plan. The Engineer shall have sole authority to determine the adequacy and compliance of the submitted information. Inadequate proof of ability to perform the work will be grounds to reject proposed applicators.

2. **Job Conditions:**

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

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

(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 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 product 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. Any peak greater than ¼ inch above the surface profile of the prepared substrate shall be ground to the surrounding elevation. Any valley or minor surface deterioration of ½ inch or greater shall also be repaired. The extent and location of 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 as indicated in the Installation Plan.

All steel components to receive membrane waterproofing shall be blast cleaned in accordance with SSPC SP6 and shall be 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 Contractor at the 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 shift for each contiguous section worked on during that shift. Additional tests may be required if atmospheric conditions change and retesting of the substrate moisture content is warranted.

The membrane system shall not be installed on substrate with a moisture content greater than 6%, or at a moisture content above the amount recommended by the system's Manufacturer, whichever is less.

- (b) Random tests for adequate tensile bond strength shall be conducted by the Contractor on the substrate using an adhesion tester in accordance with the requirements of ASTM D4541. The minimum frequency shall be one test per 5,000 s.f. but not less than three adhesion tests per shift for each contiguous section worked on during that shift. The locations of the pull tests shall be at least a distance from each other equal to or greater than 1/3 of the width or length (whichever is greater) of the area being worked in that section. The location of the pull tests shall be located in accordance with ASTM D3665 or a statistically-based procedure of stratified random sampling approved by the Engineer.

Adequate surface preparation will be indicated by tensile bond strengths of 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 new primer applied at the Contractor's expense, as directed by Engineer.

- (c) Grouted joints, materials that the membrane cannot bond to, and cracks or discontinuities that cannot be bridged over by the membrane material shall be covered by a reinforcing material recommended by the membrane system's Manufacturer prior to application of membrane layers as approved or directed by the Engineer.

6. Application:

- (a) The System shall be applied in the following distinct steps as follows:
 - 1) Substrate preparation
 - 2) Priming
 - 3) Reinforcing material application over grouted joints, cracks, etc.
 - 4) Membrane application (minimum 2 layers)
 - 5) Membrane with aggregate
- (b) Immediately prior to the application of any components of the System, the surface shall be adequately dry (see Section 5(a) of this specification) and any remaining dust or loose particles shall be removed using clean, dry, oil-free compressed air or industrial vacuum.
- (c) Where the area to be treated is bound by a vertical surface (e.g. curb or wall), the membrane system shall be continued up the vertical, if shown on the plans or directed by the Engineer.
- (d) The handling, mixing and addition of components shall be performed in a safe manner to achieve the desired results, in accordance with the Manufacturer's recommendations or as approved or directed by the Engineer.

- (e) A neat finish with well defined boundaries and straight edges shall be provided by the Applicator.
- (f) Primer: The primer shall consist of one coat with an overall coverage rate of 125 to 175 s.f./gal unless otherwise recommended in the Manufacturer's written instructions.

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

The primer shall be spray applied using a single component spray system approved for use by the Manufacturer. If required by Site conditions and allowed by the manufacturer brush, squeegee or roller application will be allowed.

The primer shall be allowed to cure tack-free for a minimum of 30 minutes or as required by the Manufacturer's instructions, whichever time is greater, prior to application of the first lift of waterproofing membrane.

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

- (g) Membrane and Reinforcing Material: Application of the membrane on the primed surface shall not commence until the primer is cured as described in Section 6(f) of this specification and the adhesion pull tests are completed in accordance with Section 5(b) of this specification.

The waterproofing membrane shall consist of two coats for a total dry film thickness of a minimum 80 mils but not to exceed 120 mils. Adjacent coats shall be of a contrasting color to aid in Quality Assurance and inspection. Any reinforcing material shall be applied immediately before the first coat of membrane in accordance with the Manufacturer's recommendations.

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 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.

Repair the membrane system following destructive testing and correct any deficiencies in the membrane system or substrate noted during QC testing in accordance with the Manufacturer's recommendations to the satisfaction of the Engineer at no additional cost to the State.

- (h) **Repairs:** 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 layers. A continuous layer shall be obtained over the substrate with a four-inch 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 coated area to a point where no membrane material is visible. The membrane and aggregate shall be fully integrated after the aggregate has been applied and the membrane cured.
 - 2) Localized areas not fully coated shall be touched-up with additional membrane and aggregate as needed.
 - 3) Using motorized mechanical sweepers or a vacuum sweeper apparatus, remove all 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. Any areas not fully coated after sweeping shall be touched up with additional membrane and aggregate as needed.

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 criteria that do not meet the requirements of the Engineer shall be addressed at this time.

Method of Measurement: This item shall be measured by the number of square yards of waterproofed surface completed and accepted.

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

<u>Pay Item</u>	<u>Pay Unit</u>
Membrane Waterproofing (Cold Liquid Elastomeric)	s.y.

ITEM #0728032A – NO. 6 CRUSHED STONE

Description:

This item shall consist of the furnishing and placing crushed stone beneath the bottom of footings of abutments, wingwalls, and barrier walls as shown on the plans, or as directed by the Engineer.

Materials:

The material for this work shall conform to the requirements of Table M.01.02-2 for No. 6 Coarse aggregate.

Construction Methods:

The crushed stone shall be placed by suitable methods which will not crush the stone and shaped to a smooth, uniform grade as shown on the plans or as directed by the Engineer.

Method of Measurement:

This work will be measured for payment by the actual number of cubic yards of No. 6 Crushed Stone installed, accepted and measured in place.

Basis of Payment:

This work will be paid for at the contract unit price per cubic yard for “No. 6 Crushed Stone”, complete in place, which price shall include all materials, tools, equipment and work incidental thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
No. 6 Crushed Stone	C.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 #0904990A - METAL BRIDGE RAIL

Description: Work under this item shall consist of fabricating and installing a steel open bridge railing, consisting of steel wide flange shapes for posts, steel pickets and steel rectangular tube shapes for rails connected to preset anchorages, as shown on the plans, as directed by the Engineer and in accordance with this specification.

Materials: Materials for this work shall conform to the following requirements:

The steel rails Hollow Railing Structural Tubing (HSS) shall be fabricated from structural steel tubing meeting the requirements of ASTM A500, Grade B and meet the longitudinal CVN requirements of 15 ft-lbs @ 0° F or ASTM A501. The minimum horizontal bending radii of the HSS Tubing shall be 8 feet.

Wide flange posts and base plates shall be fabricated from steel meeting the requirements of AASHTO M270, Grade 50. Picket carrier angles, anchor plates, and splice tube plates shall conform to ASTM A513, Grade 36 or ASTM A500, Grade B.

All posts, railings, rail splices, anchorage plates, and other shapes shall be galvanized after shop fabrication in conformance with AASHTO M111.

Threaded anchor rods shall conform to the requirements of ASTM A193, Class 1 or Class 2, Grade B8 (AISI Type 304). The manufacturer's symbol and the grade shall be clearly marked on the bolt heads. Heavy hex nuts shall conform to the requirements of ASTM A194, Grade 8. Washers shall be standard size and conform to ASTM A167, Types 302 through 305.

Dome head bolts used for connecting the top railings, deflected thread type locknuts and flat washers for splices shall conform to the requirements of ASTM A307.

Bolts used for connecting the lower railings to the wide flange posts shall conform to ASTM A325.

All bolts, other than threaded rods, locknuts, nuts, cap screws and washers shall be galvanized in conformance with ASTM A153.

Grout used beneath the railing base plates shall be non-shrink and shall meet the requirements of Article M.03.05.

The Contractor shall furnish a Materials Certificate in conformance with the requirements of Article 1.06.07 for the following materials: rail posts, rails, post connections devices, rail splices, bolts, washers and grout.

Construction Methods: Before fabricating any materials, 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 layout plan showing post

spacing, post to baseplate connection, rail to post connections, anchorage details, expansion joint locations, material designations and the name and telephone number of a person to contact who can answer questions about the shop drawings

Welding and fabrication of steel shall conform to the AASHTO Standard Specifications for Highway Bridges and the ANSI/AASHTO/AWS D1.5 Bridge Welding Code. If the members are tubular sections, the fabrication and welding shall conform to the ANSI/AWS D1.1 Structural Welding Code-Steel.

See the contract drawings for rail post layout and spacing. Posts shall not be located closer than 1'-3" to an expansion joint or end of a deck and shall be spaced no more than 10'-0" apart.

The anchorage assemblies and rail posts shall be installed perpendicular to the grade of the gutterline. The anchorages shall be firmly and accurately held in position prior to and during the placing of concrete.

The rails and the holes in the posts shall be constructed parallel to the gutterline. Holes may be field drilled in rails. All field-drilled holes shall be coated with an approved zinc rich paint before erection.

The rails shall be carefully adjusted prior to fixing in place to insure proper matching at abutting joints and correct alignment and curvature throughout their length.

Lengths of rails shall be sufficient to be attached to at least 2 rail posts.

For structures having railings with a radius of 400' or more, the railing may be sprung into place. For structures having railings with a radius of less than 400', the railing shall be curved. Curving may be done by cold bending or by hot bending.

Rail splice expansion joint shall be provided between any two posts which span an expansion joint. Bolts located at the expansion joints shall be provided with lock nuts and shall be tightened only to a point that will allow rail movement.

After installation, all rails and posts shall be free of burrs, sharp edges and irregularities.

The voids beneath the base plates shall be dry packed.

Painting:

Galvanized hardware need not be shop painted; however any part of the bolts, screws, nuts and washers that are accessible after installation shall be painted in the field in accordance with Subsection Touch-Up and Repair below.

Prior to painting, the galvanizer shall ensure that all rails and rail components are smooth and have a suitable surface for accepting the paint. All runs shall be removed by grinding.

The galvanized surface shall be prepared for painting by one of the following methods.

Method 1: The two coat paint system shall be applied within twelve hours of galvanizing. The surface shall be blast cleaned immediately before painting (maximum of eight hours) in accordance with requirements of SSPC SP7 "Brush-Off Blast Cleaning" or other method producing equivalent results and uniform profile, to achieve a 1.0 to 1.5 mil anchor profile as indicated by Keane Tator Surface Profile Comparator or similar device. All detrimental material, i.e., dirt, grease, other foreign matter, shall be removed prior to blasting.

Method 2: The two coat paint system shall be applied within 15 days of galvanizing. In preparation for the two coat painting system, the surface shall be blast cleaned in accordance with the requirements of SSPC SP7 "Brush-Off Blast Cleaning", or other method producing equivalent results and uniform profile, to achieve a 1.0 to 1.5 mil anchor profile as indicated by a Keane Tator Profile Comparator or similar device. All detrimental material such as oil, grease, dirt, other foreign matter, shall be removed prior to blast cleaning. The blast cleaning shall be performed prior to the formation of "white rust" on the galvanized surface. If "white rust" is detected, the steel shall be stripped and re-galvanized in accordance with these specifications.

The preparation shall be followed by a pretreatment of zinc or iron phosphate. The phosphate shall be applied to the blast cleaned material within eight hours of blast cleaning. Phosphating shall be applied in accordance with the manufacturer's recommendations. The material shall be painted within twelve hours of phosphating. The applicator shall submit the procedure for phosphating to the Engineer for approval prior to performing the work.

The phosphating applicator shall maintain a record of in-process quality checks on the solutions.

The prime coat material shall be a polyamide epoxy applied to a minimum dry film thickness of 3.0 mils and force cured as given below for the finish coat.

The finish coat material shall be a two component, catalyzed aliphatic urethane applied by airless spray to a minimum dry film thickness of 3.0 mils.

The color and the corresponding Color Number as found in Federal Standard 595B, "Colors Used in Government Procurement", shall be stated on the Plans. The fabricator shall submit to the Engineer for approval, paint chips of the intended color prior to any work being done under this heading.

All finish coat material shall be applied under conditions within the following tolerances:

Air Temperature:	50 to 90°F
Surface Temperature:	50 to 100°F
Humidity:	65% max.

The finish coat shall be cured in a booth maintained at 150° F for two to four hours.

Should the coating system fail within one year after the project has been accepted, the damaged coating shall be repaired by the Contractor at no cost to the Department. The method of repair shall be acceptable to the Department.

Touch-Up and Repairs:

Should any damage occur to the coating during shipping or handling at the job site, the contractor shall repair and touch- up any damaged areas to the satisfaction of the Engineer and the following:

Touch-up of the galvanizing before the finish coat is applied shall be accomplished by applying a galvanizing repair paint in accordance with Section M.06.03. The dry film thickness of the applied repair paint shall not be less than 3.0 mils. Applications shall be in accordance with the Manufacturer's instructions.

Field touch-up procedures shall conform to the recommendations of the company that performed the initial painting. Touch-up of the finish coat shall be by applying a coating of a two part urethane, as supplied by the company that performed the initial painting, to achieve a dry film thickness of at least 3.0 mils. Prior to the application of the paint, remove all damaged coatings down to a solidly adhered coating and apply galvanizing repair paint as a primer. Allow the primer to dry for at least four hours.

The Contractor shall also use the touch-up paint material to paint the galvanized hardware used in the field erection of the railing that has not been finish coated previously.

All paint used for touch-up and repair shall be the same manufacturer's brand and lot number as was used in the shop.

Method of Measurement: This work will be measured for payment by the actual number of feet of open bridge rail completed and accepted, measured along the rail from one rail end anchorage to the other rail end anchorage.

Basis of Payment: This work will be paid for at the contract unit price per linear foot for "Metal Bridge Rail", complete and accepted in place, which price shall include all materials, equipment, tools, labor and work incidental thereto.

Pay Item

Metal Bridge Rail

Pay Unit

L.F.

ITEM #0969060A - CONSTRUCTION FIELD OFFICE, SMALL

Description:

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

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

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

Description \ Office Size	Small	Med.	Large	Extra Large
Minimum Sq. Ft. of floor space with a minimum ceiling height of 7 ft.	400	720	1400	2800
Minimum number of exterior entrances.	2	2	2	2
Minimum number of parking spaces.	7	7	10	15

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

Unless otherwise approved by the Engineer, office space shall be partitioned into segregated work areas for each user as follows:

- Each work area (or cubicle) shall be a minimum of 8 feet x 8 feet, with full height walls or tall cubicle partitions (minimum 6 feet high), placed to provide a minimum of 6 feet walking space around and between each user work area (for social distancing).
- Only one user (workstation/desk) per work area.
- Desks, tables, and other work surfaces shall be arranged so that adjacent users do not face each other.

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

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

water and flush-type toilets. For all facilities the Contractor shall supply lavatory and sanitary supplies as required.

Windows and Entrances: The windows shall be of a type that will open and close conveniently, shall be sufficient in number and size to provide adequate light and ventilation, and shall be fitted with locking devices, blinds, and screens. The entrances shall be secure, screened, and fitted with a lock for which four keys shall be furnished. All keys to the construction field office shall be furnished to the CTDOT and will be kept in their possession while State personnel are using the office. Any access to the entrance ways shall meet applicable building codes, with appropriate handrails. Stairways shall be ADA/ABA compliant and have non-skid tread surfaces. An ADA/ABA compliant ramp with non-skid surface shall be provided with the Extra-Large field office.

Lighting: The Contractor shall equip the office interior with electric lighting that provides a minimum illumination level of 100 foot-candles at desk level height, and electric outlets for each desk and drafting table. The Contractor shall also provide exterior lighting that provides a minimum illumination level of 2 foot-candles throughout the parking area and for a minimum distance of 10 ft. on each side of the field office.

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

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

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

- A. 120/240 volt, 1 phase, 3 wire
- B. Ampacity necessary to serve all equipment. Service shall be a minimum 100 amp dedicated to the construction field office.
- C. The electrical panel shall include a main circuit breaker and branch circuit breakers of the size and quantity required.
- D. Additional 120-volt, single phase, 20-amp, isolated ground dedicated power circuit with dual NEMA 5-20 receptacles will be installed at each desk and personal computer table (workstation) location.
- E. Additional 120-volt, single phase, 20-amp, isolated ground dedicated power circuit with dual NEMA 5-20 receptacles will be installed, for use by the Telephone Company.

- F. Additional 120-volt circuits and duplex outlets as required meeting National Electric Code requirements.
- G. One exterior (outside) wall mounted GFI receptacle, duplex, isolated ground, 120-volt, straight blade.
- H. After work is complete and prior to energizing, the State's CTDOT electrical inspector, must be contacted at 860-594-2240. (Do Not Call Local Town Officials)
- I. Prior to field office removal, the CTDOT Office of Information Systems (CTDOT OIS) must be notified to deactivate the communications equipment.

Heating, Ventilation and Air Conditioning (HVAC): The field office shall be equipped with sufficient and properly operating, heating, air conditioning, and ventilation equipment to maintain a temperature range of 68°-80° Fahrenheit within the field office. The Contractor shall increase ventilation rates and increase the percentage of outdoor air that circulates into the system where possible.

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

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, 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 6 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 for CTDOT employee staffed field offices as soon as the facility is in place and requested by the Contractor. The central wiring location will be determined with designated CTDOT District staff as soon as the facility is in place and requested by the Contractor.

The Contractor shall provide LAN switches and patch panels as needed to provide the data speeds and connections specified. The contractor shall run a CAT 6 LAN cable from each workstation and networked device (including Multi-Function Laser Printer/Copier/Scanner, printers, and docking stations) to the contractor supplied patch panel/LAN switch area leaving an additional 10 feet of cable length on each side with terminated RJ45 connectors. The Contractor shall install patch panel and LAN switch in data circuit area. Each run / jack shall be clearly labeled with an identifying Jack Number.

The Contractor shall supply cables to connect all devices to the Contractor supplied internet router, switches, and RJ45 connections 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, contractor supplied devices, and smartboards listed below.

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

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

Furnishing Description	Office Size			
	Small	Med.	Large	Extra Large
	Quantity			
Office desk (2.5 ft. x 5 ft.) with drawers, locks, and matching desk chair that have pneumatic seat height adjustment and dual wheel casters on the base.	1	3	5	8
Standard secretarial type desk and matching desk chair that has pneumatic seat height adjustment and dual wheel casters on the base.	-	-	-	1
Personal computer tables (4 ft. x 2.5 ft.).	2	3	5	8
Drafting type tables (3 ft. x 6 ft.) and supported by wall brackets and legs; and matching drafter's stool that have pneumatic seat height adjustment, seat back and dual wheel casters on the base.	1	1	1	2
Conference table, 3 ft. x 12 ft.	-	-	-	1
Table – 3 ft. x 6 ft.	-	-	-	1
Office Chairs.	2	4	8	20
Mail slot bin – legal size.	-	-	1	1
Non-fire-resistant cabinet.	-	-	2	4
Fire resistant cabinet (legal size/4 drawer), locking.	1	1	2	3
Storage racks to hold 3 ft. x 5 ft. display charts.	-	-	1	2
Vertical plan racks for 2 sets of 2 ft. x 3 ft. plans for each rack.	1	1	2	2
Double door supply cabinet with 4 shelves and a lock – 6 ft. x 4 ft.	-	-	1	2
Case of cardboard banker boxes (Min 10 boxes/case)	1	1	2	3

Open bookcase – 3 shelves – 3 ft. long.	-	-	2	2
White Dry-Erase Board, 36" x 48" min. with markers and eraser.	1	1	1	1
Interior partitions – 6 ft. x 6 ft., soundproof type, portable and freestanding.	-	-	6	6
Coat rack with 20 coat capacity.	-	-	-	1
Wastebaskets - 30 gal., including plastic waste bags.	1	1	1	2
Wastebaskets - 5 gal., including plastic waste bags.	1	3	6	10
Electric wall clock.	-	-	-	2
Electronic Level	1	1	1	2
Furnishing Description	Office Size			
	Small	Med.	Large	Extra Large
	Quantity			
Telephone.	1	2	3	-
Full size stapler 20 (sheet capacity, with staples)	1	2	5	8
Desktop tape dispensers (with Tape)	1	2	5	8
8 Outlet Power Strip with Surge Protection	3	4	6	9
Rain Gauge	1	1	1	1
Business telephone system for three lines with ten handsets, intercom capability, and one speaker phone for conference table.	-	-	-	1
Mini refrigerator - 3.2 c.f. min.	1	1	1	1
Hot and cold-water dispensing unit. Disposable cups and bottled water shall be supplied by the Contractor for the duration of the project.	1	1	1	1
Microwave, 1.2 c.f., 1000W min.	1	1	1	1
Fire extinguishers - provide and install type and *number to meet applicable State and local codes for size of office indicated, including a fire extinguisher suitable for use on a computer terminal fire.	*	*	*	*
Electric pencil sharpeners.	1	2	2	2
Multi-Function Laser Printer/Copier/Scanner combination unit, network capable, as specified below under <u>Field Office Technology</u>	1	1	1	1
Field Office Wi-Fi Connection as specified below under <u>Field Office Technology</u>	1	1	1	1
Wi-Fi Printer as specified below under <u>Field Office Technology</u>	1	1	1	1
Digital Camera as specified below under <u>Field Office Technology</u>	1	1	3	3
Teleconferencing Equipment as specified below under <u>Field Office Technology</u>	-	-	-	-

Infrared Thermometer, including annual third-party certified calibration, case, and cleaning wipes.	1	1	1	2
Concrete Curing Box as specified below under Concrete Testing Equipment.	1	1	1	1
Concrete Air Meter and accessories as specified below under Concrete Testing Equipment as specified below. Contractor shall provide third party calibration on a quarterly basis.	1	1	1	1
Concrete Slump Cone and accessories as specified below under Concrete Testing Equipment.	1	1	1	1
First Aid Kit	1	1	1	1
T-handle concrete cylinder mold splitter as specified below under Concrete Testing Equipment	1	1	1	1
Smart Phones as specified under <u>Computer Related Hardware and Software</u> .	-	-	-	-

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

Field Office Technology:

The Contractor shall supply the Field Office Wi-Fi Connection, Wi-Fi Printer, Digital Camera(s), Smart Phones, Multifunction Laser Printer/Copier/Scanner, Conference Room Teleconferencing Equipment, as well as associated hardware and software, meeting the requirements of this specification as well as the latest minimum specifications posted, as of the project advertising date, at CTDOTs web site <https://portal.ct.gov/dot/office-of-construction/construction-field-office-technology>

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), Field Office Wi-Fi, Digital Camera(s), Smart Phones, Multifunction Laser Printer/Copier/Scanner, Teleconferencing Equipment, as well as associated hardware, the Contractor must submit a copy of their proposed order(s) with catalog cuts and specifications to the Administering CTDOT District for review and approval. The Wi-Fi Printer, Wi-Fi Router, digital cameras, smart phones, and Teleconferencing Equipment will be reviewed by CTDOT District personnel. The Multifunction Laser Printer/Copier/Scanner will be reviewed by the CTDOT OIS. The Contractor shall not purchase the hardware, software, or services until the Administering CTDOT District informs them that the proposed equipment, software, and services are approved. The Contractor will be solely responsible for the costs of any hardware, software, or services purchased without approval.

The Contractor and/or their internet service provider shall be responsible for the installation and setup of the field office Wi-Fi/internet service, 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), Smart Phones, Multifunction Laser Printer/Copier/Scanner, Teleconferencing Equipment, 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/internet service, 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 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 rainwater from the top of the post into the rain gauge. The location of the rain gauge and post shall be approved by the Engineer. The rain gauge shall be made of a durable material and have graduations of 0.1 inches or less with a minimum total column height of 5 inches. If the rain gauge is damaged the Contractor shall replace it prior to the next forecasted storm event at no additional cost.

Electronic Level: The Contractor shall supply and maintain in working order, for the duration of the Contract, the number of electronic levels, identified in the Additional Equipment, Facilities and Services table of this specification. The electronic levels shall meet the following requirements:

- A. 48-inch length, box beam type
- B. IP65 water and dust proof
- C. 0.1-degree accuracy
- D. Backlit display
- E. Carrying case included
- F. New or like new condition

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

- A. Concrete Cylinder Curing Box – meeting the requirements of Section 6.12 of the Standard Specifications.
- B. Air Meter – The air meter provided shall be in good working order and meet the requirements of AASHTO T 152.
- C. Slump Cone Mold – Slump cone, base plate, and tamping rod shall be provided in like-new condition and meet the requirements of AASHTO T119, Standard Test Method for Slump of Hydraulic-Cement Concrete.
- D. T-handle concrete cylinder mold splitter.

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

Insurance Policy: The Contractor shall provide a separate insurance policy, with no deductible, in the minimum amount of five thousand dollars (\$5,000) to insure all State-owned data equipment and supplies used in the office against all losses. The Contractor shall be named insured on that policy, and the CTDOT shall be an additional named insured on the policy. 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 professional cleaning including vacuuming carpet, washing & waxing floors, cleaning restrooms, removal of trash, general cleaning, etc.

Exterior areas shall be mowed and clean of debris. A trash receptacle (dumpster) with weekly pickup (trash removal) shall be provided. Snow removal, sanding and salting of all parking, walkway, and entrance ways areas shall be accomplished during a storm if on a workday during work hours, immediately after a storm and prior to the start of a workday. If snow removal, salting and sanding are not completed by the specified time, the State will provide the service and all costs incurred will be deducted from the next payment estimate.

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

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

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

Pay Item	Pay Unit
Construction Field Office, (Type)	Month

ITEM # 0971001A - MAINTENANCE AND PROTECTION OF TRAFFIC

Article 9.71.01 – Description is supplemented by the following:

The Contractor shall maintain and protect traffic as described by the following and as limited in the Special Provision "PROSECUTION AND PROGRESS" where applicable.

Bridge 04487, East Street over the Pequabuck River

The road will be closed to through traffic between the intersections as shown on the detour plan.

The road will be closed to all traffic at the construction site as shown in the plan.

The road will be open to local traffic between the intersections as shown in the detour plan.

The Contractor shall install detour signs and devices as indicated in the Detour Plan.

Before and after bridge rehabilitation, the Contractor will be allowed to maintain alternating one-way traffic on the road in the vicinity of the bridge on a travel path 11 feet in width during the allowable periods identified in the special provision Prosecution and Progress. The Contractor must maintain one lane of traffic in each direction at all times outside the allowable hours when the detour is not in operation.

During construction, the Contractor must maintain access to commercial driveways adjacent to the project area at all times. Any temporary closure of these travel paths must be coordinated with the City of Bristol, the Property Owner and the Engineer.

Existing Signage

The Contractor shall maintain all existing signs throughout the project limits and detour for the duration of the project and shall temporarily relocate any signs and posts as many times as deemed necessary and as directed by the Engineer. The Contractor shall re-install the signs and posts in their original locations or as directed by the Engineer. This work shall be paid for under the item "Maintenance and Protection of Traffic".

Requirements for Winter

The Contractor shall schedule a meeting with representatives of the Engineer, and the Town/City to determine what interim traffic control measures the Contractor must accomplish to provide safety to the motorist and permit adequate snow removal procedures during the winter. 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, pavement markings and signing.

Commercial and Residential Driveways

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

Article 9.71.03 - Construction Method is supplemented as follows:

Signing Patterns

The Contractor shall erect and maintain all signing patterns in accordance with the traffic control plans contained herein. Proper distances between advance warning signs and proper taper lengths are mandatory.

Pavement Markings - Non-Limited Access Roadways

During construction, the Contractor shall maintain all pavement markings on paved surfaces on all roadways throughout the limits of the Project.

Temporary pavement markings shall be installed on each intermediate course of bituminous concrete pavement and on any milled surface by the end of the work shift.

Permanent Epoxy Resin Pavement Markings shall be installed on the final course of bituminous concrete pavement within 10 calendar days of the final pavement installation if no Pavement Marking Grooves are proposed.

Temporary Pavement Markings

Temporary pavement markings that will be in place for less than 72 continuous hours may consist of temporary plastic pavement marking tape at the Contractor's expense. Additionally;

1. These temporary pavement markings shall include centerlines, lane lines (solid and broken), and stop bars.
2. Centerlines shall consist of two 4 inch wide yellow markings, 2 feet in length, side by side, 4 inches apart, at 40 foot intervals.
3. Lane lines shall consist of 4 inch wide white markings, 2 feet in length, at 40 foot intervals.
4. No passing zones shall be posted with signs in those areas where the final centerlines have not been established on two-way roadways.
5. Stop bars may consist of two 6 inch wide white markings or three 4 inch wide white markings placed side by side.
6. The temporary plastic pavement marking tape shall be installed in accordance with Section 12.12.
7. The Contractor shall remove and dispose of the temporary plastic pavement marking tape prior to another course of bituminous concrete pavement being installed.

Temporary pavement markings that will be in place for 72 continuous hours or more should consist of temporary painted pavement markings and shall be installed in accordance with Section 12.09. The markings shall include centerlines, edge lines, lane lines (solid and broken), lane-use arrows, and stop bars on each intermediate course of bituminous concrete pavement and

on any milled surface by the end of the work shift. Edge lines and lane-use arrows are not required if the next course of bituminous concrete pavement will be placed within 10 calendar days.

Temporary pavement markings, as described above, shall be maintained until the permanent pavement markings are installed.

Final Pavement Markings

Permanent epoxy resin pavement markings shall be installed in accordance with Section 12.10 and the applicable Traffic Engineering Standard Drawings.

If Temporary Plastic Pavement Marking Tape is installed, then the Contractor shall remove and dispose of these markings during the same work shift that the permanent epoxy resin pavement markings are to be installed. The cost of furnishing, installing and removing the Temporary Plastic Pavement Marking Tape shall be at the Contractor's expense.

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 a safer and more 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 or is within the clear zone. 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 in order to command respect from the motorist.

Lane reduction tapers should be placed so that the entire length of the taper is installed on a tangent section of roadway and the entire taper area can be seen by the motorist.

All existing conflicting signs shall be removed, covered with an opaque material, or turned so that they are not legible to oncoming traffic prior to implementing a traffic control pattern. The existing signs shall be uncovered or reinstalled once the pattern is removed.

A buffer area should be provided during installation of a traffic control pattern and maintained for the duration of the work. The buffer area shall be free of any equipment, workers, materials, and parked vehicles.

Traffic control patterns are not required for vehicles on an emergency patrol type activity or for a short duration stop of up to one hour, as long as the equipment is contained within the shoulder. Flashing lights, arrow boards, truck-mounted or trailer-mounted impact attenuators, and appropriate Trafficperson(s) shall be used when required.

In a situation not adequately covered by the Construction Traffic Control Plans, the Contractor shall contact the Engineer for assistance prior to setting up a traffic control pattern.

Placement of Signs

Signs shall be placed in a position that allows motorists the opportunity to reduce their speed prior to the work area. Signs shall be installed on the same side of the roadway as the work area. On multi-lane divided highways, advance warning signs shall be installed on both sides of the highway. On directional roadways (on-ramps, off-ramps, one-way roads) where the sight distance to signs is restricted, these signs should be installed on both sides of the roadway.

Allowable Adjustment of Signs and Devices Shown on the Construction Traffic Control Plans

The Construction Traffic Control Plans contained herein show the location and spacing of signs and devices under ideal conditions. Signs and devices should be installed as shown on these plans.

The proper application of the Construction Traffic Control Plans and installation of traffic control devices is dependent upon actual field conditions.

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.

Adjustments to the Construction Traffic Control Plans shall only be made at the direction of the Engineer.

Table 1 indicates the minimum taper lengths required for a lane closure based on the posted speed limit and lane width of the roadway. These taper lengths shall only be used when the recommended taper lengths shown on the Construction Traffic Control Plans cannot be achieved.

Table 1 – Minimum Taper Length

POSTED SPEED LIMIT (MPH)	MINIMUM TAPER LENGTH FOR A SINGLE LANE CLOSURE (FEET)	
	FREEWAYS	SECONDARY ROADS
30 OR LESS	180	165
35	245	225
40	320	295
45	540	495
50	600	550
55	660	605
65	780	715

1. Work Zone Safety Meetings

- 1.a) Prior to the commencement of work, a Work Zone Safety Meeting shall be conducted with representatives from the City of Bristol, the Chief of Police, the Contractor (Project Superintendent) and the Traffic Control Subcontractor (if different than the prime Contractor) to review the traffic operations, lines of responsibility, and operating guidelines which will be used on the Project. Other Work Zone Safety Meetings during the course of the Project should be scheduled as needed.
- 1.b) A Work Zone Safety Meeting Agenda shall be developed and used at the Meeting to outline the anticipated traffic control issues during the construction of this Project. Any issues that can't be resolved at these Meetings will be brought to the attention of the District Engineer and the Office of Construction. The agenda shall include:
- i. Review Project scope of work and time;
 - ii. Review Section 1.08, Prosecution and Progress;
 - iii. Review Section 9.70, Trafficpersons;
 - iv. Review Section 9.71, Maintenance and Protection of Traffic;
 - v. Review Contractor's schedule and method of operations;
 - vi. VACANT
 - vii. Open discussion of work zone questions and issues;
 - viii. Discussion of review and approval process for changes in Contract requirements as they relate to work zone areas.

2. General

- 2.a) Traffic control patterns shall only be installed if the required minimum number of signs, traffic cones, traffic drums, and other equipment (i.e. one Arrow Board for each lane closed, two Truck-Mounted or Trailer-Mounted Attenuators (TMAs), Changeable Message Sign, etc.) are on Site.**
- 2.b) The Contractor shall have spare maintenance and protection of traffic equipment (construction signs, traffic cones, traffic drums, etc.) available at all times in case of mechanical failures, etc. Spare maintenance and protection of traffic equipment installed as a result of a sudden equipment breakdown shall be replaced by the Contractor 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 lost time.
- 2.d) In cases of differences of opinion between the Contractor and the Inspection staff, the Contractor shall follow the directions of the Engineer. The matter shall be brought to the City of Bristol for resolution immediately or, in the case of work after regular business hours, on the next business day.

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 end of the work area, or traffic control pattern, and proceeding back toward the advance warning signs.
- 3.c) Stopping traffic may be allowed within the allowable hours stated in Section 1.08.04:
 - i. For those activities stated within the Contract.
 - ii. During paving, milling operations, or similar activities 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 so traffic does not travel across the longitudinal joint or difference in roadway elevation.
 - iii. To move slow moving equipment across live traffic lanes into the work area.
- 3.d) The Contractor shall adhere to using the proper signs, placing the signs correctly, and ensuring the proper spacing of signs.
- 3.e) VACANT
- 3.f) VACANT

4. VACANT

5. VACANT

6. VACANT

7. Use of Traffic Drums and Traffic Cones

- 7.a) VACANT
- 7.b) On all roadways:
 - i. 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.
 - ii. Traffic cones shall not be left unattended.
 - iii. Traffic cones with a minimum height of 42 inches shall be used when the posted speed limit is 45 MPH or above.
- 7.c) Typical spacing of traffic drums and/or cones shown on the Construction Traffic Control Plans in the Contract are maximum spacings and may be reduced to meet actual field conditions as required.

8. Use of Barricade Warning Lights

- 8.a) Barricade Warning Lights may be installed on channelizing devices when used in a merge taper. The Barricade Warning Lights shall flash in a sequential pattern when used in a merge taper. The successive flashing shall occur from the upstream end (beginning) of the merge taper to the downstream end (end) of the merge taper.
- 8.b) Type C Barricade Warning Lights may be used at night to delineate the edge of the travel way.
- 8.c) Type B Barricade Warning Lights shall be used on post-mounted advanced warning signs.

9. VACANT

10. VACANT

NOTES FOR TRAFFIC CONTROL PLANS

1. IF A TRAFFIC STOPPAGE OCCURS IN ADVANCE OF SIGN (A), THEN AN ADDITIONAL SIGN (A) SHALL BE INSTALLED IN ADVANCE OF THE STOPPAGE.
2. SIGNS (AA), (A), AND (D) SHOULD BE OMITTED WHEN THESE SIGNS HAVE ALREADY BEEN INSTALLED TO DESIGNATE A LARGER WORK ZONE THAN THE WORK ZONE THAT IS ENCOMPASSED ON THIS PLAN.
3. SEE TABLE 1 FOR ADJUSTMENT OF TAPERS IF NECESSARY.
4. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN TRAFFIC DRUMS SHALL BE USED IN PLACE OF TRAFFIC CONES.
5. ANY LEGAL SPEED LIMIT SIGNS WITHIN THE LIMITS OF A ROADWAY / LANE CLOSURE AREA SHALL BE COVERED WITH AN OPAQUE MATERIAL WHILE THE CLOSURE IS IN EFFECT, AND UNCOVERED WHEN THE ROADWAY / LANE CLOSURE IS RE-OPENED TO ALL LANES OF TRAFFIC.
6. IF THIS PLAN REMAINS IN CONTINUOUS OPERATION FOR MORE THAN 36 HOURS, THEN ANY EXISTING CONFLICTING PAVEMENT MARKINGS SHALL BE ERADICATED OR COVERED, AND TEMPORARY PAVEMENT MARKINGS THAT DELINEATE THE PROPER TRAVELPATHS SHALL BE INSTALLED.
7. DISTANCES BETWEEN SIGNS IN THE ADVANCE WARNING AREA MAY BE REDUCED TO 100' ON LOW-SPEED URBAN ROADS (SPEED LIMIT < 40 MPH).
8. IF THIS PLAN IS TO REMAIN IN OPERATION DURING THE HOURS OF DARKNESS, INSTALL BARRICADE WARNING LIGHTS - HIGH INTENSITY ON ALL POST-MOUNTED DIAMOND SIGNS IN THE ADVANCE WARNING AREA.
9. A CHANGEABLE MESSAGE SIGN SHALL BE INSTALLED ONE HALF TO ONE MILE IN ADVANCE OF THE LANE CLOSURE TAPER.
10. SIGN (P) SHALL BE MOUNTED A MINIMUM OF 7 FEET FROM THE PAVEMENT SURFACE TO THE BOTTOM OF THE SIGN.

TABLE 1 - MINIMUM TAPER LENGTHS

POSTED SPEED LIMIT (MILES PER HOUR)	MINIMUM TAPER LENGTH FOR A SINGLE LANE CLOSURE
30 OR LESS	180' (55m)
35	250' (75m)
40	320' (100m)
45	540' (165m)
50	600' (180m)
55	660' (200m)
65	780' (240m)

METRIC CONVERSION CHART (1" = 25mm)

ENGLISH	METRIC	ENGLISH	METRIC	ENGLISH	METRIC
12"	300mm	42"	1050mm	72"	1800mm
18"	450mm	48"	1200mm	78"	1950mm
24"	600mm	54"	1350mm	84"	2100mm
30"	750mm	60"	1500mm	90"	2250mm
36"	900mm	66"	1650mm	96"	2400mm



SCALE: NONE

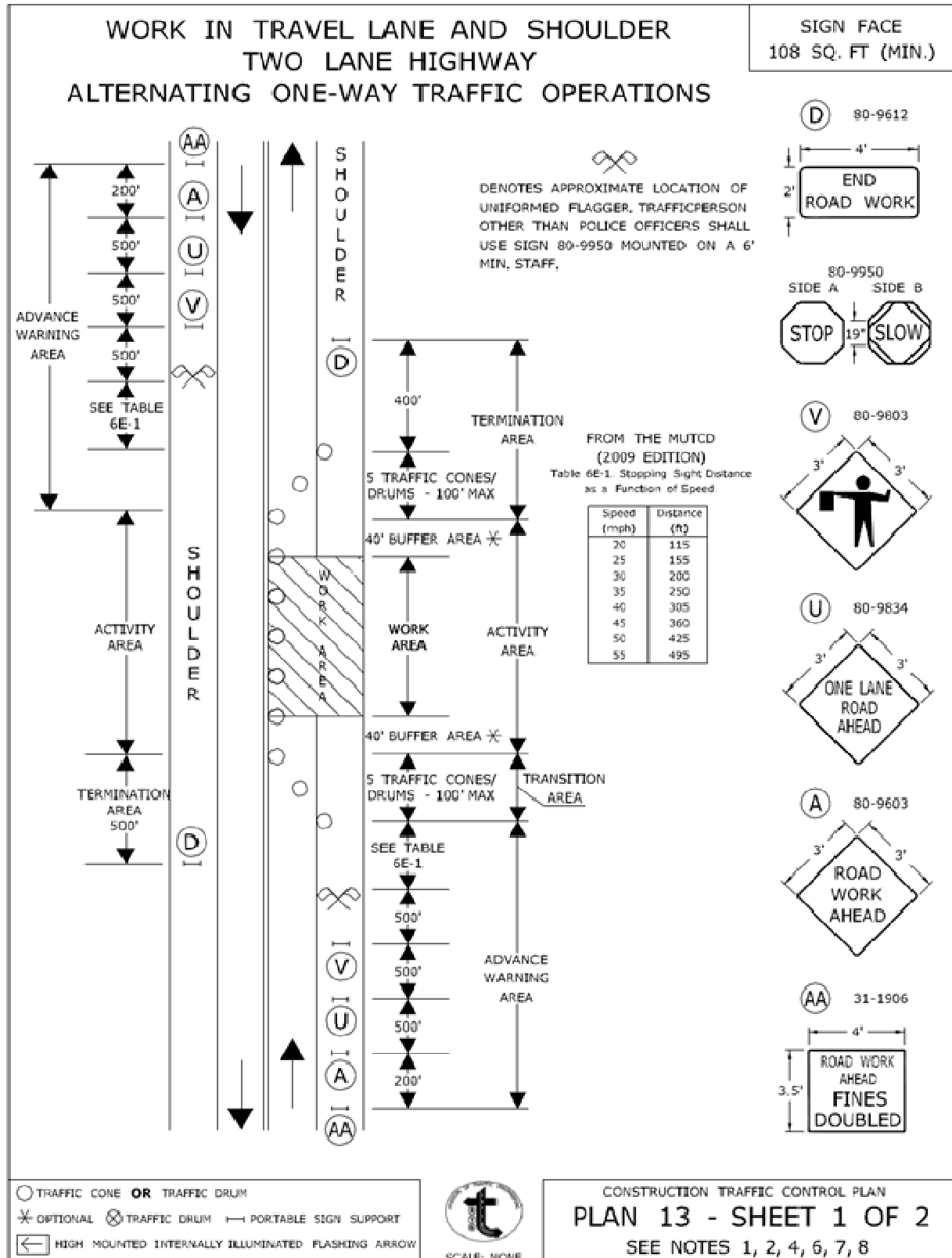
CONSTRUCTION TRAFFIC CONTROL PLAN NOTES

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED:

Charles S. Harlow
PRINCIPAL ENGINEER

Charles S. Harlow
2012.06.05 15:53:35-0400



CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED: *Charles S. Harlow*
PRINCIPAL ENGINEER
Charles S. Harlow
2012.06.05 15:55:23-04'00"

WORK IN TRAVEL LANE AND SHOULDER TWO LANE HIGHWAY ALTERNATING ONE-WAY TRAFFIC OPERATIONS

SIGN FACE
108 SQ. FT (MIN.)

HAND SIGNAL METHODS TO BE USED BY UNIFORMED FLAGGERS

THE FOLLOWING METHODS FROM SECTION 6E.07, FLAGGER PROCEDURES, IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES," SHALL BE USED BY UNIFORMED FLAGGERS WHEN DIRECTING TRAFFIC THROUGH A WORK AREA. THE STOP/SLOW SIGN PADDLE (SIGN NO. 80-9950) SHOWN ON THE TRAFFIC STANDARD SHEET TR-1220 01 ENTITLED, "SIGNS FOR CONSTRUCTION AND PERMIT OPERATIONS" SHALL BE USED.

A. TO STOP TRAFFIC

TO STOP ROAD USERS, THE FLAGGER SHALL FACE ROAD USERS AND AIM THE STOP PADDLE FACE TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE FREE ARM SHALL BE HELD WITH THE PALM OF THE HAND ABOVE SHOULDER LEVEL TOWARD APPROACHING TRAFFIC.



B. TO DIRECT TRAFFIC TO PROCEED

TO DIRECT STOPPED ROAD USERS TO PROCEED, THE FLAGGER SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. THE FLAGGER SHALL MOTION WITH THE FREE HAND FOR ROAD USERS TO PROCEED.



C. TO ALERT OR SLOW TRAFFIC

TO ALERT OR SLOW TRAFFIC, THE FLAGGER SHALL FACE ROAD USERS WITH THE SLOW PADDLE FACE AIMED TOWARD ROAD USERS IN A STATIONARY POSITION WITH THE ARM EXTENDED HORIZONTALLY AWAY FROM THE BODY. TO FURTHER ALERT OR SLOW TRAFFIC, THE FLAGGER HOLDING THE SLOW PADDLE FACE TOWARD ROAD USERS MAY MOTION UP AND DOWN WITH THE FREE HAND, PALM DOWN.



- TRAFFIC CONE **OR** TRAFFIC DRUM
- ✱ OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ◀ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



SCALE: NONE

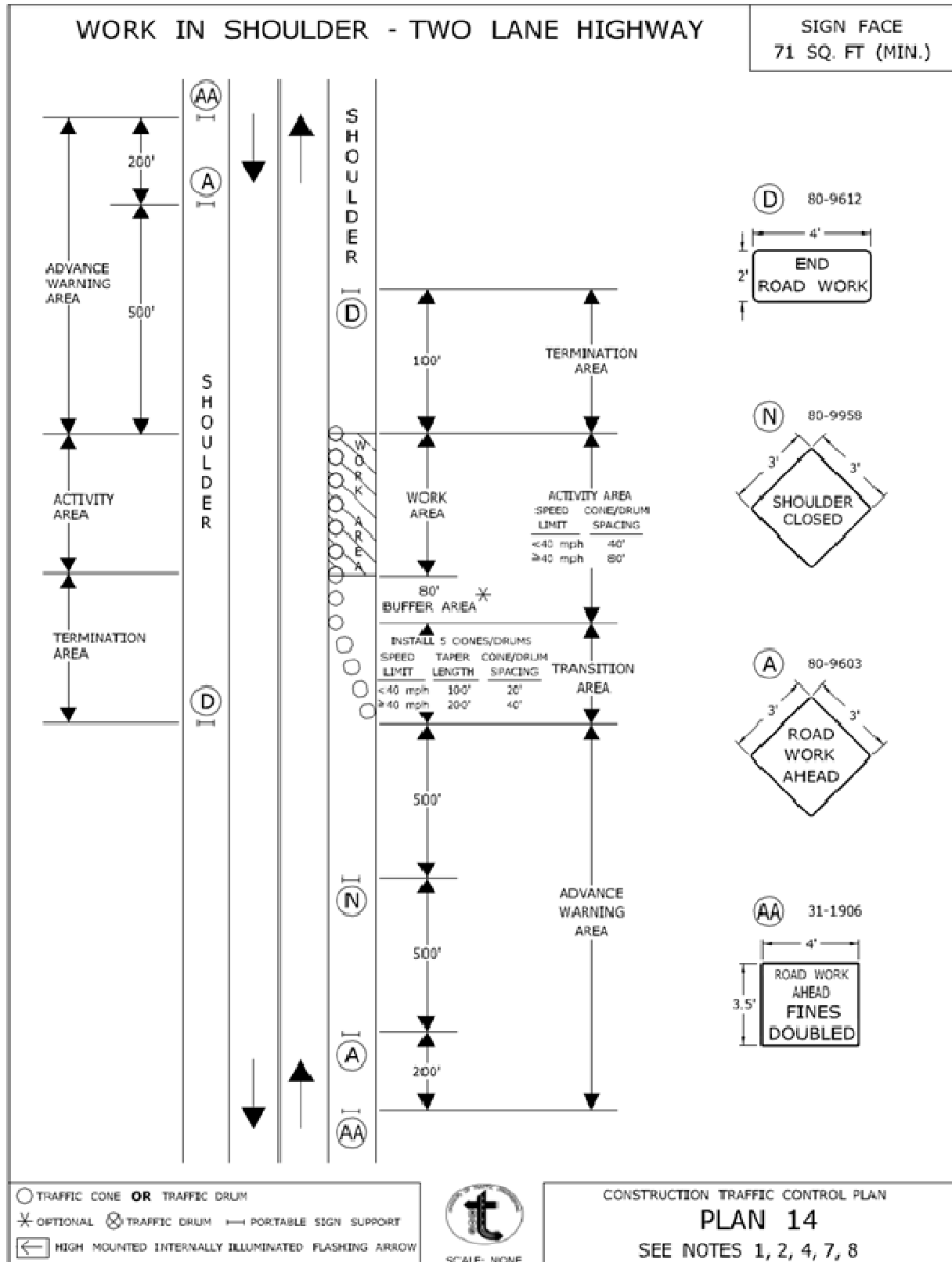
CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 13 - SHEET 2 OF 2
SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

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PRINCIPAL ENGINEER

Charles S. Harlow
2012.06.05 15:55:45-04'00"



- TRAFFIC CONE OR TRAFFIC DRUM
- ✱ OPTIONAL ⊗ TRAFFIC DRUM — PORTABLE SIGN SUPPORT
- ← HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN

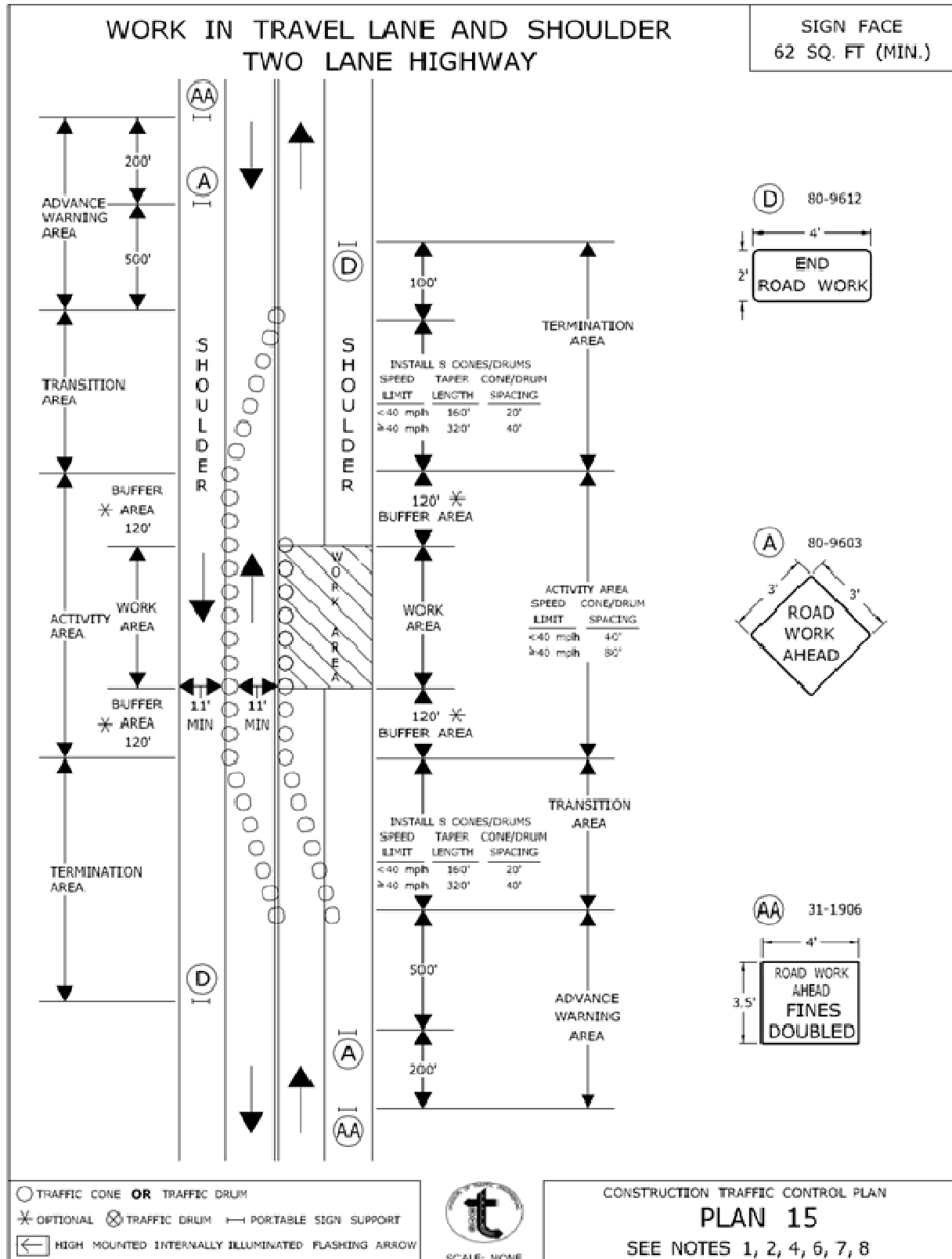
PLAN 14

SEE NOTES 1, 2, 4, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

Charles S. Harlow
 2012.06.05 15:56:09-0400
 PRINCIPAL ENGINEER



Article 9.71.05 – Basis of Payment is supplemented by the following:

The contract lump sum price for “Maintenance and Protection of Traffic” shall also include temporarily relocating existing signs and sign supports as many times as deemed necessary and furnishing, installing, and removing temporary sign supports and foundations if necessary, during construction of the project.

ITEM #0974001A – REMOVAL OF EXISTING MASONRY

Work under this item shall conform to the requirements of Section 9.74 amended as follows:

Article 9.74.03 – Construction Methods: Add the following:

The elevation of the field stone varies and shall be removed to the elevation required to install the proposed concrete cap or as directed by the engineer. The concrete shall be saw cut to delineate the removal limits. Pneumatic hammers or any other method approved by the Engineer may be used to remove the concrete. Maximum 30 pound hammers shall be used for general removal. Removal of concrete by blasting will not be permitted.

Removal shall not result in damage to any permanent existing construction. If damage does occur, it shall be repaired by the Contractor to the satisfaction of the Engineer at no additional expense to the Town.

When removing the concrete, the Contractor shall take necessary precautions to prevent debris from dropping to areas below the structure into the river.

<u>Pay Item</u>	<u>Pay Unit</u>
Removal of Existing Masonry	C.Y.

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, sheet aluminum, and/or wood 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, sheet aluminum, and/or wood 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, sheet aluminum, and/or wood 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 #1220027A – CONSTRUCTION SIGNS

Section 12.20 *is supplemented and amended as follows:*

Article 12.20.01 – Description:

Add the following:

The Contractor shall also furnish, install, maintain, and remove Bipartisan Infrastructure Law project signs. The Bipartisan Infrastructure Law project signs shall be of the details, colors and materials as shown on the attached detail sheet.

The sign legend for this Project shall include the U.S. Department of Transportation pictograph on the lower right side of the sign with the legend Federal Highway Administration.

Article 12.20.03 — Construction Methods:

Add the following:

The Contractor shall install the Bipartisan Infrastructure Law (BIL) project signs prior to initiating construction.

The Contractor shall install BIL project sign TP1550 on each major roadway approach to the construction Site in advance of the Project limit(s).

The sign detail is included and is also available at [TP1550--BIL-ROADWAY.pdf](#).

The Contractor shall maintain the BIL project signs for the entire duration of the Project. The Contractor shall relocate the BIL project signs during construction as needed and shall remove the signs after construction work is completed.

Article 12.20.05 – Basis of Payment:

Add the following:

The price shall also include furnishing, installing, maintaining, relocating, and removing the Bipartisan Infrastructure Law project signs and sign posts and all hardware, materials, and labor incidental thereto.

SIGN DETAIL
1:35

LEGEND NOTE: THE LEGEND NEXT TO THE US DOT LOGO SHALL BE ONE OF THE FOLLOWING BASED ON PROJECT FUNDING SOURCE:

0.67" Font: 0.66" Century Gothic (Bold) U.S. Department of Transportation Federal Highway Administration
 0.67" Font: 0.66" Century Gothic (Bold) U.S. Department of Transportation FTA
 0.67" Font: 0.66" Century Gothic (Bold) U.S. Department of Transportation FRA
 0.67" Font: 0.66" Century Gothic (Bold) U.S. Department of Transportation NHTSA



See CT DOT logo & legend for details

US DOT Logo shown on separate page

REV'D 01/23

Dimensions are in Inches
 Material : 0.125" Thick Sheet Aluminum
 Ground Mounted

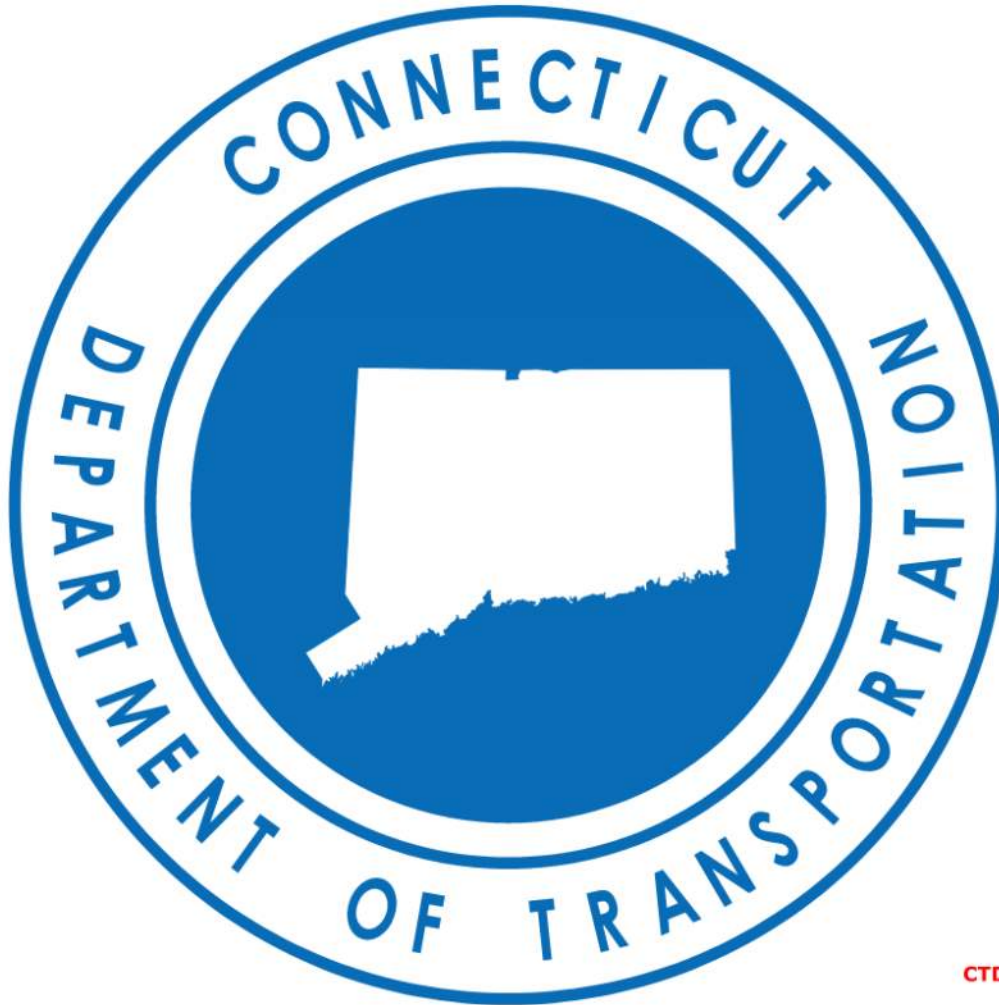
File name: TP1550

Printed: 01/19/23

SIGN NUMBER	TP1550
PANEL SIZE	8'-0" x 5'-0"
TOTAL AREA	40.0 Sq.Ft.
MUTCD	N/A
BDR INSET/WIDTH	0" / 0.75"
CORNER RADIUS	3"
BACKGROUND	TYPE: IX COLOR: Green
LEGEND/BORDER	TYPE: IX COLOR: White/White
* REFER TO CATALOG OF SIGNS FOR SHEETING TYPE. WHEN COLOR IS BLACK TYPE IS "PLAIN".	

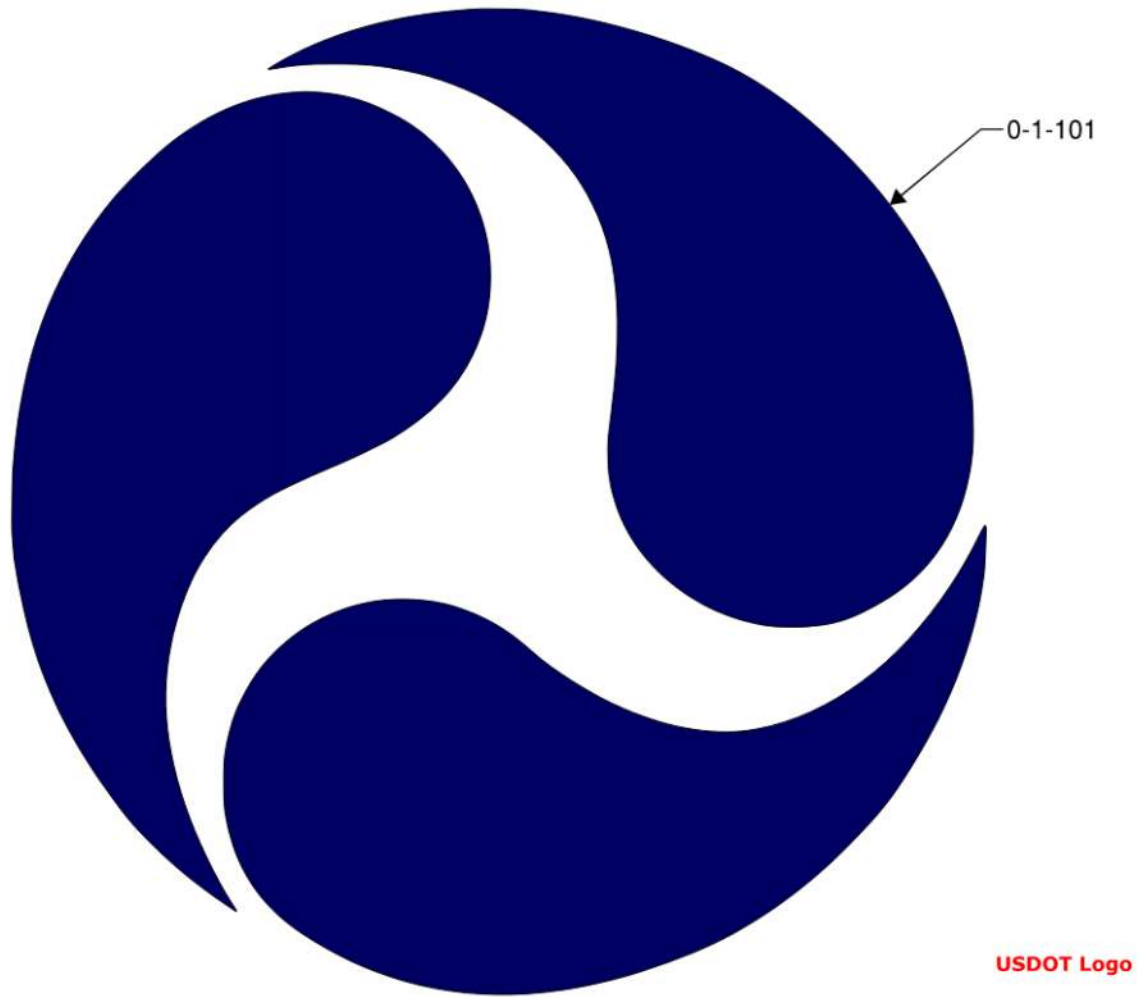
SYMBOL	ROT	X	Y	WID	HT
CT DOT LOGO	0	3.5	3.5	19	7
US DOT LOGO	0	73.5	3.5	19	7

LETTER POSITIONS (X)															LENGTH	SERIES/SIZE							
P	R	O	J	E	C	T	F	U	N	D	E	D	B	Y	T	H	E				D 2000		
5,8	9,9	14,1	18,3	22,7	26,5	30,6	37,7	41,5	46,1	50,7	55,2	59,2	66,6	70,4	78,7	82,6	87,2			84,5	5		
B	I	p	a	r	t	I	s	a	n														
3,4	7,6	9,6	13,2	17,1	19,2	21,8	23,4	26,2	30,2														
I	n	f	r	a	s	t	r	u	c	t	u	r	e	L	a	w						D 2000	
36,1	38,2	41,8	44,3	46,6	50,2	52,8	55,4	57,9	61,8	65	67,6	71,6	74	79,9	83,5	87					89,3	5/3.8	
B	U	I	L	D	I	N	G	A														Arrial Black	
25,8	30,8	36,4	39	43,4	48,5	51,2	56,4	65														44,1	4,5
B	E	T	T	E	R	A	M	E	R	I	C	A										Arrial Black	
13,5	18,9	23,5	28,3	33,6	38,8	47,2	52,9	59,5	64,6	70	72,8	77,6										69	4,5
B	U	I	L	D	.	G	O	V														D 2000	
41,1	42,9	44,8	45,5	47,2	48,9	49,5	51,4	53,2														13,8	2,3



CTDOT Logo

Link to .dgn file: [CTDOT_logo.dgn](#)



Link to .dgn file: [USDOT_logo.dgn](#)

ITEM #1301017A – FURNISH AND INSTALL 8” WATER MAIN ON BRIDGE

ITEM #130861A – FURNISH DUCTILE IRON PIPE, VALVES AND MISCELLANEOUS FITTINGS (WATER MAIN)

Reference to “Department” in this Item refers to “Bristol Water Department”.

Description: The Work specified in this Section includes furnishing and installing ductile iron pipe, fittings and appurtenances of the sizes indicated to the lines and grades shown on the Contract Drawings complete as shown, specified or directed. The work includes, but is not limited to, furnishing, installing and field testing ductile iron (standard and pre-insulated) pipelines to the extents identified on the plans, complete with lacings and harnessing, joint restraint, thrust blocks and anchors, tapping sleeves, tapping gate valves, gate / butterfly valves, air valves, chlorination inlet / blow off, gate valve boxes, blow off assemblies, bends, tees, utility identification tape, casing sleeve with end seals, casing spacers, pressure reducing valves, vaults, excavating test pits, transporting materials, clearing, trenching, disposing of unused excavated materials, water mains or other abandoned utilities and concrete blocks, rock removal, removing concrete road base, backfilling trenches, furnishing additional material for backfilling, trench compaction and testing, traffic control, temporary and permanent surface restoration, miscellaneous grading, resetting miscellaneous items, sheeting bracing, pumping and all incidental work where required except as otherwise provided for.

Materials: All materials used shall be from manufacturers and models as approved by Bristol Water Department unless otherwise approved by the Engineer.

MECHANICAL JOINT DUCTILE IRON PIPE

Submittals: The manufacturer's literature and/or shop drawings for the materials of this section shall be submitted for approval. The Contractor shall furnish detailed drawings as follows and no work shall be fabricated until they have been approved by the Engineer:

1. Dimensions and general details for typical length of pipe.
2. Detail of joint between pipes for both push-on and restrained joints together with installation instructions.
3. Dimensions and general details for all fittings including joint details for both mechanical and restrained joints.
4. Location plans or lists showing number of pipes and fittings and other such information as needed for installation.

A certified statement that inspection and all of the specified tests have been made and met shall also be submitted.

References

The following standards based on the latest edition form a part of this specification as referenced:

ANSI/AWWA C110/A21.10 – American National Standard for Ductile-Iron and Gray-Iron Fittings, 3-Inch through 48-Inch, for Water and Other Liquids

ANSI/AWWA C111/A21.11 – American National Standard for Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings

ANSI/AWWA C151/A21.51 – American National Standard for Ductile-Iron Pipe Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water and Other Liquids

ANSI/AWWA C153/A21.53 – American National Standard for Ductile-Iron Compact Fittings, 3-Inch through 48-Inch (75 mm through 300mm), for Water and Other Liquids

ANSI/AWWA C600 – AWWA Standard for Installation of Ductile Iron Water Mains and their Appurtenances

DIPRA's Installation Guide for Ductile Iron Pipe

The Bristol Water Department Standard Details

Quality Assurance

All pipe and fittings shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured.

All pipe and fittings shall be subject to inspection by the Engineer after delivery to the job site and may also be subject to inspection at the foundry by a representative of the Department.

In addition, the Department reserves the right to have any or all pipe, fittings and special castings inspected and/or tested by an independent service at either the manufacturer's plant or elsewhere. Such inspection and/or tests shall be at the Department's expense.

Ductile Iron Pipe

The ductile iron pipe shall conform to ANSI/AWWA C151/A21.51, ANSI/AWWA C111/A21.11, ANSI/AWWA C104/A21.4 and the following additional requirements:

All pipe for water shall be Class 54.

All pipe shall be lined with double-thickness, cement-mortar in accord with ANSI/AWWA C104/A21.4.

All pipe shall have push - on joints employing a single elongated grooved rubber gasket as specified in ANSI/AWWA C111/A21.11, unless otherwise specified.

The restrained joint pipe shall employ ductile iron locking segments inserted through slots in the bell face and a retainer weldment on the spigot end of the pipe to provide a positive axial lock, or an equivalent restraining method. The restrained joint pipe shall be as manufactured by the American Cast Iron Pipe Company, McWane, Super Lock, TR Flex by U.S. Pipe and Foundry Co., or approved equal.

Restrained joint pipe that is cut in the field to fit into a restrained joint pipe bell shall be provided with a field applied retainer weldment on the field cut spigot end or special gripper rings provided by the restrained joint pipe manufacturer for that specific purpose.

All pipe will be coated inside and outside with an approved bituminous material in accordance with ANSI/AWWA C104/A21.4 and ANSI/AWWA C151/A21.51.

The grade of ductile iron shall be 60-42-10.

All pipe shall be marked in accord with ANSI/AWWA C151/A21.51.

All requirements of the American National Standards Institute Specifications will be rigidly enforced.

The grooved rubber gaskets and joint lubricant shall be furnished with the pipe. The gasket shall be plainly identified as to pipe size and packaged in a suitable and satisfactory manner for shipment.

All joint accessories shall be furnished with each pipe and shall be plainly identified as to pipe size.

THE FOLLOWING ARE ACCEPTABLE PIPE MANUFACTURERS:

American Cast Iron Pipe Company (ACIPCO)
McWane Ductile
United States Pipe & Foundry Co.

DUCTILE-IRON OR GRAY-IRON FITTINGS

The ductile iron or gray iron fittings shall conform to ANSI/AWWA C110/A21.10, ANSI/AWWA C111/A.21.11, ANSI/AWWA C104/A21.4, ANSI/AWWA C153/A21.53 and the following additional requirements:

All fittings shall be lined with double-thickness cement-mortar in accord with ANSI/AWWA C104/A21.4, except sleeves, caps, and plugs.

All fittings will be coated inside and outside with an approved bituminous material in accord with ANSI/AWWA C104/A21.4 and Section 10-9 of ANSI/AWWA C110/A21.10. All fittings shall have mechanical joints as specified in ANSI/AWWA C111/A21.11.

All cast and ductile iron fittings shall have a pressure rating of at least 150 psi.

Bolt holes in the mechanical joint bells of all fittings shall straddle the vertical centerline of the fitting (laying in horizontal position).

All joints accessories shall be furnished with each fitting and shall be plainly identified as to size.

Compact ductile iron fittings that meet AWWA Specifications may be used if approved by the Engineer.

MECHANICAL JOINT RESTRAINT

Restraint devices for mechanical joint fittings and appurtenances conforming to either ANSI/AWWA C111/A21.11 or ANSI/AWWA C153/A21.53 shall conform to the following:

Restraint devices for nominal pipe sizes 3 inch through 48 inch shall consist of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of ANSI/AWWA C110/A21.10.

The devices shall have a working pressure rating of 350 psi for 3-16 inch and 250 psi for 18-48 inch. Ratings are for water pressure and must include a minimum safety factor of 2 to 1 in all sizes.

Gland body, wedges and wedge actuating components shall be cast from grade 65-45-12 ductile iron material in accordance with ASTM A536.

Ductile iron gripping wedges shall be heat treated within a range of 370 to 470 BHN.

Three (3) test bars shall be incrementally poured per production shift as per Underwriter's Laboratory (U.L.) Specifications and ASTM A536. Testing for tensile, yield and elongation shall be done in accordance with ASTM E8.

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Chemical and nodularity tests shall be performed as recommended by the Ductile Iron Society, on a per ladle basis.

An identification number consisting of year, day, plant and shift (YYDDD) (plant designation) (Shift number), shall be cast into each gland body.

All physical and chemical test results shall be recorded such that they can be accessed via the identification number on the casting. These Material Traceability Records (MTR's) are to be made available, in hard copy, to the purchaser that requests such documentation and submits his gland body identification number.

Production pieces that are too small to accommodate individual numbering, such as fasteners and wedges, shall be controlled in segregate inventory until such time as all quality control tests are passed. These component parts may then be released to a general inventory for final assembly and packaging.

All components shall be manufactured and assembled in the United States. The purchaser shall, with reasonable notice, have the right to plant visitation at his/her expense.

Mechanical joint restraints shall require conventional tools and installation procedures per AWWA C600, while retaining full mechanical joint deflection during assembly as well as allowing joint deflection after assembly.

Proper actuation of the gripping wedges shall be ensured with torque limiting twist off nuts.

Restraint devices shall be Listed by Underwriters Laboratories (3" through 24" inch size) and Approved by Factory Mutual (3" through 12" inch size).

Mechanical joint restraints shall be Megalug Series 1100 produced by EBAA Iron Inc., Uni-Flange Series 1400 produced by Ford Meter Box Co., Style 612 produced by Romac, Stargrip Series 3000 produced by Star Pipe Products or approved equal.

12-INCH AND SMALLER GATE VALVES

Submittals

In accord with the General Conditions, six (6) sets of the manufacturer's literature and/or shop drawings for the materials of this section shall be submitted for approval.

A certified statement that inspection and all of the specified tests have been made and met shall also be submitted.

References

The following standards based on the latest edition form a part of this specification as referenced:

ANSI/AWWA C111/A21.11 - American National Standard for Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings

ANSI/AWWA C500 - American National Standard for Gate Valves for Water and Sewerage Systems

ANSI/AWWA C509 - American National Standard for Resilient - Seated Gate Valves for Water and Sewage Systems

ANSI/AWWA C550 – Protective Epoxy Interior Coatings for Valves And Hydrants.

ASTM A 36 - Standard Specification for Structural Steel

ASTM A 123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings

ASTM A536 - Standard Specification for Ductile Iron Castings

Quality Assurance

All gate valves, accessories and gate valve boxes shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured.

A certified statement that inspection and all of the specified tests have been made and met shall also be submitted at the time of delivery.

All gate valves, accessories and gate valve boxes shall be subject to inspection by the Engineer after delivery to the job site and may also be subject to inspection at the foundry by a representative of the Department.

In addition the Department reserves the right to have any or all materials inspected and/or tested by an independent service at either the manufacturer's plant or elsewhere at the Department's discretion. Such inspection and/or tests shall be at the Department's expense.

Gate Valve

The gate valve shall conform to ANSI/AWWA C500, ANSI/AWWA C509 and the following additional requirements:

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Valve shall be resilient sealed.

Body and bonnet shall be constructed of ASTM A536 ductile iron.

Wedges shall be constructed of ASTM A536 ductile iron and encapsulated with EPDM.

All other materials not specified shall be as specified in ANSI/AWWA C500 and C509.

Bolts and nuts for connecting O-ring seal plates and bonnet to body shall be stainless steel.

Valve shall be furnished with O-ring seals utilizing two O-rings, consistent with appropriate specifications. Valve shall be capable of having O-rings replaced while the valve is under pressure.

Valve shall have mechanical joint ends, unless otherwise specifically indicated, which shall conform to ANSI/AWWA C111/A21.11. All joint accessories shall be furnished with each valve.

Valve shall be non-rising stem.

Direction to open (right-hand or left-hand) shall be as shown in the Contract Drawings and the Bristol Water Standard Details.

Operating nut shall be 2" square.

Valve, linings, and coatings shall conform to NSF Standard 61.

Valve shall have a working pressure rating of 250 psi.

Provide all internal and external wetted parts coated with a fusion bonded epoxy in accordance with ANSI/AWWA C550.

Gate Valve box

The gate valve box shall conform to the following requirements:

Cast iron shall conform to ASTM A-48, Class 25 "Dwyer" Style, ISO 9000 or domestic.

Top section shall be of the top flange design and shall have no bead on the bottom.

The word "WATER" shall be cast with raised letters in the center of the cover.

Base section shall be of the Dwyer design which centers the operating nut for positive access to the valve.

For specific gate valve box details, see the Contract Drawings and the Bristol Water Department Standard Details.

Ten (10") inch gate valve box to be used for 10" gate valve and greater.

Extension Stem

The extension stem shall be fabricated from stainless steel conforming to ASTM A 36. Galvanizing shall conform to the latest edition of ASTM A 123.

BLOW OFF ASSEMBLY

Submittals

In accord with the General Conditions, six (6) sets of the manufacturer's literature and/or shop drawings for the materials of this section shall be submitted for approval.

A certified statement that inspection and all of the specified tests have been made and met shall also be submitted.

References

The following standards based on the latest edition form a part of this specification as referenced:

The Bristol Water Department Standard Details Manual

Quality Assurance

All blow-off assemblies including gate valves and fittings shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured.

All blow-off assemblies including gate valves and fittings shall be subject to inspection by the Engineer after delivery to the job site and may also be subject to inspection at the foundry by a representative of the Department.

In addition, the Department reserves the right to have any or all blow-off assemblies including gate valves, fittings and special castings inspected and/or tested by an independent service at either the manufacturer's plant or elsewhere. Such inspection and/or the tests shall be at the Department's expense.

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Gate Valve Box

The gate valve box shall conform to the following requirements:

Cast iron shall conform to ASTM A-48, Class 25, "Dwyer Style ISO 9000 or domestic.

Top section shall be of the top flange design and shall have no bead on the bottom.

The word "WATER" shall be cast with raised letters in the center of the cover.

Base section shall be of the Dwyer design which centers the operating nut for positive access to the valve.

UNDERGROUND WARNING TAPE

The non-detectable warning tape shall be polyethylene tape manufactured in accordance with the following technical data:

TECHNICAL DATA

<u>PROPERTIES</u>	<u>TEST METHOD</u>	<u>VALUE</u>
Thickness	ASTM 02103	0.004" (4 mils)
Elongation	ASTM D882-75B	> 400%
Tensile Strength	ASTM 0882	MD: 1830 psi TO: 2350 psi

Tape shall be 6 inches wide.

The warning tape shall be heavy gauge 0.004 inch polyethylene and shall be resistant to acids, alkalis and other soil components. It shall be highly visible in the following colors with the associated phrases stamped in black letters and repeated at a maximum interval of 40 inches.

<u>Type of Utility</u>	<u>Color</u>	<u>Warning Message</u>
Water	Blue	Caution – Water Line Buried Below

The tape shall be of the type specifically manufactured for marking and locating utilities.

Casing Pipe

Submittals

In accord with the General Conditions, six (6) sets of the manufacturer's literature and/or shop drawings for the materials of this section shall be submitted for approval.

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A certified statement that inspection and all of the specified tests have been made and met shall also be submitted.

References

The following standards based on the latest edition form a part of this specification as referenced:

American National standards Institute (ANSI)

AWWA C200: Standard for Steel Water Pipe Six inches and Larger

AWWA C210-08 – Standard for Liquid Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines

AWS D1.1 – Structural Welding Code – Steel

The Bristol Water Department standards

Quality Assurance

Steel pipe shall be the product of a single domestic manufacturer. Pipe shall be tested and inspected at the foundry as required by ASTM A53 and as required by the standard specifications to which the material is manufactured.

Casing pipe shall be electric resistance weld steel pipe conforming to ASTM A53B and AWWA C200. Steel pipe shall have minimum yield strength of 35,000 psi. The inside diameter of the casing pipe shall be twenty (20) inches with a minimum of three (3) inches greater than the largest outside diameter of the carrier pipe, joints or coupling and have a minimum wall thickness of 0.500 inches.

The steel pipe shall have two coats of black coal tar epoxy on the interior and exterior in accordance with AWWA C210.

Casing pipe ends shall be beveled with a single V-groove for field welding. Pipe joints shall be butt-welded and shall be a full penetration on the outside circumference of the pipe. The single V-groove butt weld shall conform to the latest AWS Welding Code. All joints of the casing pipe shall be butt-welded, by a certified welder, prior to being installed.

Casing Spacers

Casing spacers shall be provided and installed where shown on drawings and in accordance with these specifications. The spacer insulator “system” shall be designed and fabricated for the specific project and application for which they are furnished.

The casing spacer shall have a minimum 14-gauge 304 stainless steel band. Bands shall be two segments, 8-inch wide.

Grade 304 stainless steel, minimum 10 gauge thickness stainless steel risers shall be fabricated to support the carrier pipe and its liquid load. Risers shall be sized to restrain and position the carrier pipe in the center of the casing, support all loads and provide proper contact for the isolation function.

The casing spacers/isolators shall have a flexible PVC liner of 0.09-inch thickness with a Durometer "A" 85-90 hardness and a min. 50,000-volt dielectric strength

Runners shall be of high pressure molded Glass Reinforced Polymer with a minimum compressive strength of 18,000-psi, 2-inch in width and a minimum of 7-inches long. Polyethylene runners are not an acceptable alternative.

The band section shall be bolted together with 304 stainless steel studs, nuts and washers. Hardware shall be 5/16-inch.

Each spacer/isolator shall be manufactured at a facility that has a Registered ISO 9001:2000 Quality Management System. Copy of current ISO 9001:2000 Registration shall be provided with material submittal.

Stainless steel casing spacers with risers shall be Model SSI Centered and Restrained as manufactured by Advance Products & Systems, Inc. (APS), Model CCS Centered and Restrained as manufactured by Cascade Waterworks Mfg. or approved equal.

Construction Methods:

PRE-INSULATED DUCTILE IRON PIPE

It is the intent of the design that the hanger system be installed similar to its existing configuration under the final conditions. The Contractor is responsible for inspecting the existing hanger system prior to removal of the existing water main to confirm locations of hangers and configuration. Portions of the hanger system may be reused at the direction of the Engineer and Bristol Water Department. The salvaged/new hanger system shall be installed according to original configuration and be in place prior to installing the pre-insulated ductile iron pipe beneath the bridge. Prior to setting pipe within hanger system, pre-insulated pipes and fittings shall be subjected to a careful inspection just before being laid or installed.

The pre-insulated ductile iron pipe shall be installed from back of abutment wall to back of abutment wall through provided penetrations in the reconstruction back wall and utilizing the hanger system and rollers already installed. The Contractor shall coordinate with Bristol Water Department and the Engineer prior to installation of the pre-insulated ductile iron pipe

MECHANICAL JOINT DUCTILE IRON PIPE

Prior to pipe-laying, the Contractor shall dig test pits where the new pipe connects to the present water main to ascertain the location, elevation and cross sectional dimensions of the present mains.

Pipes and fittings shall be subjected to a careful inspection and a hammer test just before being laid or installed.

The pipe and fittings shall be transported from the place of manufacture, all permits which may be necessary shall be secured and the requirements of the Connecticut Department of Transportation, cities and towns, concerning heavy transporting over state, city and town highways shall be complied with.

During loading, transporting and unloading, more than ordinary care shall be taken to prevent injury to the pipes. Such work shall be done with each section of the pipe under the full control at all times and under no conditions shall a pipe be dropped on the ground. Pipes shall be placed on sand beds or other methods may be employed to avoid chances of the pipe being frozen to the ground surface. The ends of pipe shall be plugged or cupped to prevent entering water, materials, animals, etc.

In distributing the pipes in the field, as permitted, each piece shall be placed as near as possible to the point where it is to be installed and faced in the proper direction. In case any pipe should be damaged from handling or other cause and made unacceptable to the Engineer, it shall be replaced with a new pipe at no additional cost to the Department. The Contractor is cautioned that state, city authorities may not permit storing pipe, etc., within street or highway limits.

Pipe and accessories shall be handled to ensure delivery to the trench in sound, undamaged condition, including no injury to the pipe coating or lining. If the coating or lining of any pipe or fitting is damaged, the repair shall be made by the Contractor in a satisfactory manner, at no additional cost to the Department. No other pipe or material shall be placed inside a pipe or fitting after the coating has been applied. Pipe shall be carried into position and not dragged. Use of pinch bars and tongs for aligning or turning pipe will be permitted only on the bare ends of the pipe. The interior of pipe and accessories shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations by plugging or other approved method. Before installation, the pipe shall be inspected for defects. Material found to be defective before or after laying shall be replaced with sound material without additional expense to the Department. Rubber gaskets that are not to be installed immediately shall be stored in a cool and dark place.

No trees within streets and highways, or adjacent to the normal trench therein, shall be damaged or removed unless so ordered by the Engineer. Any requirements in any permit relative to trees shall be adhered to.

In streets and highways where there is no permanent paving, only those trees, bushes or shrubs shall be removed and disposed of as may be required for construction and as approved by the Engineer. The unlimited removal of trees and brush will generally not be required or permitted.

Pavements shall be cut by suitable methods as approved by the governing authority having jurisdiction.

Laying Ductile Iron Pipe

In general, trenching for the installation of the pipeline(s) shall be in accord with Contract Documents. Proper and suitable tools and appliances for safe and convenient handling and laying of pipe shall be used, and care shall be taken to prevent coating from being damaged, particularly on the inside of the pipes.

Pipe and accessories shall be carefully lowered into the trench by means of derrick, ropes, belt slings, or other authorized equipment. Water-line materials shall not be dropped or dumped into the trench. Abrasion of the pipe coating shall be avoided. Except where necessary in making connections with other lines or as authorized by the Engineer, pipe shall be laid with the bells facing in the direction of laying. The full length of each section of pipe shall rest solidly upon the pipe bed, with recesses excavated to accommodate bells, couplings, and joints. Pipe that has the grade or joint disturbed after laying shall be taken up and relayed. Pipe shall not be laid in water or when trench conditions are unsuitable for the work. Water shall be kept out of the trench until joints are complete. When work is not in progress, open ends of pipe, fittings, and valves shall be securely closed so that no trench water, earth, or other substance will enter the pipes or fittings. Where any part of the coating or lining is damaged, the repair shall be made by and at the Contractor's expense in a satisfactory manner in accord with the pipe manufacturer's recommendations. Pipe ends left for future connections shall be valved, plugged, or capped, and anchored, as shown.

Pipe work shall not be started until the following minimum equipment is available and on site:

Wheel pipe cutters, hydraulic pipe cutter or a pipe saw for the sizes of pipe to be laid;

Ratchet type socket wrenches for mechanical joint bolt and nuts;

At least two expandable pipe stoppers of the proper size for closing the end of the piping being laid when not actually laying pipe.

All pipes shall be carefully examined for defects and no pipe or other casting shall be laid which is known to be defective, and should any defective pipe or other casting be discovered after

being laid, it shall be removed and replaced with a sound casting at no additional cost to the Department.

The pipe shall be laid upon sound soil, cut true and even, so that the barrel of the pipe will have a bearing for its full length. In the event the trench is excavated below the grade of the bottom of the pipe, the trench will be brought up to grade with gravel, pneumatically tamped, before the pipe is laid. Should rock/ledge be occasioned said materials shall be removed and the pipe shall be installed on compacted sand bedding minimum 6" in depth from the lowest project of the pipe in accord with Contract Documents.

The underground warning tape shall be placed approximately two (2) feet above the top of the pipe.

When not actually laying pipe (e.g. overnight, weekends, holidays, etc.) the open ends of the pipe shall be kept plugged with approved watertight end caps.

All necessary precautions shall be taken to prevent water from entering the pipe during installation of the pipeline.

Unless directed otherwise by the Engineer all the following criteria shall be applied:

The pipeline shall be installed a minimum of four (4) feet - six (6) inches below finished grade.

The pipeline shall also be installed to provide at least eighteen (18) inches of vertical clearance between the water pipe and storm drains or sanitary sewers.

When vertical clearance cannot be met concrete separation shall be installed as directed by the Engineer.

Cutting Pipe

Whenever the pipes require cutting, an approved saw, wheel or hydraulic type cutter shall be used. This work shall be done at no additional cost to the Department, in a manner satisfactory to the Engineer, and only experienced men shall be engaged thereon.

Joints

On pipe with rubber gasket push-on joints, the gasket shall be installed in the socket of the pipe previously laid and the gasket then lubricated. The plain end of the pipe being laid shall then be inserted and pulled or pushed to the full depth of the socket. An approved jack-type tool shall be used to assemble pipe 10-inches and larger. Plain ends of cut pipe shall be filed or ground to a taper to prevent damage to the gasket during the insertion.

On fittings, butterfly and gate valves with mechanical joints, the follower ring and rubber gasket shall be placed on the plain end of the pipe being (or previously) laid and entered into the socket of the fitting. The gasket shall then be evenly seated in the socket, the follower ring moved up to the face of the gasket and the "T" bolts inserted and made finger-tight. The "T" bolts shall then be tightened with a ratchet or torque wrench as indicated in the manufacturer's instructions for installing the restrain system.

All mechanical joint style restrained joint fittings shall be installed in accordance with manufacturer recommendations, and as described below:

Where shown on the Contract Drawings, Contractor shall conduct test pits on existing fittings to confirm presence of joint restraint. Contractor shall also re-torque all bolts on existing fittings to confirm proper restraint.

Mechanical or pneumatic methods cannot be used to torque off nuts (where applicable). All twist-off nuts shall be hand tightened using a clockwise only turning socket wrench,

Restrained joint fittings cannot be backfilled until inspection by Bristol Water Department.

Contractor shall collect all torqued nuts from restrained joint installations. Department reserves the right to request Contractor to provide torqued nuts for proof of proper installation.

Where shown on the Contract Drawings, Contractor shall coordinate with Department to shut down existing main during tie-in work. A minimum of 14 day notice shall be provided to Engineer in advance of this work.

The maximum allowable deflection shall be as given in AWWA C600. If the alignment requires deflection in excess of the above limitations, special bends or a sufficient number of shorter lengths of pipe shall be furnished to provide angular deflections within the limit set forth.

Thrust Restraint

Plugs, caps, tees, reducers and bends deflecting more than the allowable deflection as given in AWWA C600, either vertically or horizontally, on waterlines 4 inches in diameter or larger, and fire hydrant laterals, shall be provided with thrust restraints. Valves shall be securely anchored or shall be provided with thrust restraints to prevent movement. Thrust restraints shall be either thrust blocks or, for ductile-iron pipes, restrained joints as detailed in the Bristol Water Department requirements or directed by the Engineer.

Thrust blocking shall be concrete of a mix not leaner than: 1 cement, 2-1/2 sand, 5 gravel; and having a compressive strength of not less than 2,000 psi after 28 days. Blocking shall be placed between solid ground and the hydrant or fitting to be anchored. Unless otherwise indicated or

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directed, the base and thrust bearing sides of thrust blocks shall be poured directly against undisturbed earth. The sides of thrust blocks not subject to thrust may be poured against forms. The area of bearing shall be as shown or as directed. Blocking shall be placed so that the fitting joints will be accessible for repair. Steel rods and clamps, protected by galvanizing or by coating with bituminous paint, shall be used to anchor vertical down bends into gravity thrust blocks. Where any section of a water line is provided with concrete thrust blocking for fittings or hydrants, the hydrostatic tests shall not be made until at least 7 days after installation of the concrete thrust blocking and providing that the concrete thrust blocking had a minimum compressive strength of not less than 2,000 psi after 7 days or unless otherwise approved by the Engineer.

The restraint system for push-on joint pipe and mechanical joints shall be installed in full accord with the recommendations of the manufacturers and as approved by the Engineer.

Cleaning

Before, and after, if required, the installation of the pipeline, but prior to filling the line with water, the interior of the pipelines shall be cleaned to the satisfaction of the Engineer, by such means as the Engineer approves.

Field Testing

Prior to disinfection, the pipeline shall be tested for leakage between test bulkheads and/or main line valves. The pipeline will be filled with water and tested in accord with the latest ANSI/AWWA C600 under a pressure of 150 psi at the lowest point in the pipeline. Under the test pressure, all visible leaks shall be made tight to the satisfaction of the Engineer. The total leakage per 24 hours from the line thus tested shall not exceed the allowed leakage as determined by the Engineer based on the latest ANSI/AWWA C600. Visible leaks shall be repaired even though the total leakage of the portion in question may be less than the above-mentioned permissible limit. Test pressure shall be applied for at least two hours and as much longer as required to permit inspection for leaks. Should the leakage exceed the maximum specified amount and investigation show this leakage to be at the joints or caused by defective work elsewhere, such defective work shall be repaired to the satisfaction of the Engineer or, if he so orders, the pipe or pipes shall be replaced at no additional cost to the Department and repairs or replacement shall be continued and the test repeated until the leakage under the test pressure is within the limit prescribed and the work left in a manner entirely satisfactory to the Engineer.

The Contractor shall be responsible for any damage to the pipeline or to adjoining property due to the testing.

Disinfecting and Flushing Water Mains

The Work specified in this Section describes continuous feed method of disinfecting newly constructed potable-water mains. The Contractor installing water mains and appurtenances such as pipe, valves, fittings and accessories within the Department service area is responsible for disinfecting the water main and pipe sections. The Department requires the Contractor to adhere to the strict standards stipulated in latest edition of AWWA C651, "Standard for Disinfecting Water Mains" when performing disinfection procedures. The standards represent the physical, chemical and bacteriological parameters that must be satisfied prior to determining if newly installed water mains can be placed into service.

The Contractor installing water mains and appurtenances within the Department service area is responsible for all operations related to disinfecting water mains and pipe sections smaller than 16-inches in diameter, except for work related to the existing distribution system. This work shall also include dechlorination and flushing of water mains. The gates within the existing distribution system shall be operated only by the Department. The Department shall provide disinfection solution and injection of disinfection solution for all water mains 16-inches in diameter and larger. The Department shall also provide services related to the dechlorination of water mains larger than 16-inches in diameter. The Contractor will be required to provide all labor and appurtenances required to direct flushing discharge to an approved disposal location for all water mains, regardless of pipe size. Flushing discharge to existing combined sewers shall be limited and quantity of flows restricted so as not to trigger an overflow condition. The Contractor shall be required to issue a submittal for the Subcontractor that will be performing the chlorine injection. The submittal shall include a minimum of three disinfection jobs of equal size and scope within the last two years and three references with contact information to establish the minimum level of required experience to perform the chlorine injection on the project. The Contractor shall be allowed to proceed with the implementation of this Section only if the submittal has been approved by the Department.

After flushing and subsequent to performing the disinfection operation, the Department will collect and analyze two complete sets of water samples. The two sets of water samples will be collected approximately twenty-four hours apart from each other. The first sample will be taken 2 hours after flushing and the second sample 24 hours after the first sample. Anticipate approximately two business days for sampling and test results. The Department will compare the results from the water samples collected to the maximum allowable limits for each parameter. If all parameters are satisfactory then the water main is considered to have passed and can now be opened for service. It is important to note that if any one parameter fails then two additional water samples will be collected twenty-four hours apart from each other. The parameters used to compare to the water sample results are listed in Table 1.

Use of Department supplied water for flushing purposes may be limited during periods of high demand or when temperatures exceed 95 degrees Fahrenheit.

Submittals

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The Contractor shall be responsible for developing a detailed plan that discusses at a minimum the scouring full pipe diameter flushing, methods for handling the volume of water from the flushing operation, disinfecting procedure with liquid sodium hypochlorite solution, de-chlorination procedure and sampling for each section of new water main to be tested. The Contractor shall provide a detailed submittal to the Engineer and Department that outlines the specifics of the proposed procedures for each location.

References

The following standards based on the latest edition form a part of this Specification as referenced:

ANSI/AWWA C651-99 – AWWA Standard for disinfecting water mains

Sodium Hypochlorite Solution

Sodium hypochlorite conforming to ANSI/AWWA B300 is available in liquid form in glass, rubber-lined or plastic containers typically ranging in size from 1 quart to 5 gallons. Sodium hypochlorite contains approximately 5% to 15% available chlorine, and the storage conditions and time must be controlled to minimize its deterioration.

EXECUTION

General

The sanitary handling of materials, the practices during construction, and the continual inspection of the work are the primary means for ensuring the sanitary condition of the water main. The effectiveness of disinfection depends on maintaining clean pipes and avoiding major contamination during construction activities.

PREVENTATIVE AND CORRECTIVE MEASURES DURING CONSTRUCTION

Heavy particles generally harbor bacteria and prevent elevated chlorine concentrations from contacting and killing these organisms. The procedures of this Specification must be observed to assure that a water main and its appurtenances have been thoroughly cleaned for the final disinfection by chlorination. Also, any connection of a new water main to the active distribution system prior to the receipt of satisfactory physical and bacteriological sample results may constitute a cross-connection. Therefore, new water mains must be isolated until physical and bacteriological tests, immediately after and 24 hours following flushing of the water main, are satisfactorily completed and meeting Department specifications.

Keeping Pipe Clean and Dry: A successful disinfection process begins at the early stages of construction. The Contractor must protect piping systems from contamination including interiors of pipes, fittings and valves. Pipe and appurtenances delivered for construction shall be capped

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or bagged to minimize the entrance of foreign material. All openings in the pipeline shall be closed with watertight plugs when pipe laying is stopped at the close of the day's work or for other reasons, such as rest breaks or meal periods. Rodent-proof plugs may be used when watertight plugs are not practicable and when thorough cleaning will be performed by flushing or other means. The sanitary handling of materials, the practices during construction, and the continual inspection of the work are the primary means for ensuring the sanitary condition of the water main.

Delay in placement of delivered pipe invites contamination. The more closely the rate of delivery is correlated to the rate of pipe laying, the lower the risk of contamination.

Joints: Joints of all pipes in the trench shall be completed before work is stopped. If water accumulates in the trench, the plugs shall remain in place until the trench is dry.

Sealing Materials: No contaminated material or any material capable of supporting prolific growth of microorganisms shall be used for sealing joints. Sealing material or gaskets shall be handled in a manner that avoids contamination. The lubricant used in the installation of sealing gaskets shall be suitable for use in potable water and approved by the pipe manufacturer, and not contribute odors. It shall be delivered to the job in closed containers and shall be kept clean and applied with dedicated, clean applicator brushes.

Cleaning and Swabbing: Each pipe section that is being readied for assembly in the field and just prior to installation, shall have the interior pipe surface swabbed with a 1% to 5% hypochlorite disinfecting solution using mechanical means like pulling a chlorine soaked mop or pigging device through the pipe or by power washing . If in the opinion of the Engineer, any dirt enters the pipe while being installed, the pipe will be swabbed again with 1% to 5%. The cleaning method used shall not force mud or debris into the interior pipe-joint spaces and shall be acceptable to the Engineer.

Wet Trench Construction: If it is not possible to keep the pipe and fittings dry during installation, the water that may enter the pipe-joint spaces shall contain an available chlorine concentration of approximately 25 mg/L. This may be accomplished by adding calcium hypochlorite granules or tablets to each length of the pipe before it is lowered into a wet trench or by treating the trench water with hypochlorite tablets.

Flooding by Storm or Accident During Construction: If the main is flooded during construction, it shall be cleared of the floodwater by draining and flushing with potable water until the main is clean. The section exposed to the floodwater shall then be filled with chlorinated potable water that, at the end of a 24-hour holding period, will have a free chlorine residual of not less than 25 mg/L. The chlorinated water may then be drained or flushed from the main.

Preflushing of Source Water

The source water used for disinfection and pressure testing shall be flushed prior to its use to ensure that normally occurring contaminants or debris are not introduced into the new water main pipe. The Department will be responsible for operating gate valves in the street as necessary. Adequate drainage must be provided during flushing, away from the construction area. The Contractor shall be responsible for constructing temporary discharge piping and/or materials as necessary, at no additional cost to the Department.

Field Testing

Refer to Ductile Iron Pipe Field Testing for field pressure testing procedures. This testing is to be satisfactorily completed prior to initiating the flushing/disinfection procedures covered in this Section.

Continuous Feed Method of Chlorination

Hypo-chlorination utilizes a concentrated dose of chlorine solution, usually 25 ppm for a 24 hour period, to eradicate bacterial contamination. This is a critical operation that requires skilled personnel and therefore the Department reserves his right to request the replacement of any Contractor/Subcontractor's personnel for lack of skills performing these tests. The Contractor shall not be compensated for the replacement of his Subcontractor or its personnel if requested by the Department as a result of lack of skills in performing these tests. These procedures allow for disinfecting a new section of the water distribution system, minimizing the risk to the field crews, to customers and to the environment. These procedures are to be followed when disinfecting all new pipelines which utilize the injection of sodium hypochlorite.

Final Flushing

After the applicable retention period of 24 hours, heavily chlorinated water should not remain in prolonged contact with the pipe. In order to prevent damage to the pipe lining or to prevent corrosion damage to the pipe itself, the heavily chlorinated water shall be flushed from the main, fittings, valves and branches until chlorine measurements show that the concentration in the main is no higher than that generally prevailing in the distribution system.

The Contractor shall make arrangements with the Department to flush the new water main following disinfection. Department forces shall be responsible for operating the gate valves in the street as necessary. It is important to note here that the new water main shall be kept isolated from the active distribution system using a physical separation until disinfectant has been flushed and satisfactory bacteriological, physical and VOC testing has been completed. Operation of all valves used in filling and flushing the line shall be performed by Department personnel.

The Contractor shall be responsible for supplying necessary materials, equipment and appurtenances for neutralizing the chlorine and to perform all flushing operations except the operating of gate valves within the existing water distribution system. The minimum materials and equipment required to flush and neutralize the water main are:

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Five 3-inch x 20-foot rubber hoses, each with 3-inch male x female Camlock Couplings.

Dechlorination device, model 3M-CLA.

Standard hydrant wrench.

90-degree ductile iron elbow with retaining gland, either 4 or 6-inch depending on blow off size.

Customized 4 or 6-inch, 3/8-inch thick metal plate that bolts on to the 90- degree ductile iron elbow with 2-1/2-inch male fire connection (NST) thread. 4 or 6-inch depends on the blow off size.

Ascorbic acid powder.

The Contractor shall also be responsible for determining where the water will drain during the flushing operation so as not to cause localized flooding or cause damage to property or the environment. The environment to which the chlorinated water is to be discharged shall be inspected. Following neutralization of the chlorinated water, the level of chlorine shall be between 0.1 and 0.8 mg/l and in no case higher than the chlorine level in the distribution system. It is important to note that during the summer month's water mains tend to take longer to disinfect due to higher ambient temperatures increasing the bacterial count. Usually, additional flushing will result in successfully disinfecting the water main.

Disinfection Tests

Following disinfection and flushing, Department forces will collect and analyze water samples from the new main utilizing a copper sterilization sampling fitting located no more than every 1,200 feet along the newly constructed water main. Two sets of water samples will be collected: the first approximately 2 hours following the flushing operation, and the second set of samples will be collected 24 hours after the first set of samples was taken. The results are available approximately two business days following collection. The analytical results for the samples will be compared to the maximum allowable limits for each parameter as established by the Department shown in Table 1. If the parameters are satisfactory for BOTH sets of water samples, then the water main is considered passing and can be opened for service.

To ensure the water sample integrity, the Department requires the person taking the sample to complete a "Chain of Custody" form, see attachment. This form must accompany the water sample when transporting to the Department's preferred testing facility.

Table 1

Physical, Chemical and Bacteriological Parameters for Water Mains

Parameter	Maximum Allowable Limit
pH	6.4 to 10
Color	15 units
Turbidity	1.0 NTU
Odor	2
Hardness	60 ppm.

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Specific Conductance	150 microhms at 25 oC
Coliform Bacteria	0 per 100 milliliters at 35% oC
Standard Heterotrophic Plate Count	< 500 per milliliter at 35 oC
Chlorine Residual	<0.1- 0.8 ppm.
Volatile Organic Compounds (VOC)	See C. Below

For VOC concentrations less than 100 ppb the water main is approved to be placed in service. For VOC concentrations of 100 to 200 ppb, the full volume of the water main will be flushed to remove the VOCs and the water main will be approved to be placed in service. For VOC concentrations over 200 ppb, the water main shall be re-sampled for VOC's, but not HPC's if the bacteriological samples passed the test.

Resampling

If the initial disinfection fails to produce satisfactory physical and bacteriological results for EITHER set of water samples, the new main shall be re-flushed and resampled (two sets of water samples).

If the new water main fails two rounds of sampling, the Department shall determine if re-disinfection is needed or if the new main should only be flushed.

ATTACHMENT-CHAIN OF CUSTODY FORM

Sample Collection \ Chain of Custody
Distribution Specials
New Mains

Project DVW (when applicable to Developer Permit Agreement):

Project Name (for all projects): _____

Town: _____

Sample I.D.	Location (street)	Size of Main	Length of Main
S1			
S2			
S3			
S4			

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Is a VOC being submitted? YES / NO

Time Collected

<u>S1</u>	<u>S2</u>	<u>S3</u>	<u>S4</u>
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Chlorine residual

<u>S1</u>	<u>S2</u>	<u>S3</u>	<u>S4</u>
------------------	------------------	------------------	------------------

Collected by _____

Any observations that might affect the physical and bacteriological quality of the water should be noted below:

Relinquished By:	Date / Time:
Received By:	Date / Time:
Relinquished By:	Date / Time:
Received By:	Date / Time:

12-INCH AND SMALLER GATE VALVES

Inspection before Installation

The gate valve, gate valve box, joint restraints etc. shall be subject to a careful inspection before being installed. The valve shall be run through a full open-close cycle to insure proper operation.

Installation of Gate Valve, Gate Valve Box and Joint Restraints

The gate valve shall be installed according to the details shown in the Contract Drawings, the Bristol Water Department requirements and to the satisfaction of the Engineer.

All debris and foreign material shall be cleared from valve openings and seats. All mechanisms shall be checked and all nuts and bolts checked for tightness.

The gate valve box shall be set plumb and centered directly over the operating nut of the valves. Earth fill shall be carefully tamped around the gate valve box to a distance of 4 feet on all sides or to the undisturbed trench face, if less than 4 feet.

Where and as shown on the Contract Drawings, or ordered, a valve extension stem shall be installed. An extension stem will be ordered when the valve-operating nut is more than 4.5' feet below finished grade.

Excavation, shoring, dewatering, and refill and traffic control shall conform to the requirements under other applicable Contract Sections.

BLOW OFF ASSEMBLY

Inspection before Installation

Blow-off assemblies including gate valves, pipe, fittings, gate valve boxes, etc. shall be subject to a careful inspection before being installed. Valves shall be run through a full open-close cycle to insure proper operation.

Installation of Blow Off Assembly

Blow-off assemblies including piping, gate valves, fittings, etc. shall be installed according to the details shown in the Contract Drawings, the Bristol Water Department requirements and to the satisfaction of the Engineer.

All debris and foreign material shall be cleared from valve openings. The blow-off assembly shall be set plumb. Blow-off assemblies and connecting pipe shall have at least the same depth of cover as the distributing main.

Trench refill shall be placed over the pipe and fittings from the bottom of the trench to 2 feet above the top of the pipe and fittings.

Ductile iron pipe and harnessing shall be installed in accordance with Contract Documents.

The underground warning tape shall be placed approximately two (2) feet above the top of the pipe.

Gate valves and gate valve boxes shall be installed in accordance with Contract Documents.

AIR VALVE / CHLORINATION INLET / BLOW OFF

Inspection before Installation

All tubing and fittings shall be carefully examined for defects and no material shall be installed which is known to be defective and should any defective tubing or fitting be discovered after being installed, it shall be removed and replaced with sound material at no additional cost to the Department.

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Installation of Air Valve / Sterilization Inlet / Blow Off

The air valves, sterilization inlet and blow-off shall be installed according to the details shown in the Contract Drawings, the Bristol Water Department requirements and to the satisfaction of the Engineer. To properly receive the air valve or other assembly the ductile iron pipe shall be drilled and tapped. All tapped holes for corporation stops shall be tapped Mueller Thread.

All tapped holes in ductile iron pipe shall be cleaned by running the correct size tap into the hole immediately prior to installing the corporation.

Gate valve boxes shall be set plumb and centered on the fitting, etc. Earth fill shall be carefully tamped around the gate valve box to a distance of 4 feet on all sides or to the undisturbed trench face, if less than 4 feet.

Chlorination inlet / blow off shall be removed once the water main passes all tests. Corporation shall either be converted to standard air valve or abandoned prior to final pavement restoration.

Excavation and refill shall conform to the requirements under other applicable Contract Sections.

UNDERGROUND WARNING TAPE

Installation of Underground Warning Tape

All buried pipe and fittings shall be installed with non-detectible underground warning tape located approximately 24" above top of pipe.

CASING PIPE

The casing pipe shall be installed by open trench.

Care shall be taken in loading, transporting and unloading to prevent injury to the pipe or coatings. Pipe shall not be dropped. All pipe shall be examined before laying and no piece shall be installed which is found to be defective. Any damage to the pipe coatings shall be repaired as directed by the Engineer.

All pipe shall be subjected to a careful inspection prior to being installed. If the pipe fails to meet the specified requirements, it shall be removed and replaced with a satisfactory replacement at no additional expense to the Department.

The carrier pipe shall be installed within the casing using spacers as specified. Each joint shall be thoroughly checked prior to being inserted into the casing.

After the casing pipe has been completely installed, thoroughly clean the interior of the casing pipe and remove all excess material leaving a smooth interior throughout.

Dewatering through the casing during construction will not be permitted. The Engineer shall approve all dewatering methods before work begins. Install end seals after the carrier pipe has been installed.

CASING SPACERS

When installing the casing spacers, Contractor is to ensure that the spacers are lined up perfectly straight on the carrier pipe. All runners should line up straight.

Contractor is to ensure that the load of the carrier pipe is uniformly applied to all casing spacers on each joint of pipe. Caution should be taken to not set down the carrier pipe with casing spacers attached unless it is on a cut-a-way section of the casing pipe. The weight should be uniformly distributed to all bottom runners at one time. Contractor could also lay pipe with casing spacers installed onto sand bags or similar material to bear the weight of the carrier pipe.

Spacing between casing spacers shall be a maximum of 8-ft. Spacing between casing spacers and the joints of the casing pipe shall be 2-ft. See manufacturer's recommendations for more information.

Contractor shall restrict or minimize rotation or rifling of the carrier pipe within the casing unless the spacers are designed with equal length runners and specifically intended to allow for rotation. See manufacturer's recommendations for more information.

Method of Measurement: This work will be measured for payment by the actual number of linear feet of ductile iron pipe, in the sizes indicated, complete as shown, specified and directed. The length of pipe to be measured shall be the length of the line after the pipes have been installed, measured or computed along the center line of the pipe from the center line of the main line valves or face of the terminal pipe or fitting, as shown on the Contract Drawings.

Gravel fill from the bottom of the trench to the level 24-inches above the top of the pipe will not be measured for payment, but will be included in the cost of the pipe.

Basis of Payment: This work will be paid for at the contract unit price per linear foot for "Ductile Iron Pipe (Water Main)", of the appropriate size, complete and in place. The price shall also include the cost of digging test pits; transporting the materials; clearing, trenching; disposing of excavated materials, removing and disposing of the present water pipes and any appurtenances as needed; furnishing and installing the pipelines complete as shown on plans or as directed, with restraint where required, including fittings, pressure reducing valves, vaults, bends, restraint, filter fabric, bank gravel, sand, blow off assemblies, gate/butterfly valves, air valves, sterilization fittings, tapping sleeves, tapping gate valves, casing sleeve with end seals, casing spacers, gate valve boxes, tees, thrust blocks, anchors, utility identification tape and fire hydrant

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assemblies; refilling trenches; furnishing the additional materials; temporary and permanent resurfacing; grading; sheeting; bracing; pumping and all incidental work, except as otherwise herein provided for. No claim will be allowed because the number of pipes and joints may be greater than estimated by the Contractor. The price shall also include all material, transportation, labor, including labor required to assist the Department during the testing, and equipment necessary to construct the pipelines in accord with the Contract Drawings, the Specifications and the requirements of the Engineer there under.

The cost of all excavation, disposing of excavated material, except that which is suitable for refilling, and furnishing other materials for refilling, unless otherwise specified, will be considered as having been included in the lump sum price bid.

No direct payment will be made for any work done or materials used in making the pipeline tight.

<u>Pay Item</u>	<u>Pay Unit</u>
Furnishing and Installing 12” Ductile Iron Pipe, Valves & Misc. Fittings	L.S.

PERMITS AND REQUIRED PROVISIONS

The following Permits and Required Provisions follow this page and are hereby made part of this Contract.

PERMITS AND APPROVALS

Permit	Permit No.	Approval Date
Bristol Conversation Commission – Wetland Permit	2018	February 12, 2024
Bristol Flood & Erosion Commission – Flood Plain Application	23-466F-302	February 12, 2024
CT DOT FM MOU	N/A	April 12, 2023
USACOE – Self Verification	N/A	Pending



City of Bristol

CERTIFIED MAIL

February 12, 2024

City of Bristol
Public Works Department
111 North Main St.
Bristol, CT 06010

RE: Application #2018 – Wetlands application for the replacement of Bridge No. 04487 on East Street and over the Pequabuck River; City of Bristol right-of-way; City of Bristol, Public Works Department, applicant.

Dear Applicant:

The Inland Wetlands Commission, at its meeting of February 5, 2024, voted to grant final approval to the subject application with the following stipulations:

1-21 Attached;

Please send two copies of the final plans, after which one stamped approved plan will be returned to you.

This approval does not relieve you from obtaining applicable local, state or federal permits associated with the proposed activities on the site.

Should you have any further questions or comments, please contact me at 860-584-6125 or the Land Use Office at 860-584-6225.

Sincerely,

A handwritten signature in black ink, appearing to read "Nancy Levesque".

Nancy Levesque, P.E.
City Engineer

NL/nk

c: Zachary Norton, IWEO, Environmental Tech (via e-mail)
Nancy Levesque, P.E., City Engineer, Public Works Dept. (via e-mail)
Paul Brand GM2 Associates, Inc.

THE PERMIT IS ISSUED SUBJECT TO THE FOLLOWING CONDITIONS AND/OR MODIFICATIONS:

1. The Inland Wetlands Enforcement Officer (IWE0) shall be notified at least three days prior to the initiation of any regulated activity under this permit (584-6116) and shall be regularly informed as to the progress of all activities involved in this proposal.
2. The duration of any permit shall be five (5) years unless otherwise approved by the Commission.
3. All work and all regulated activities conducted pursuant to this authorization shall be consistent with the terms and conditions of this permit. Any structures, excavation, fill, obstructions, encroachments or regulated activities not specifically identified and authorized herein shall constitute a violation of this permit and may result in its modification, suspension or revocation. Upon initiation of the activities authorized herein, the permittee thereby accepts and agrees to comply with the terms and conditions of this permit.
4. This authorization is not transferable without the written consent of the Commission.
5. In evaluating this application, the Commission has relied on information provided by the applicant and, if such information subsequently proves to be false, deceptive, incomplete and/or inaccurate, this permit shall be modified, suspended or revoked.
6. This permittee shall employ best management practices, consistent with the terms and conditions of this permit and current state and local guidelines, to control storm water discharges and to prevent erosion and sedimentation and to otherwise prevent pollution of wetlands or watercourses. For information and technical assistance, contact the Land Use Office, 111 North Main St., Bristol, (860) 584-6225.
7. The permittee shall immediately inform the Commission/Engineering Division of any problems involving wetlands or watercourses which have developed in the course of, or which are caused by, the authorized work.
8. No equipment or material including without limitation, fill, construction materials or debris shall be deposited, placed or stored in any wetlands, watercourse or flood plain on or off site unless specifically authorized by this permit or, if applicable, by a Flood Plain Permit.
9. This permit is subject to and does not derogate any present or future property rights or other rights or powers of the City of Bristol and conveys no property rights in real estate of material nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the property or activity affected hereby.
10. If the activity authorized by this permit also involves activity or a project which requires zoning or subdivision approval, special permit, variance or special exception, no work pursuant to this permit may begin until such approval is obtained.
11. Timely implementation and maintenance of sediment and erosion control measures as outlined in the "Connecticut Guidelines for Soil, Erosion & Sediment Control", dated May 2002 and as revised, shall be a condition of this permit.
12. All siltation and sedimentation control measures shall be removed once all upgradient site construction has been completed and a suitable vegetative ground cover has been established on all previously disturbed non-surfaced areas.
13. All excess fill material shall be disposed of off-site. Off-site disposal areas within an area regulated by the Inland Wetlands Commission shall require approval from the Commission.
14. If required by the Commission, signs delineating the City of Bristol Inland Wetlands Conservation Easement shall be located a minimum of thirty (30) feet apart or at a change of direction unless otherwise approved by the Engineering Division. A minimum of three (3) signs per lot shall be provided. Signs shall be installed on 4" X 4" posts, set below frost, and shall read "City of Bristol Conservation Easement". Signs shall be installed prior to any activity and maintained in perpetuity.
15. Conservation easement language shall be submitted for City's review prior to recording. Conservation easement shall include provisions for restrictions of fertilizers, pesticides, and herbicide use in and adjacent to conservation easement, unless related to an approved invasive species management plan.
16. The following construction sequence shall be implemented unless otherwise approved by the Commission consist of the following:
 - a. Contact IWE0 (584-6116)
 - b. Clearly designate limits of construction.
 - c. Install conservation easement signs (if required)
 - d. Install erosion control measures
 - e. Install storm drainage (At a minimum, all retention and detention areas must be excavated to rough grade prior to building construction or placement of impervious surface within the area to be served by those facilities. To prevent reduction in storage volume and percolation rates, all accumulated sediments must be removed from the storage area prior to final grading and stabilization.)
 - f. Construct regulated activity in accordance with approved plan
 - g. Once stabilized, remove erosion control measures

17. Where mitigation is proposed, areas shall be planted prior to any of the following events (whichever comes first); issuance of the first certificate of occupancy, use of the infrastructure for its intended use, or transfer of the responsibility for operation and maintenance to the City or other responsible entity.
18. Stabilization shall be initiated as soon as practicable in portions of site where construction activities have temporarily or permanently ceased, but in no more than 7 days after the construction activity in that portion of the site has temporarily or permanently ceased.
19. For those systems which will be operated or maintained by an entity which will require an easement or deed restriction in order to provide that entity with the authority necessary to operate or maintain the system, such easement or deed restriction, together with any final operation or maintenance documents, shall be submitted to the City for approval. Deed restrictions, easements and other operation and maintenance documents which require recordation must be so recorded prior to lot or unit sales within the project served by the system, or upon completion of construction of the system, whichever occurs first. For those systems which are proposed to be maintained by the City, final operation and maintenance documents shall be submitted when the maintenance operation is accepted by the City. Failure to submit the appropriate documents will result in the Permittee remaining liable for carrying out maintenance and operation of the permitted system.
20. Each phase of independent portion of the permitted system must be completed in accordance with the permitted plans and permit conditions prior to the initiation of the permitted use of site infrastructure located in the area served by that portion or phase of the system. Each phase of independent portion of the system must be completed in accordance with the permitted plan and permit conditions prior to transfer of responsibility for operation and maintenance of that phase or portion of the system to the City or responsible entity.
21. The roof leaders from the proposed construction shall be connected to a water quality/groundwater recharge system, designed for site-specific groundwater and soil conditions, in accordance with CT Stormwater Quality Manual, as approved by the Engineering Department.



City of Bristol

CERTIFIED MAIL

February 12, 2024

City of Bristol
Public Works Department
111 North Main St.
Bristol, CT 06010

RE: Application #23-466F-302 – Floodplain application for the replacement of Bridge No. 04487 on East Street and over the Pequabuck River; City of Bristol right-of-way; City of Bristol, Public Works Department applicant.

Dear Applicant:

The Inland Wetlands Commission, at its meeting of February 5, 2024, voted to grant final approval to the subject application with the following stipulations:

1-21 Attached;

Please send two copies of the final plans, after which one stamped approved plan will be returned to you.

This approval does not relieve you from obtaining applicable local, state or federal permits associated with the proposed activities on the site.

Should you have any further questions or comments, please contact me at 860-584-6125 or the Land Use Office at 860-584-6225.

Sincerely,

A handwritten signature in black ink, appearing to read "Nancy Levesque".

Nancy Levesque, P.E.
City Engineer

NL/nk

c: Zachary Norton, IWEO, Environmental Tech (via e-mail)
Nancy Levesque, P.E., City Engineer, Public Works Dept. (via e-mail)
Paul Brand GM2 Associates, Inc.

THE PERMIT IS ISSUED SUBJECT TO THE FOLLOWING CONDITIONS AND/OR MODIFICATIONS:

1. The Inland Wetlands Enforcement Officer (IWEEO) shall be notified at least three days prior to the initiation of any regulated activity under this permit (584-6116) and shall be regularly informed as to the progress of all activities involved in this proposal.
2. The duration of any permit shall be five (5) years unless otherwise approved by the Commission.
3. All work and all regulated activities conducted pursuant to this authorization shall be consistent with the terms and conditions of this permit. Any structures, excavation, fill, obstructions, encroachments or regulated activities not specifically identified and authorized herein shall constitute a violation of this permit and may result in its modification, suspension or revocation. Upon initiation of the activities authorized herein, the permittee thereby accepts and agrees to comply with the terms and conditions of this permit.
4. This authorization is not transferable without the written consent of the Commission.
5. In evaluating this application, the Commission has relied on information provided by the applicant and, if such information subsequently proves to be false, deceptive, incomplete and/or inaccurate, this permit shall be modified, suspended or revoked.
6. This permittee shall employ best management practices, consistent with the terms and conditions of this permit and current state and local guidelines, to control storm water discharges and to prevent erosion and sedimentation and to otherwise prevent pollution of wetlands or watercourses. For information and technical assistance, contact the Land Use Office, 111 North Main St., Bristol, (860) 584-6225.
7. The permittee shall immediately inform the Commission/Engineering Division of any problems involving wetlands or watercourses which have developed in the course of, or which are caused by, the authorized work.
8. No equipment or material including without limitation, fill, construction materials or debris shall be deposited, placed or stored in any wetlands, watercourse or flood plain on or off site unless specifically authorized by this permit or, if applicable, by a Flood Plain Permit.
9. This permit is subject to and does not derogate any present or future property rights or other rights or powers of the City of Bristol and conveys no property rights in real estate of material nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the property or activity affected hereby.
10. If the activity authorized by this permit also involves activity of a project which requires zoning or subdivision approval, special permit, variance or special exception, no work pursuant to this permit may begin until such approval is obtained.
11. Timely implementation and maintenance of sediment and erosion control measures as outlined in the "Connecticut Guidelines for Soil, Erosion & Sediment Control", dated May 2002 and as revised, shall be a condition of this permit.
12. All siltation and sedimentation control measures shall be removed once all upgradient site construction has been completed and a suitable vegetative ground cover has been established on all previously disturbed non-surfaced areas.
13. All excess fill material shall be disposed of off-site. Off-site disposal areas within an area regulated by the Inland Wetlands Commission shall require approval from the Commission.
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 - c. Install conservation easement signs (if required)
 - d. Install erosion control measures
 - e. Install storm drainage (At a minimum, all retention and detention areas must be excavated to rough grade prior to building construction or placement of impervious surface within the area to be served by those facilities. To prevent reduction in storage volume and percolation rates, all accumulated sediments must be removed from the storage area prior to final grading and stabilization.)
 - f. Construct regulated activity in accordance with approved plan
 - g. Once stabilized, remove erosion control measures

17. Where mitigation is proposed, areas shall be planted prior to any of the following events (whichever comes first); issuance of the first certificate of occupancy, use of the infrastructure for its intended use, or transfer of the responsibility for operation and maintenance to the City or other responsible entity.
18. Stabilization shall be initiated as soon as practicable in portions of site where construction activities have temporarily or permanently ceased, but in no more than 7 days after the construction activity in that portion of the site has temporarily or permanently ceased.
19. For those systems which will be operated or maintained by an entity which will require an easement or deed restriction in order to provide that entity with the authority necessary to operate or maintain the system, such easement or deed restriction, together with any final operation or maintenance documents, shall be submitted to the City for approval. Deed restrictions, easements and other operation and maintenance documents which require recordation must be so recorded prior to lot or unit sales within the project served by the system, or upon completion of construction of the system, whichever occurs first. For those systems which are proposed to be maintained by the City, final operation and maintenance documents shall be submitted when the maintenance operation is accepted by the City. Failure to submit the appropriate documents will result in the Permittee remaining liable for carrying out maintenance and operation of the permitted system.
20. Each phase of independent portion of the permitted system must be completed in accordance with the permitted plans and permit conditions prior to the initiation of the permitted use of site infrastructure located in the area served by that portion or phase of the system. Each phase of independent portion of the system must be completed in accordance with the permitted plan and permit conditions prior to transfer of responsibility for operation and maintenance of that phase or portion of the system to the City or responsible entity.
21. The roof leaders from the proposed construction shall be connected to a water quality/groundwater recharge system, designed for site-specific groundwater and soil conditions, in accordance with CT Stormwater Quality Manual, as approved by the Engineering Department.



STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION



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

April 12, 2023

The Honorable Jeffrey Caggiano
Mayor
City of Bristol
111 North Main Street
Bristol, Connecticut 06010

Dear Mayor Caggiano:

Subject: Flood Management Certification (FMC)
State Project No. 0017-0192
Rehabilitation of Bridge No. 04487, East Street over Pequabuck River
City of Bristol

In accordance with the Memorandum of Understanding (MOU) between the Connecticut Department of Transportation (Department) and the Connecticut Department of Energy and Environmental Protection (DEEP) regarding flood management certifications for municipal projects, the Department has completed the review of the flood management certification prepared and submitted for the city of Bristol for the subject project. The certification states that the proposed activity is consistent with all applicable standards and criteria established in Section 25-68d(b) of the Connecticut General Statutes and Sections 25-68h-1 through 25-68h-3, inclusive, of the Regulations of Connecticut State Agencies.

The proposed project involves the rehabilitation of Bridge No. 04487, East Street over Pequabuck River, in Bristol, Connecticut, as shown on the Environmental Permit Plans dated February 3, 2023, and as documented in the Final Hydraulic Report dated February 2, 2023, and the Final Floodway Report dated February 2, 2023. The project is located within the 100-year Flood Zone AE of the Pequabuck River.

The certification is complete and approved, subject to the following standard conditions:

Standard Conditions:

1. Time of Year Restriction on In-water Construction
 - a. Between September 30th and May 31st, the municipality shall not place fill, excavate material, or conduct any other construction activity in any watercourse unless such activity is confined by a cofferdam or other device which isolates such activity from the watercourse, unless the DEEP Inland Fisheries Division has given written authorization otherwise.

- b. The municipality shall not place fill, excavate material, or conduct any other activity in any watercourse stocked with fish by the Commissioner or any other person, or in any tributary to such watercourse, from 12:01 a.m. on the Monday preceding the third Saturday in April through 12 midnight on the Sunday preceding the fourth Saturday in April.
- c. The municipality shall not place fill, excavate material, or conduct any other construction activity in or adjacent to any watercourse, which activity may adversely affect anadromous fish, during the time period when anadromous fish are known or reasonably believed to be migrating in the watercourse.

2. Pollution Prevention/Best Management Practices

The municipality shall not cause or allow the authorized activity, including any construction associated therewith, to result in pollution or other environmental damage and shall employ best management practices to prevent such damage. The municipality shall, in addition to employing any other best management practices necessary to prevent such damage, do the following:

a. Controlling Erosion

The municipality shall install and maintain in optimal condition erosion and sedimentation controls to prevent erosion and discharge of material into any waters of the state, including wetlands, as a result of the authorized activity or any construction associated therewith. Such controls shall be installed and maintained in conformance with the *Connecticut Guidelines for Soil Erosion and Sediment Control*, as revised, published by the Connecticut Council on Soil and Water Conservation pursuant to Section 22a-328 of the Connecticut General Statutes.

b. Proper Disposal of Material

All material and solid waste generated during any construction associated with such activity shall be disposed of in accordance with applicable federal, state, and local law.

3. Storage of equipment/material within the floodplain should be avoided; but, if absolutely necessary, the municipality will require the contractor to remove equipment and materials from the 100-year floodplain during periods when flood warnings have been issued or are anticipated by a responsible federal, state or local agency. It shall be the contractor's responsibility to be knowledgeable of such warnings when flooding is anticipated.
4. Work shall not be conducted in or adjacent to watercourses and reservoirs used as public drinking water supply sources without coordination with the water supply utility and the Department of Public Health.
5. All temporary structures, cofferdams, and fill shall not impede the movement of flood flows and shall be removed at the completion of their use. The design of such temporary structures, cofferdams and fill shall be based on the DOT Drainage Manual, where applicable. Sheet piling that is cut 1 foot below existing grade shall be considered removed.

The Honorable Jeffrey Caggiano

-3-

April 12, 2023

6. All fill shall be clean material, free of stumps, rubbish, hazardous, and toxic material.
7. Once work is initiated, it shall proceed rapidly and steadily until completed and stabilized in order to minimize use of temporary structures and to minimize soil erosion.

Please be advised of the following project specific information:

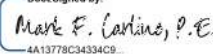
1. Pursuant to Standard Condition 1.c, coordination with DEEP Inland Fisheries Division concluded that there were no anadromous fish of concern within the project area.
2. The Contractor must contact DEEP Fisheries Biologist Matt Goclowski of DEEP Fisheries at matthew.goclowski@ct.gov ten days before the installation of the boulder cluster.

A copy of the completed certification forms is attached for your records. No revisions or alterations to the approved plans are allowed without first obtaining written approval from the Department for such alterations.

This letter and certification forms must be attached to any subsequent permit applications for the municipal project that are submitted to the DEEP or the U.S. Army Corps of Engineers.

If there are any questions, please contact Mr. Michael Hogan, Transportation Principal Engineer for the Hydraulics and Drainage Section, at 860-594-3241 or Michael.Hogan@ct.gov.

Very truly yours,

DocuSigned by:

4A13778C34334C9

Mark F. Carlino, P. E.
Engineering Administrator
Bureau of Engineering and Construction

The Honorable Jeffrey Caggiano

-4-

April 12, 2023

Enclosures

cc: Mr. Jeff Caiola, DEEP

PM/kar

bcc: Scott A. Hill

James A. Fallon

Mark F. Carlino

Bartholomew P. Sweeney

Michael E. Hogan - Chong L. Chow - Pichay Mar-Mascoli

Marc P. Byrnes – James Barrows

Kevin F. Carifa - Andrew H. Davis - Amanda M. Saul

Jason M. Coite - David W. Harms

 Digitally signed by Bartholomew P. Sweeney
DN: cn=Bartholomew P. Sweeney, o=St. Joseph's Hospital & HealthCare, ou=St. Joseph's Hospital & HealthCare, email=bsweeney@sjhh.com

 Digitally signed by Chong L. Chow
DN: cn=Chong L. Chow, o=St. Joseph's Hospital & HealthCare, ou=St. Joseph's Hospital & HealthCare, email=chow@sjhh.com

 Digitally signed by Michael E. Hogan
DN: cn=Michael E. Hogan, o=St. Joseph's Hospital & HealthCare, ou=St. Joseph's Hospital & HealthCare, email=mehogan@sjhh.com

 Digitally signed by Pichay Mar-Mascoli
DN: cn=Pichay Mar-Mascoli, o=St. Joseph's Hospital & HealthCare, ou=St. Joseph's Hospital & HealthCare, email=mascoli@sjhh.com

**Statewide Flood Management Certification for
Federally and State Funded Municipal Projects**

Attachment A: DOT

A-1: Engineering Certification


Name of Subject Facility and DOT Project Number:

Bridge No. 04487, East Street over Pequabuck River, Bristol
State Project No. 0017-0192

Name of floodplain and watercourse:

Zone AE and Floodway
Pequabuck River

I hereby certify, in reliance on the Municipal Official Certification, the Town Engineer / Consultant-Professional Certification, the DOT Hydraulics and Drainage Section and the DOT Environmental Planning reviews, that the above referenced project qualifies for the DEP Commissioner's approval pursuant to Section 25-68d of the General Statutes, and that the proposed activity described in this application is consistent with all applicable standards and criteria established in Sections 25-68d(b) of the General Statutes and Sections 25-68h-1 through 25-68h-3, inclusive, of the Regulations of Connecticut State Agencies.

Signature:  _____

4/11/2023

Date

Print/Type: _____
Mark F. Carlino
Transportation Engineering Administrator
Bureau of Engineering and Construction


Statewide Flood Management Certification for Federally and State Funded Municipal Projects

Attachment A: DOT

DOT Project No. 0017-0192

A-2: Hydraulics and Drainage Section Review

Based on my review and reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the proposed activity described in this application is consistent with all applicable standards and criteria established in Sections 25-68d(b) of the General Statutes and Sections 25-68h-1 through 25-68h-3, inclusive, of the Regulations of Connecticut State Agencies.


Signature:

Digitally signed by Michael E. Hogan, P.E.
Date: 2023.03.28 08:25:22-04'00'

Date

Print/Type: Michael E. Hogan
 Transportation Principal Engineer
 Hydraulics and Drainage Section

A-3: Environmental Planning Review

Based on my review and reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the proposed activity described in this application is consistent with all applicable standards found in the 2004 Connecticut Stormwater Manual, 2002 Erosion and Sedimentation Control Guidelines (as amended) and that there has been proper coordination with the Inland Fisheries Division and the Natural Diversity Database.

Signature:

Digitally signed by Andrew H Davis
DN: C=US, E=andrew.h.davis@ct.gov,
O=Connecticut Department of Transportation,
OU=Natural Resources Planning, CN=Andrew H Davis
Date: 2023.03.23 15:53:03-04'00'

Date

Print/Type: Andrew H. Davis
 Transportation Supervising Planner
 Office of Environmental Planning

**Statewide Flood Management Certification for
Federally and State Funded Municipal Projects**

Attachment B: Municipality

B-1: Municipal Official Certification

Name of Applicant / Municipality: City of Bristol

DOT Project No.: 0017-0192

Description of Proposed Project: Replacement of Bridge No. 04487, East Street over Pequabuck River.
Work includes full abutment and pier replacement and construction of new two-span structure with adjacent prestressed deck units.

1. The recipient of federal and/or state funding will be:

Name: City of Bristol

Mailing Address: 111 North Main Street

City/Town: Bristol

State: CT

Zip Code: 06010

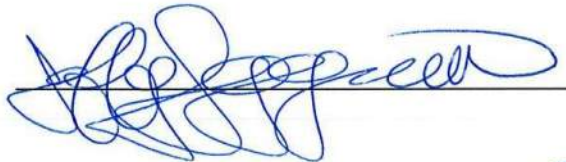
Phone: 860-584-6100 ext.

Fax:

Based on my review and reasonable investigation, including my inquiry of those individuals responsible for preparing the information, the proposed activity described in this application is consistent with all applicable standards and criteria established in Sections 25-68d(b) of the General Statutes and Sections 25-68h-1 through 25-68h-3, inclusive, of the Regulations of Connecticut State Agencies.

I understand that a false statement made in the submitted information may, pursuant to Section 22a-6 of the General Statutes, be punishable as a criminal offense under Section 53a-157b of the General Statutes, and may also be punishable under Section 22a-438 of the General Statutes.

Signature:



2/10/2023
Date

Print/Type:

Mayor, City of Bristol
Chief Elected Official
First Selectman

**Statewide Flood Management Certification for
Federally and State Funded Municipal Projects**

Attachment B: Municipality

B-2: Town Engineer / Consultant - Professional Certification

DOT Project No.: 0017-0192

Description of Proposed Project: Replacement of Bridge No. 04487, East Street over Pequabuck River. Work includes full abutment and pier replacement and construction of new two-span structure with adjacent prestressed deck units.

Plan Dated and Revised Through: 02/03/2023

Hydrologic and Hydraulic Study Dated: Hydrology Report: 03/10/2021
Hydraulic Report: 02/02/2023
Floodway Report: 02/02/2023

I hereby certify that the prepared information and the proposed activity described in this application is consistent with all applicable standards and criteria established in Sections 25-68d(b) of the General Statutes and Sections 25-68h-1 through 25-68h-3, inclusive, of the Regulations of Connecticut State Agencies.

I understand that a false statement made in the submitted information may, pursuant to Section 22a-6 of the General Statutes, be punishable as a criminal offense under Section 53a-157b of the General Statutes, and may also be punishable under Section 22a-438 of the General Statutes.

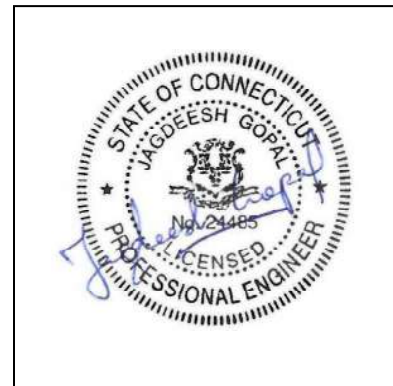
Signature: Jagdeesh Gopal

2/13/2023

Date

Print/Type: JAGDEESH GOPAL
Professional Engineer

P.E. Number: 24485



Affix P.E. Stamp Here

**JULY 2023 SUPPLEMENTAL SPECIFICATIONS TO STANDARD
SPECIFICATIONS FOR ROADS, BRIDGES, FACILITIES AND
INCIDENTAL CONSTRUCTION FORM 818**

State of Connecticut
Department of Transportation

SUPPLEMENTAL SPECIFICATIONS
TO
STANDARD SPECIFICATIONS
FOR ROADS, BRIDGES, FACILITIES
AND INCIDENTAL CONSTRUCTION
FORM 818
2020

Updated to
JULY 2023

CTDOT FORM 818 - SUPPLEMENTAL SPECIFICATIONS - ERRATA
July 2020, January 2021, July 2021, January 2022, July 2022, January 2023 and July 2023

<u>Section or Article</u>	<u>Please make the following Corrections:</u>	<u>Rev. Date</u>
Division I Part 1 - GENERAL REQUIREMENTS AND COVENANTS		
1.01.02	<ol style="list-style-type: none"> after the abbreviation for ADSC add “AFBMA—Anti-Friction Bearing Manufacturer’s Association” after the abbreviation for AGC add “AGMA—American Gear Manufacturer’s Association” after the abbreviation for AMRL add “AMS—Aerospace Material Specification” after the abbreviation for AWWA add “BGFMA—Bridge Grid Flooring Manufacturer’s Association” 	July20
1.01.02	<ol style="list-style-type: none"> after the abbreviation for AMCA add “AMPP—The Association for Materials Protection and Performance [formerly NACE and SSPC]” after the abbreviation for EPA add “ETL—Edison Testing Laboratories” after the abbreviation for IAS add “IBC—International Building Code” revise the abbreviation for NACE to “NACE—National Association of Corrosion Engineers see AMPP” after the abbreviation for NTMA add “NTPEP—National Transportation Product Evaluation Program” after the abbreviation for RCSA add “RCSC—Research Council on Structural Connections” revise the abbreviation for SSPC to “SSPC—The Society for Protective Coatings (formerly The Steel Structures Painting Council) see AMPP” but keep the NOTE 	Jan21
1.01.02	<ol style="list-style-type: none"> after the abbreviation for ACI add “ACMA—American Composites Manufacturers’ Association” after the abbreviation for NOAA add “NPCA—National Precast Concrete Association” after the abbreviation for TIA/EIA add “TMS—the Masonry Society” change the entry for USACOE to “USACE—United States Army Corps of Engineers” 	July21
1.01.02	<ol style="list-style-type: none"> after the abbreviation for AASHTO add “AASHTO re:source—A technical service program of AASHTO” revise the abbreviation for AMRL to “AMRL—Materials Reference Library see AASHTO re:source” 	Jan22
1.01.02	<ol style="list-style-type: none"> revise the entry for ITE to “ITE—Institute of Transportation Engineers” after the abbreviation for OEO add “OIS—Office of Information Systems” after the abbreviation for OSHA add “OSTA—Office of State Traffic Administration” 	July22
1.01.02	<ol style="list-style-type: none"> after the abbreviation for AWWA add “BAA—Buy America Act” and “BABA—Build America, Buy America” after the abbreviation for IMSA add “IPC—Institute of Printed Circuits” 	Jan23
1.01.02	<ol style="list-style-type: none"> Revise the abbreviation for NTPEP to “NTPEP—National Transportation Product Evaluation Program (name changed to AASHTO Product Evaluation and Audit Solutions)” after the abbreviation for APA add “APWA—American Public Works Association” 	July23
1.01.03	<ol style="list-style-type: none"> after the abbreviation for pfmd. add “PQR—procedure qualification record” after the abbreviation for surf. add “TBD—to be determined” after the abbreviation for W add “WPS—weld procedure specification” 	July20
1.01.03	after the abbreviation for CMS add “ CMU—concrete masonry unit ”	July21
1.01.03	<ol style="list-style-type: none"> after the abbreviation for CPS add “CTR—Certified Test Report” after the abbreviation for dist. add “DPDM—Digital Project Development Manual” after the abbreviation for exc add “fc—foot-candle” after the abbreviation for I.P.S. add “ITS—Intelligent Transportation System” after the abbreviation for l.s. add “MAA—mast arm assembly(ies)” after the abbreviation for MBR add “MC—Materials Certificate” and “MESU—Material Evaluation and Specification Unit” 	Jan23
1.07.11	change the first sentence as follows “Whenever, in the judgment of the Engineer...”	Jan22
1.08.05	change the second sentence as follows “The Engineer may demand...on the Project who is, in the judgment of the Engineer, guilty...”	Jan22
1.08.10	change the first sentence of the last paragraph to “...other methods or combinations thereof as in the Commissioner’s judgment shall be required...”	Jan22
Division I Part 2 - GENERAL REQUIREMENTS AND COVENANTS FOR FACILITIES CONSTRUCTION		
1.20-1.01.02	<ol style="list-style-type: none"> after the abbreviation for ADSC add “AFBMA—Anti-Friction Bearing Manufacturer’s Association” after the abbreviation for AGC add “AGMA—American Gear Manufacturer’s Association” after the abbreviation for AMRL add “AMS—Aerospace Material Specification” after the abbreviation for AWWA add “BGFMA—Bridge Grid Flooring Manufacturer’s Association” 	July20
1.20-1.01.02	<ol style="list-style-type: none"> after the abbreviation for AMCA add “AMPP—The Association for Materials Protection and Performance [formerly NACE and SSPC]” after the abbreviation for EPA add “ETL—Edison Testing Laboratories” 	Jan21

CTDOT FORM 818 - SUPPLEMENTAL SPECIFICATIONS - ERRATA
July 2020, January 2021, July 2021, January 2022, July 2022, January 2023 and July 2023

<u>Section or Article</u>	<u>Please make the following Corrections:</u>	<u>Rev. Date</u>
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1.20-1.01.02	<ol style="list-style-type: none"> 1. after the abbreviation for ACI add “ACMA—American Composites Manufacturers’ Association” 2. after the abbreviation for NOAA add “NPCA—National Precast Concrete Association” 3. after the abbreviation for TIA/EIA add “TMS—the Masonry Society” 4. change the entry for USACOE to “USACE—United States Army Corps of Engineers” 	July21
1.20-1.01.02	<ol style="list-style-type: none"> 1. after the abbreviation for AASHTO add “AASHTO re:source—A technical service program of AASHTO” 2. revise the abbreviation for AMRL to “AMRL—Materials Reference Library see AASHTO re:source” 	Jan22
1.20-1.01.02	<ol style="list-style-type: none"> 1. after the abbreviation for DOD add “DPDM—Digital Project Development Manual” 2. revise the entry for ITE to “ITE—Institute of Transportation Engineers” 3. after the abbreviation for OEO add “OIS—Office of Information Systems” 4. after the abbreviation for OSHA add “OSTA—Office of State Traffic Administration” 	July22
1.20-1.01.02	after the abbreviation for AWWA add “ BAA—Buy America Act ” and “ BABA—Build America, Buy America ”	Jan23
1.20-1.01.02	<ol style="list-style-type: none"> 1. Revise the abbreviation for NTPEP to “NTPEP—National Transportation Product Evaluation Program (name changed to AASHTO Product Evaluation and Audit Solutions)” 2. after the abbreviation for APA add “APWA—American Public Works Association” 	July23
1.20-1.01.03	<ol style="list-style-type: none"> 1. after the abbreviation for pfmd. add “PQR—procedure qualification record” 2. after the abbreviation for surf. add “TBD—to be determined” 3. after the abbreviation for W add “WPS—weld procedure specification” 	July20
1.20-1.01.03	after the abbreviation for CMS add “ CMU—concrete masonry unit ”	July21
1.20-1.01.03	<ol style="list-style-type: none"> 1. after the abbreviation for CPS add “CTR—Certified Test Report” 2. after the abbreviation for dist. add “DPDM—Digital Project Development Manual” 3. after the abbreviation for exc add “fc—foot-candle” 4. after the abbreviation for l.s. add “MAA—mast arm assembly(ies)” 5. after the abbreviation for MBR add “MC—Materials Certificate” 6. after the abbreviation for mbf add “MESU—Material Evaluation and Specification Unit” 	Jan23
1.20-1.02.04	<ol style="list-style-type: none"> 1. in the first line of the list, change “2015” to “2021” 2. in the second line of the list, change “2015” to “2021” 3. in the third line of the list, change “2015” to “2021” 4. in the fourth line of the list, change “2015” to “2021” 5. in the fifth line of the list, change “2015” to “2021” 6. in the sixth line of the list, change “2017” to “2020” 7. in the seventh line of the list, change “2007” to “2017” 8. in the tenth line of the list, change “2015” to “2021” 9. in the eleventh line of the list, change “2015” to “2021” 10. in the fourteenth line of the list, change “2015” to “2021” 	July23
1.20-1.07.11	change the first sentence to “Whenever, in the judgment of the Engineer, any portion of the Project...”	Jan22
1.20-1.08.03	in 1.20-1.08.03-4C, change the first sentence to “...in a manner that would, in the Engineer’s judgment ,...”	Jan22
1.20-1.08.05	change the second sentence as follows “The Engineer may demand...on the Project who is, in the judgment of the Engineer, guilty...”	Jan22
1.20-1.08.10	change the first sentence of the last paragraph to “...other methods or combinations thereof as in the Commissioner’s judgment shall be required...”	Jan22

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<u>Section or Article</u>	<u>Please make the following Corrections:</u>	<u>Rev. Date</u>
Division II CONSTRUCTION DETAILS		
2.02.03	<i>in the third paragraph of subarticle 5. Placement of Embankment Material replace "... slopes steeper than 1:3 ..." with "... slopes 1 vertical to 3 horizontal or steeper ..."</i>	July20
2.02.04	<i>in the fifteenth paragraph, revise the first sentence to "...strip or expose the rock to such an extent that in the Engineer's judgment the necessary..."</i>	Jan22
2.03.04	<i>in the first paragraph, revise the second sentence to "...to such an extent that in the Engineer's judgment the necessary measurements..."</i>	Jan22
2.06.01	<i>change the first sentence of the only paragraph as follows "...necessary for the construction of drainage ditches and paved leak-offs..."</i>	July20
2.06.04	<i>change subarticle 2. Paved Leak-offs and Paved Ditches to "2. Paved Leak-offs"</i>	July20
2.07.03	<i>revise the last sentence of the first paragraph to "This permission may be revoked by the Engineer at any time if in their judgment satisfactory progress..."</i>	Jan22
2.07.04	<i>revise the first sentence of 2.07.04(a) to "If, in the judgment of the Engineer..."</i>	Jan22
5.08.03	<i>revise the first sentence of the second paragraph to "... the Contractor shall submit for the Engineer's approval a laboratory qualification from the manufacturer ..." (delete the word notarized)</i>	July23
6.06.03	<i>revise the last sentence of subarticle 6.06.03-3 to "...mortar has attained a strength sufficient, in the judgment of the Engineer,..."</i>	Jan22
7.01.03	<i>1. in the third to last paragraph of subarticle 7.01.03-18, revise the last sentence to "If at any time, in the judgment of the Engineer,..."</i> <i>2. revise the last sentence of subarticle 7.01.03-25 to "...satisfactorily accomplished by free fall, in the judgment of the Engineer,..."</i>	Jan22
7.05.02	<i>change the end of the second sentence as follows "...requirements of M.03 for Class PCC0223Z."</i>	Jan23
8.13.04	<i>change the only sentence as follows "... be measured for payment along the top arris line of the curb ..."</i>	July20
9.11.02	<i>in the second sentence, change "M.03.07" to "M.03.05"</i>	Jan22
9.22.02	<i>in 9.22.02-2, delete ", HMA S0.375" at the end of the sentence</i>	Jan22
9.70.03	<i>in the first sentence of paragraph 5, insert "the" before "MUTCD"</i>	July20
9.76.03	<i>change the last paragraph to "... in accordance with the ATSSA "Quality Guidelines for Temporary Traffic Control Devices and Features," shall be ..."</i>	July20
9.80.03	<i>in 9.80.03-IV-12, revise the first sentence as follows. "The Contractor shall survey and stake other work such as guiderail, curb and gutter, seeding, regulated areas..."</i>	Jan22
10.00.10	<i>in the first sentence of the second paragraph under 10.00.10-2(b)-1, change "push button" to "pushbutton"</i>	Jan21
10.00.11	<i>Revise the eighth paragraph as follows "...seed and fertilize in accordance with 9.50, or as shown on the plans, all landscape grass areas disturbed..."</i>	Jan22
10.01.02	<i>revise the second paragraph to the following "Topsoil, fertilizer, seed and mulch shall be as specified in M.13, or as shown on the plans."</i>	Jan22
10.02.02	<i>1. in the second line of the list, change "PCC03340" to "PCC04461"</i> <i>2. revise the eighth line in the list to the following "M.13.04 for Seed Mixture, if necessary, or as shown on the plans"</i> <i>3. in the second line of the list, change "PCC04461" to "PCC04460"</i>	Jan21 Jan22 July22
10.02.05	<i>1. in the first sentence, change "PCC03340" to "PCC04461"</i> <i>2. in the first sentence, change "PCC04461" to "PCC04460"</i>	Jan21 July22
10.10.02	<i>1. in the third line of the list, change "PCC03360" to "PCC04461"</i> <i>2. revise the eighth line in the list to the following "Seeding, M.13.04, if necessary, or as shown on the plans"</i> <i>3. in the third line of the list, change "PCC04461" to "PCC04460"</i>	Jan21 Jan22 July22
10.17.05	<i>revise the end of the first paragraph as follows "...grading, topsoil, sodding or seeding, and all utility company charges."</i>	Jan22
11.07	<i>change "push button" to "pushbutton" everywhere it appears</i>	Jan21
11.16.02	<i>in the only sentence, change "M.16.18" to "M.16.17"</i>	July21
11.18.03	<i>revise the fourth sentence of the last paragraph as follows "Topsoil to a minimum depth of 4 inches shall be applied and seeded as shown on the plans."</i>	Jan22
11.30.02	<i>in the first paragraph, insert "the" before "MUTCD"</i>	July20

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<u>Section or Article</u>	<u>Please make the following Corrections:</u>	<u>Rev. Date</u>
11.30.03	change the second paragraph to "... in accordance with the ATSSA "Quality Guidelines for Temporary Traffic Control Devices and Features."	July20
11.31.02	in the first paragraph, insert "the" before "MUTCD"	July20
12.02.03	1. revise the last sentence of the third paragraph to "...make use of the forms necessary, in the judgment of the Engineer..." 2. revise the first sentence of the sixth paragraph to "...has sufficiently set, in the judgment of the Engineer..."	Jan22
12.05.03	revise the second sentence of the second paragraph to "...or otherwise damaged to the extent that it is, in the judgment of the Engineer..."	Jan22
12.06.03	change the second sentence of the second to last paragraph as follows "Fertilizing and seeding shall be in accordance with pertinent provisions of 9.50 or as shown on the plans."	Jan22
12.10.03	in the first paragraph of subarticle 12.10.03-3 Initial Performance , change the second sentence as follows "A Certified Test Report (CTR), in accordance with 1.06.07 or 1.20-1.06.07, must be submitted..."	July21
12.12.05	change the second to last paragraph to "... in accordance with the ATSSA "Quality Guidelines for Temporary Traffic Control Devices and Features," shall be ..."	July20
12.12.05	revise the first sentence of the second paragraph to "Any lines which are no longer effective, in the judgment of the Engineer..."	Jan22
12.14.05	revise the first sentence of the second paragraph to "Any masking tape which is no longer effective, in the judgment of the Engineer..."	Jan22
12.20.03	change the second to last paragraph to "... in accordance with the ATSSA "Quality Guidelines for Temporary Traffic Control Devices and Features," shall be ..."	July20
18.06.02	change the first sentence of Article 18.06.02 as follows "... a Materials Certificate in accordance with 1.06.07 or 1.20-1.06.07 for each..."	July21
Division III MATERIALS SECTION		
M.08.01	change the only sentence in the first paragraph as follows "... metal coupling bands in accordance with 1.06.07 or 1.20-1.06.07."	July21
M.09.02	1. change the last sentence of subarticle M.09.02-2 Treatment of Timber Piles as follows "... Materials Certificate, in accordance with 1.06.07 or 1.20-1.06.07, certifying..."	July21
M.10.02	change the last sentence of subarticle M.10.02-9 Plastic Blockouts as follows "... Materials Certificate for blockouts in conformance with 1.06.07 or 1.20-1.06.07."	July21
M.10.05	in the second paragraph of subarticle M.10.05-2 Metal Posts and Rails , change the first sentence as follows "... Materials Certificate in accordance with 1.06.07 or 1.20-1.06.07 for all..."	July21
M.12.03	in the last sentence, change Slope Paving Concrete to "Class PCC0223Z"	Jan23
M.12.06	change the first sentence of subarticle M.12.06-1 as follows "... color variations as in the judgment of the Engineer..."	Jan22
M.12.07	change the first sentence of subarticle M.12.07-1 as follows "... color variations as, in the judgment of the Engineer..."	Jan22
M.12.08	change the first sentence of subarticle M.12.08-1 as follows "... color variations as in the judgment of the Engineer..."	Jan22
M.12.13	change the only sentence in the second paragraph as follows "... Materials Certificate in accordance with 1.06.07 or 1.20-1.06.07."	July21
M.13.06	change the last sentence in the first paragraph as follows "... Materials Certificate and Certified Test Report in accordance with Section 1.06.07 or 1.20-1.06.07."	July21
M.13.07	change subarticle "14. Miscellaneous" as follows " 11. Miscellaneous "	July21
M.17.01	1. change the last sentence of subarticle M.17.01-3(c) as follows "... for each lot in accordance with the requirements of 1.06.07 or 1.20-1.06.07." 2. change the first sentence of subarticle M.17.01-4(c) as follows "... for each batch in accordance with the requirements of 1.06.07 or 1.20-1.06.07."	July21
M.17.02	1. change the last sentence of the second paragraph as follows "... for each lot in accordance with the requirements of 1.06.07 or 1.20-1.06.07." 2. change the last sentence in the last paragraph as follows "... for each batch in accordance with the requirements of 1.06.07 or 1.20-1.06.07."	July21
M.18.10	change the only sentence of subarticle M.18.10-3(M) Quality Assurance as follows "... Certified Test Report in accordance with 1.06.07 or 1.20-1.06.07 shall be submitted."	July21

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N/A	<ol style="list-style-type: none"> 1. <i>delete</i> “4.09, Micro-Milling of Bituminous Concrete (0” to 3”), s.y.” 2. <i>change</i> “4.09, Standard Milling of Bituminous Concrete (Greater Than 4” up to 8”), s.y.” to “4.09, Coarse Milling of Bituminous Concrete (Greater Than 4” Up To 8”), s.y.” 3. <i>change</i> “4.09, Standard Milling of Bituminous Concrete (Greater Than 8”), s.y.” to “4.09, Coarse Milling of Bituminous Concrete (Greater Than 8”), s.y.” 4. <i>delete</i> “8.03, Paved Ditch, s.y.” 5. <i>delete</i> “8.03, Paved Channel, s.y.” 6. <i>delete</i> “8.18, Protective Compound for Bridges, s.y.” 	July20
N/A	<ol style="list-style-type: none"> 1. <i>add</i> “4.07, Rumble Strips – Automated, l.f.” 2. <i>add</i> “4.07, Rumble Strips – Manual, l.f.” 3. <i>add</i> “4.07, Removal of Rumble Strips, l.f.” 4. <i>delete</i> “10.18, Navigation Light, ea.” 5. <i>change</i> “11.07, Pedestrian Push Button and Sign (Type), ea.” to “11.07, Pedestrian Pushbutton and Sign (Type), ea.” 7. <i>delete</i> “11.12, Magnetic Vehicle Detector (Type), ea.” 	Jan21
N/A	<ol style="list-style-type: none"> 1. <i>delete</i> “7.07, Membrane Waterproofing (Woven Glass Fabric), s.y.” 2. <i>change</i> “9.21, Detectable Warning Strip, ea.” to “9.21, Detectable Warning Surface, s.f.” 	July21
N/A	<ol style="list-style-type: none"> 1. <i>delete</i> “4.01, Concrete for Pavement, c.y.” 2. <i>delete</i> “4.01, Mat Reinforcement for Concrete Pavement, s.y.” 3. <i>delete</i> “4.01, Transverse Expansion Joints, l.f.” 4. <i>delete</i> “4.01, Transverse Contraction Joints, l.f.” 5. <i>delete</i> “4.01, Longitudinal Joint Support, ea.” 6. <i>delete</i> “4.01, (Type and Thickness) Expansion Joint Filler, l.f.” 7. <i>replace</i> “5.14, Prestressed Beams - Pretensioned Type (), l.f.” with “5.14, Prestressed Beam (Type), l.f.” 8. <i>add</i> “5.14, Precast Approach Slab, s.y.” 9. <i>add</i> “5.14, Precast Concrete Walls, c.y.” 10. <i>add</i> “5.14, Precast Substructure Element, c.y.” 11. <i>add</i> “5.14, Precast Concrete Three-Sided Rigid Frame, l.f.” 12. <i>add</i> “6.10, Drilling Holes and Bonding Anchors, ea.” 13. <i>add</i> “6.10, Drilling Holes and Bonding Dowels, ea.” 	Jan22
N/A	<ol style="list-style-type: none"> 1. <i>change</i> “5.14, Precast Substructure Element, c.y.” to “5.14, Precast Substructure Element (Type), c.y.” 2. <i>delete</i> “8.22, Temporary Precast Concrete Barrier Curb, l.f.” 3. <i>delete</i> “8.22, Relocated Temporary Precast Concrete Barrier Curb, l.f.” 4. <i>add</i> “8.22, Temporary Traffic Barrier, l.f.” 5. <i>add</i> “8.22, Temporary Traffic Barrier (Pinned), l.f.” 6. <i>add</i> “8.22, Temporary Traffic Barrier (Bolted), l.f.” 7. <i>add</i> “8.22, Relocated Temporary Traffic Barrier, l.f.” 8. <i>add</i> “8.22, Relocated Temporary Traffic Barrier (Pinned), l.f.” 9. <i>add</i> “8.22, Temporary Traffic Barrier (Bolted), l.f.” 	July22
N/A	<ol style="list-style-type: none"> 1. <i>add</i> “5.05, (Type) Endwall, c.y.” 2. <i>add</i> “7.51, Precast Concrete Outlet for Underdrain, ea.” 	Jan23

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12.07 Sign Face - Extruded Aluminum	
12.08 Sign Face - Sheet Aluminum	
12.09 Painted Pavement Markings	
12.10 Epoxy Resin Pavement Markings.....	July 2021, see Errata
12.11 Removal of Pavement Markings.....	
12.12 Temporary Plastic Pavement Marking Tape	Jan 2022, see Errata
12.14 Preformed Black Line Mask Pavement Marking Tape	Jan 2022, see Errata
12.20 Construction Signs	July 2020, see Errata
 13.00 Utilities.....	
 14.00 Vacant	
15.00 Vacant	
16.00 Vacant	
 18.02 Sand Barrels	
18.03 Impact Attenuation System, Temporary Impact Attenuation System.....	July 2023, Revs & Errata
18.06 Truck-Mounted or Trailer-Mounted Impact Attenuator	July 2021, see Errata

Division III MATERIALS SECTION

Section	Rev. Date, Notes
M.01 Aggregates	
M.02 Granular Fill, Subbase, Granular Base and Surfaces, Stone Base, Pervious Structure Backfill, Free-Draining Material, Crusher-Run Stone.....	
M.03 Portland and Hydraulic Cement Concrete.....	July 2023, Revs & Errata
M.04 Bituminous Concrete Materials.....	July 2023, Revs & Errata
M.05 Processed Aggregate Base and Pavement Surface Treatment.....	Jan 2021
M.06 Metals.....	July 2023
M.07 Paint	July 2021, Revs & Errata

July 2020
January 2021
July 2021
January 2022
July 2022
January 2023
July 2023

Section	Rev. Date, Notes
M.08 Drainage.....	July 2021, see Errata
M.09 Sheet Piling and Piles.....	July 2021, see Errata
M.10 Fence, Railing and Posts.....	July 2021, see Errata
M.11 Masonry Facing, Cement and Dry Rubble, Masonry, Brick, Mortar	
M.12 Bearing Areas, Riprap, Slope Paving & Slope Protection, Waterproofing and Dampproofing, Stone and Granite Slope Curbing, Calcium Chloride for Dust Control, Wood....	Jan 2023, see Errata
M.13 Roadside Development	July 2021, see Errata
M.14 Prefabricated Concrete Members.....	Jan 2022
M.15 Highway Illumination	Jan 2021
M.16 Traffic Control Signals	Jan 2021, Revs & Errata
M.17 Elastomeric Materials	July 2021, see Errata
M.18 Signing	July 2021, see Errata
 List of Standard Pay Items	 Jan 2023, see Errata

**SECTION 1.05
 CONTROL OF THE WORK**

In the list of Articles, add the following:

1.05.19—Field Erector Certification

Replace the first and second paragraphs of Article 1.05.08 with the following:

1.05.08—Schedules and Reports: When the Contract does not include the “Project Coordinator” item, the following shall apply:

Baseline Bar Chart Construction Schedule: Within 20 calendar days after contract award the Contractor shall develop a comprehensive bar chart as a baseline schedule for the project. The bar chart schedule shall be submitted to the Engineer for review and comment and shall be based on the following guidelines:

Replace the General Activities Applicable to all projects list under Subarticle 1.05.08-1 with the following:

Project Constraints

- Winter shutdowns
- Environmental permits/application time of year restrictions
- Milestones
- Third Party approvals
- Long lead time items (procurement and fabrication of major elements)
- Adjacent Projects or work by others

Award

Notice to Proceed

Signing (Construction, temporary, permanent by location)

Mobilization

Permits as required

Field Office

Utility Relocations

Submittals/shop drawings/working drawings/product data

Construction of Waste Stock pile area

Clearing and Grubbing

Removal of Invasives (if in Contract)

Earthwork (Borrow, earth ex, rock ex etc.)

Traffic control items (including illumination and signalization)

Pavement markings

Roadway Construction (Breakdown into components)

Drainage (Breakdown into components)

Culverts

Plantings (including seeding)

Semi-final inspection

Final Cleanup

Replace the fourth paragraph of Article 1.05.10 with the following:

If, at any time before the Department's acceptance of the Project, the Engineer requests the Contractor to remove or uncover any portion of the Project work for inspection by the Engineer, the Contractor shall do so. After such inspection is completed, the Contractor shall restore such portions of the work to the condition required by the Contract as construed by the Engineer. If the work or material exposed and inspected under this provision proves acceptable to the Engineer, the Department shall pay the Contractor for any removal, uncovering or restoration of its previous Contract work. The Department shall pay the

Contractor for such removal, uncovering, and restoration of the prior work as extra work. If the work or material exposed and inspected proves, in the judgment of the Engineer, not to conform with Contract requirements, the Contractor shall be responsible for the costs of the removal, uncovering, correction and restoration of the work and material in accordance with the Contract or as the Engineer requires.

Replace Article 1.05.12 with the following:

1.05.12—Payrolls: For each week of the Project from the first week during which an employee of the Contractor does Project work to which prevailing wage requirements apply, until the last week on which such an employee does such work, the Contractor shall furnish to the Engineer certified copies of payrolls showing

- a. the names of the employees who worked on the Project and whose work is subject to prevailing wage requirements,
- b. the specific days and hours and numbers of hours that each such employee worked on the Project, and
- c. the amount of money paid to each such employee for Project work.

Each such payroll shall include the statement(s) of compliance with prevailing wage laws required by the State of Connecticut **or** by the Federal government. Said payrolls must contain all information required by CGS 31-53 (as it may be revised). For contracts subject to Federal prevailing wage requirements, each payroll shall also contain the information required by the Davis Bacon and Related Acts (DBR). All of the payroll requirements in this Article shall also apply to the work of any subcontractor or other party that performs work on the Project site, and the Contractor shall be responsible for ensuring that each such party meets said requirements. **No Social Security Numbers (in whole or in part) shall appear on any certified payrolls.**

Every Contractor or subcontractor performing Project work is required to post the relevant prevailing wage rates as determined by the State Labor Commissioner and, on federal aid projects, those 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.

Replace the fifth paragraph of Article 1.05.17 with the following:

Prior to performing field welding on any permanent or temporary structure or component for Department projects, all field welders, field welding operators, and field tackers must possess a valid Welder **Qualification** issued by the Department's Materials **Evaluation and Specification Unit (MESU)**, as outlined in the **Department's QA Program for Materials** and must be up to date in the Department's online Welder Database. If a welder has not been engaged in welding operations on a Department project or a project acceptable to the Department over the past 6 months, or does not possess an approved welding **qualification** dated within the past 12 months from a welding agency acceptable to the Engineer, the field welder shall be required to requalify through examination. The Engineer may require requalification of anyone whose quality of work is in question.

After Article 1.05.18, add the following:

1.05.19—Field Erector Certification: Contractors and subcontractors are required to possess AISC Certifications for the following work:

1. Field erection of steel bridge girders, beams or trusses – AISC Certified Steel Erector (CSE) Certification with Bridge Erection Endorsement
2. Field erection of fabricated steel sign supports (overhead and cantilever) – AISC Certified Steel Erector (CSE) Certification
3. Field erection of steel frames on Facilities Construction projects – AISC Certified Steel Erector (CSE) Certification for Steel-Framed Buildings

SECTION 1.06 CONTROL OF MATERIALS

In the list of articles, change the title of Article 1.06.01 to “Source of Supply and Material Quality.”

Revise Article 1.06.01 as follows:

1.06.01—Source of Supply and Material Quality:

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

The Contractor must notify the Engineer of the proposed source of supply for each of the materials listed on the Anticipated Source of Material (CON-083) Form within 30 days after bid opening. Should it become necessary for the Contractor to obtain material from sources other than those indicated in the submitted Anticipated Source of Material (CON-083) Form, the Contractor shall notify the Engineer. The Engineer reserves the right to request additional information regarding such sources.

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

- a. Buy America Act (BAA):** The BAA requires that all permanently incorporated steel and iron used in the construction of the Project must have been produced and fabricated in the United States. It is the intent of this specification to require that all manufacturing processes for all steel and iron materials and products to be used for the Project, including the coating of steel and iron, occur within the United States, with the following exceptions:
- 1) The Contractor may request, in accordance with 635.410(b)(4) of Title 23 CFR, approval to include a minimal amount of foreign steel in the Project construction. This amount is defined as 1/10 of 1% of the total Contract price or \$2,500.00, whichever is greater. The cost of the foreign steel or iron is defined as its Contract value when delivered to the Project site.
 - 2) Additionally, the FHWA has granted a nationwide waiver of the requirements of 23 CFR 635.410, Buy America Act requirements, for the production of pig iron and processed, pelletized, and reduced iron ore. Items not specifically included in the waiver remain subject to the Buy America Act requirements. The Contractor may request the Engineer to seek from the FHWA a further waiver of said requirements, but it shall be at the sole discretion of the Engineer whether or not to seek such a waiver.
 - 3) A 2021 amendment to BAA, BABA (as defined below) clarifies that (A) the term “construction materials” shall not include cement and cementitious materials and aggregates such as stone, sand, or gravel; and (B) shall not include cement and cementitious materials and aggregates such as stone, sand, or gravel as inputs of the construction material.
- b. Build America, Buy America (BABA) Act:** BABA does not supersede BAA with regard to the iron and steel requirement, however it expands the requirements to include manufactured products and construction materials. Such products and materials (with exceptions) incorporated into projects “must be produced in the United States.” BABA requires the following:
- 1) All construction materials are manufactured in the United States. This means that all manufacturing processes for the construction material occurred in the United States.
 - 2) Construction materials include those listed on the Anticipated Source of Material (CON-083) Form.

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

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

When one manufacturer's product is specified in the Contract, it shall be understood that this represents the standard required. Unless otherwise stated, a comparable product of another manufacturer may be proposed by the Contractor unless the plans or special provisions indicate that no equal will be allowed. The Contractor shall submit a complete description of the proposed product, together with shop drawings, catalog cuts, product data or other descriptive literature for review in accordance with 1.05.02. Should a

product be designated as an equal, this will not relieve the Contractor from any material testing requirements or a related Certified Test Report and/or Materials Certificate that may be required.

In Subarticle 1.06.07-1 (Certified Test Report or CTR) revise the second sentence as follows:

The CTR shall be signed by a duly-authorized and responsible agent of the original manufacturer of the material(s), and the signature must include the date the CTR was signed.

In Subarticle 1.06.07-2 (Materials Certificate or MC) revise the first two sentences as follows:

A Materials Certification (MC) is a document certifying that the materials, components and equipment furnished meet all requirements of the Contract **including the location where such materials, components and equipment were produced**. The MC shall be signed by a duly-authorized and responsible agent of the organization assembling or fabricating the materials and the signature must include the date the MC was signed.

**SECTION 1.09
MEASUREMENT AND PAYMENT**

In Article 1.09.02 (Value Engineering Change Proposal) change the first sentence as follows:

These Value Engineering Change Proposal (VECP) provisions apply as encouragement to the Contractor to initiate, develop, and present to the Department for consideration **cost-reduction proposals** conceived by the Contractor, involving changes to the drawings, designs, specifications or other requirements of the Contract.

*In the 1.09.02 subarticle **Payment for accepted VECPs** delete “5. The cost savings from a VECP that is exclusively time reduction ... for 1 day under the Contract.”*

*After the Article 1.09.04 title **Extra and Cost Plus Work:** insert a return and add the following Subarticle title “**A. Extra Work:**”*

*Before the second paragraph of Article 1.09.04 insert the following Subarticle title “**B. Cost Plus Work:**”*

*In the second to last paragraph of Subarticle 1.09.04(a), change the end of the first sentence as follows:“... when the nature of the pertinent Project work is such that, in the **judgment** of the Engineer, a superintendent was required for that work.”*

*After the first sentence of Article 1.09.05 (**Eliminated Items**) add the following:*

If an item is entirely eliminated from the Contract, the Department will pay the Contractor only for costs which it incurred in connection with the eliminated item prior to the date upon which the Engineer provided the Contractor with written notice of said elimination.”

**SECTION 1.20-1.05
 CONTROL OF THE WORK FOR
 FACILITIES CONSTRUCTION**

In the list of Articles, revise the title of Article 1.20-1.05.19 to the following:

1.20-1.05.19—Facilities Construction - Field Erector Certification

Replace the fourth paragraph of Article 1.20-1.05.03 with the following:

If, in the judgment of the Engineer, any material provided by the Contractor, any finished product in which the materials were used, or any work performed does not conform to the plans and specifications and has resulted in an unacceptable product, the Contractor shall, at its own expense, either cure or remove and replace the unaccepted work and material, as the Engineer directs.

Replace the third paragraph of Article 1.20-1.05.05 with the following:

Record Drawings: The Contractor shall maintain a complete set of Record Drawings by maintaining a clean, undamaged set of Contract drawings (original Contract plans as modified by Addenda and Construction Orders), Working Drawings (including any related calculations), Shop Drawings, and Coordination Drawings. The Contractor shall mark whichever drawings within the set that are most capable of fully and accurately showing as-built conditions. The Contractor shall include hyperlinks on the Contract plans to cross-reference to the related Working Drawings, Shop Drawings, Coordination Drawings, as well as RFIs and RFCs. The Contractor shall give particular attention to concealed elements that would be difficult to measure and record at a later date. The Contractor shall use separate colors to distinguish between variations in separate categories of the Project work.

Delete the sixth paragraph of Article 1.20-1.05.05:

Record Survey: The Contractor shall submit a Record Survey in accordance with other Contract requirements.

Replace the first and second paragraphs of Article 1.20-1.05.08 with the following:

1.20-1.05.08—Facilities Construction - Schedules and Reports: When the Contract does not include the Project Coordinator item, the following shall apply:

Baseline Bar Chart Construction Schedule: Within 20 calendar days after contract award the Contractor shall develop a comprehensive bar chart as a baseline schedule for the project. The bar chart schedule shall be submitted to the Engineer for review and comment and shall be based on the following guidelines:

Replace the General Activities Applicable to all projects list under 1.20-1.05.08-1 with the following:

Project Constraints

- Winter shutdowns
- Environmental permits/application time of year restrictions
- Milestones
- Third Party approvals
- Long lead time items (procurement and fabrication of major elements)
- Adjacent Projects or work by others

Award

Notice to Proceed

Signing (Construction, temporary, permanent by location)

Mobilization
 Permits as required
 Field Office
 Utility Relocations
 Submittals/shop drawings/working drawings/product data
 Construction of Waste Stock pile area
 Clearing and Grubbing
 Removal of Invasives (if in Contract)
 Earthwork (Borrow, earth ex, rock ex etc.)
 Traffic control items (including illumination and signalization)
 Pavement markings
 Roadway Construction (Breakdown into components)
 Drainage (Breakdown into components)
 Culverts
 Plantings (including seeding)
 Semi-final inspection
 Final Cleanup

Replace the fourth paragraph of Article 1.20-1.05.10 with the following:

If, at any time before the Department's acceptance of the Project, the Engineer requests the Contractor to remove or uncover any portion of the Project work for inspection by the Engineer, the Contractor shall do so. After such inspection is completed, the Contractor shall restore such portions of the work to the condition required by the Contract as construed by the Engineer. If the work or material exposed and inspected under this provision proves acceptable to the Engineer, the Department shall pay the Contractor for any removal, uncovering or restoration of its previous Contract work. The Department shall pay the Contractor for such removal, uncovering, and restoration of the prior work as extra work. If the work or material exposed and inspected proves, in the judgment of the Engineer, not to conform with Contract requirements, the Contractor shall be responsible for the costs of the removal, uncovering, correction and restoration of the work and material in accordance with the Contract or as the Engineer requires.

Replace Article 1.20-1.05.12 with the following:

1.20-1.05.12—Facilities Construction - Payrolls: For each week of the Project from the first week during which an employee of the Contractor does Project work to which prevailing wage requirements apply, until the last week on which such an employee does such work, the Contractor shall furnish to the Engineer certified copies of payrolls showing the names of the employees who worked on the Project and whose work is subject to prevailing wage requirements,

- (a) the specific days and hours and numbers of hours that each such employee worked on the Project, and
- (b) the amount of money paid to each such employee for Project work.

Each such payroll shall include the statement(s) of compliance with prevailing wage laws required by the State of Connecticut or by the Federal government. Said payrolls must contain all information required by CGS Section 31-53 (as it may be revised). For contracts subject to Federal prevailing wage requirements, each payroll shall also contain the information required by the Davis Bacon and Related Acts (DBR). All of the payroll requirements in this Article shall also apply to the work of any subcontractor or other party that performs work on the Project site, and the Contractor shall be responsible for ensuring that each such party meets said requirements. **No Social Security Numbers (in whole or in part) shall appear on any certified payrolls.**

Every Contractor or subcontractor performing Project work is required to post the relevant prevailing wage rates as determined by the State Labor Commissioner and, on federal aid projects, those 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.

Replace the fifth paragraph of Article 1.20-1.05.17 with the following:

Prior to performing field welding on any permanent or temporary structure or component for Department projects, all field welders, field welding operators, and field tackers must possess a valid Welder Qualification issued by the Department's Materials Evaluation and Specification Unit (MESU), as outlined in the [Department's QA Program for Materials](#) and must be up to date in the Department's online Welder Database. If a welder has not been engaged in welding operations on a Department project or a project acceptable to the Department over the past 6 months, or does not possess an approved welding qualification dated within the past 12 months from a welding agency acceptable to the Engineer, the field welder shall be required to requalify through examination. The Engineer may require requalification of anyone whose quality of work is in question.

Replace the title of Article 1.20-1.05.19 with the following:

1.20-1.05.19—Facilities Construction - Field Erector Certification:

SECTION 1.20-1.06
CONTROL OF MATERIALS FOR
FACILITIES CONSTRUCTION

In the list of articles, change the title of Article 1.20-1.06.01 to “Facilities Construction - Source of Supply and Material Quality.”

Revise Article 1.20-1.06.01 as follows:

1.20-1.06.01—Facilities Construction - Source of Supply and Material Quality:

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

The Contractor must notify the Engineer of the proposed source of supply for each of the materials listed on the Anticipated Source of Material (CON-083) Form within 30 days after bid opening. Should it become necessary for the Contractor to obtain material from sources other than those indicated in the submitted Anticipated Source of Material (CON-083) Form, the Contractor shall notify the Engineer. The Engineer reserves the right to request additional information regarding such sources.

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

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

- 1) The Contractor may request, in accordance with 635.410(b)(4) of Title 23 CFR, approval to include a minimal amount of foreign steel in the Project construction. This amount is defined as 1/10 of 1% of the total Contract price or \$2,500.00, whichever is greater. The cost of the foreign steel or iron is defined as its Contract value when delivered to the Project site.
- 2) Additionally, the FHWA has granted a nationwide waiver of the requirements of 23 CFR 635.410, Buy America Act requirements, for the production of pig iron and processed, pelletized, and reduced iron ore. Items not specifically included in the waiver remain subject to the Buy America Act requirements. The Contractor may request the Engineer to seek from the FHWA a further waiver of said requirements, but it shall be at the sole discretion of the Engineer whether or not to seek such a waiver.
- 3) A 2021 amendment to BAA, BABA (as defined below) clarifies that (A) the term “construction materials” shall not include cement and cementitious materials and aggregates such as stone, sand, or gravel; and (B) shall not include cement and cementitious materials and aggregates such as stone, sand, or gravel as inputs of the construction material.

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

- 1) All construction materials are manufactured in the United States. This means that all manufacturing processes for the construction material occurred in the United States.
- 2) All manufactured products used in the Project are produced in the United States. This means the manufactured product was manufactured in the United States, and the cost of the components of the manufactured product that are mined, produced, or manufactured in the United States is greater than 55% of the total cost of all components of the manufactured product, unless another standard for determining the minimum amount of domestic content of the manufactured product has been

established under applicable law or regulation. Currently, manufactured products are considered to be in their final form upon arrival at the job site. This requirement is not applicable to Federal-Aid highway projects.

3) **Construction materials include those listed on the Anticipated Source of Material (CON-083) Form.**

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

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

When one manufacturer's product is specified in the Contract, it shall be understood that this represents the standard required. Unless otherwise stated, a comparable product of another manufacturer may be proposed by the Contractor unless the plans or special provisions indicate that no equal will be allowed. The Contractor shall submit a complete description of the proposed product, together with shop drawings, catalog cuts, product data or other descriptive literature for review in accordance with 1.20-1.05.02. Should a product be designated as an equal, this will not relieve the Contractor from any material testing requirements or a related Certified Test Report and/or Materials Certificate that may be required.

In Subarticle 1.20-1.06.07-1 (Certified Test Report or CTR) revise the second sentence as follows:

The CTR shall be signed by a duly-authorized and responsible agent of the original manufacturer of the material(s), and the signature must include the date the CTR was signed.

In Subarticle 1.20-1.06.07-2 (Materials Certificate or MC) revise the first two sentences as follows:

A Materials Certification (MC) is a document certifying that the materials, components and equipment furnished meet all requirements of the Contract **including the location where such materials, components and equipment were produced**. The MC shall be signed by a duly-authorized and responsible agent of the organization assembling or fabricating the materials and the signature must include the date the MC was signed.

In the second to last paragraph of Article 1.20-1.06.08 change the last sentence to "... unless in the Engineer's judgment said failure is deemed to be an emergency..."

SECTION 1.20-1.09
MEASUREMENT AND PAYMENT FOR
FACILITIES CONSTRUCTION

In Article 1.20-1.09.02 (Facilities Construction - Value Engineering Change Proposal) change the first sentence as follows:

“ These Value Engineering Change Proposal (VECP) provisions apply as encouragement to the Contractor to initiate, develop, and present to the Department for consideration **cost-reduction proposals** conceived by the Contractor, involving changes to the drawings, designs, specifications or other requirements of the Contract.”

*In the 1.20-1.09.02 subarticle **Payment for accepted VECPs** delete “5. The cost savings from a VECP that is exclusively time reduction ... for 1 day under the Contract.”*

*After the Article 1.20-1.09.04 title **Facilities Construction - Extra and Cost Plus Work**: insert a return and add the following Subarticle title “**A. Extra Work**: ”*

*Before the second paragraph of Article 1.20-1.09.04 insert the following Subarticle title “**B. Cost Plus Work**:”*

*In the second to last paragraph of Subarticle 1.20-1.09.04(a), change the end of the first sentence as follows:“... when the nature of the pertinent Project work is such that, in the **judgment** of the Engineer, a superintendent was required for that work.”*

*After the first sentence of Article 1.20-1.09.05 **Facilities Construction - Eliminated Items** add the following sentence:*

“If an item is entirely eliminated from the Contract, the Department will pay the Contractor only for costs which it incurred in connection with the eliminated item prior to the date upon which the Engineer provided the Contractor with written notice of said elimination.”

After Section 1.20-9.75, add the following New Section 1.20-9.80:

**SECTION 1.20-9.80
CONSTRUCTION SURVEYING FOR
FACILITIES CONSTRUCTION**

1.20-9.80.01—Facilities Construction - Description

1.20-9.80.02—Facilities Construction - Materials

1.20-9.80.03—Facilities Construction - Construction Methods

1.20-9.80.04—Facilities Construction - Method of Measurement

1.20-9.80.05—Facilities Construction - Basis of Payment

1.20-9.80.01—Facilities Construction - Description: Work under this item shall consist of furnishing labor, equipment, tools and materials to perform surveying, staking, verification, recording of data and calculations as necessary to construct the Project, from existing layout to acceptance of the work according to the plans. Work under this item shall conform to Section 20-300b-1 to 20-300b-20 inclusive of the Department of Consumer Protection, Regulations of CT State Agencies and as supplemented herein.

1.20-9.80.02—Facilities Construction - Materials: Stakes used for control staking shall be a minimum of 1 inch × 1 inch wide and a minimum length of 36 inches. Stakes shall be legibly marked and shall be visible at all times. The stakes shall be durable enough to last for the duration of the Contract. In areas where traditional staking cannot be established, the Contractor may use other materials or methods to mark critical locations, as approved or directed by the Engineer.

1.20-9.80.03—Facilities Construction - Construction Methods:

I Submittals:

1. The Contractor shall provide technically qualified survey crews experienced in construction surveying. All Project surveying and staking shall be performed by or under the supervision of either a Connecticut Licensed Land Surveyor or a Level III Survey Technician certified by the National Society of Professional Surveyors.

The name, authority, relevant experience, and qualifications of the person with overall responsibility for construction surveying and staking shall be submitted to the Engineer ten (10) days prior to any physical work.

2. If using Automated Machine Guidance (AMG) methods, the following information shall also be submitted to the Engineer ten (10) days prior to any physical work:
 - A. A written technology statement that includes:
 - i. The manufacturer, model, and software version of the AMG equipment.
 - ii. Verification that the final 3D data which is provided in the Plans is compatible with the AMG equipment.
 - B. Personnel qualifications:
 - i. The name, authority, relevant experience, and qualifications of the person with overall responsibility for the AMG system.
 - ii. The name, authority, and relevant experience of personnel directly responsible for operating the AMG equipment.
 - C. A Quality Control Plan for mechanical calibration and maintenance of both surveying and AMG controlled construction equipment. Include the frequency and types of checks performed.

II Equipment Requirements:

1. The Contractor's survey instruments and supporting equipment shall be capable of achieving the specified tolerances in Table 1.20-9.80-1.
2. All instrumentation used on the Project shall have been serviced and calibrated within six (6) months prior to use on the Project, and then every year thereafter.
3. The Contractor shall obtain the Engineer's concurrence prior to using construction equipment equipped with Global Navigation Satellite System (GNSS) or Robotic Total Station (RTS) controlled by an AMG system in the construction of subgrade, subbase and base course aggregate courses, or other construction operations.
4. Tools and supplies shall be of the type and quality suitable for survey work.
5. Stakes and hubs shall be of a sufficient length to provide a solid set in the ground, with sufficient surface area above ground for necessary legible and durable markings.

III General Requirements:

1. The Contractor's Construction Schedule shall include dates and sequences of major surveying

activities in accordance with 1.20-1.05.08 for Facilities Construction.

2. The Department will furnish the initial horizontal control points, vertical control points and data for use in establishing control for completion of the work. The Contractor shall recover and preserve the initial reference and control points and shall notify the Engineer of missing control points.
3. The Department will furnish data relating to horizontal and vertical alignments, theoretical slope staking catch points, and other design data. The Contractor is responsible for reformatting and any additional calculations that may be required for the convenient use of the State-furnished data. The Contractor shall provide immediate notification of apparent errors or omissions in the initial staking or in the State-furnished data.
4. The Contractor shall provide survey data and measurements in the format(s) acceptable to the Engineer and submit on a schedule determined by the Engineer. Field data and supporting documentation will become the property of the Department upon completion of the work.
5. Prior to major surveying activities, a survey coordination meeting shall be held, and the following agenda items shall be discussed and coordinated with the Engineer:
 - A. Surveying and staking methods;
 - B. Stake marking;
 - C. Grade control for courses of material;
 - D. Referencing;
 - E. Structure control;
 - F. Field staking data;
 - G. Localization of the GNSS systems to the Department-established control points;
 - H. Protection of existing survey markers; and
 - I. Other procedures and controls necessary for the work.
6. The Contractor shall not start the physical work until the required survey or three-dimensional (3D) verification data for the affected work has been reviewed by the Engineer. Review of the construction survey does not relieve the Contractor of responsibility for correcting errors and omissions discovered during the work and for bearing additional costs associated with the error or omission.
7. The Contractor shall maintain legibility of survey markings for the duration of the Project or until notified by the Engineer.
8. Upon completion of the Project, the Contractor shall remove and dispose of all staking material used on the Project.
9. Should the establishment or re-establishment of property acquisition lines, highway lines, or non-access lines be required, the Contractor shall notify the Engineer at least two (2) weeks in advance of need.
10. The Contractor shall provide and maintain safe facilities for convenient access by Department forces to all survey stakes, control points, batter boards, and references.

IV Specific Requirements:

1. **Control points:** The Contractor shall
 - A. Relocate initial horizontal and vertical control points in conflict with construction to areas that will not be disturbed by construction operations.
 - B. Furnish the coordinates, elevations, and support documentation for the relocated points before the initial points are disturbed.
 - C. Set durable markers for survey control that uniquely identifies the points.
 - D. Furnish the GNSS localization results at least seven (7) days before beginning construction layout survey work. If necessary, the GNSS localization calibration and associated 3D model shall be broken into two or more zones to maintain the localized relationship between control points and original ground.
2. **Centerline establishment:** The Contractor shall establish or reestablish centerline at roadway design cross-section locations as necessary to construct the work.
3. **Original ground topographic verification:** In areas where the plan existing ground elevation and the actual ground elevation are not within a tolerance of ± 0.25 feet, the Contractor shall immediately notify the Engineer.
4. **Horizontal Slope Limits and Reference Stakes:** The Contractor shall
 - A. At a minimum, set stakes on both sides of centerline at the horizontal slope limit at cross-section intervals.

- B. When the slope is designed with a roll at the top and toe, two stakes shall be set on each side of the roadway, one to mark the intersection of the normal cut or fill with existing ground and the other to determine the limit of the roll.
5. **Clearing and Grubbing Limits:** The Contractor shall set clearing and grubbing limits on both sides of centerline.
6. **Finish-grade stakes:** The Contractor shall
- A. Set finish-grade stakes for grade elevations and horizontal alignment, on centerline and on each shoulder at design roadway cross-section intervals.
 - B. Reset finish-grade stakes as many times as necessary for construction of the roadway.
 - C. When the centerline curve radius is less than or equal to 250 feet, use a maximum spacing between stakes of 25 feet.
 - D. When the centerline curve radius is greater than 250 feet, use a maximum spacing between stakes of 50 feet.
7. **Structures:** The Contractor shall provide survey and staking data in accordance with the above requirements for Structures as follows:
- A. **Culverts:** Verify and set culvert locations at the inlet, outlet, and inlet basin points according to the plans. If the proposed culvert design does not fit field conditions, notify the Engineer and provide the following:
 - i. Surveyed ground profile along the culvert centerline;
 - ii. Slope catch points at the inlet and outlet.
 - B. **Bridges:** Set adequate horizontal, vertical, reference and Working Points for bridge substructure and superstructure components. Field verify the girders, bridge chord, bridge tangent, or control lines are as specified on the bridge plans. Also establish and reference the centerline of each pier, bent, and abutment.

The Contractor shall establish the center line of bearings for all bridge abutments and piers, by setting offset hubs or reference points, so located and protected to ensure they remain undisturbed until such time as they are no longer needed. The Contractor shall mark the location of anchor bolts to be installed, establish the elevation of bearing surfaces and check bearing plates to ensure installation at their proper elevation. Before the erection of structural steel or concrete beams the Contractor shall verify the locations, both vertically and horizontally, of all bearings and the distances between associated bearings.

The Contractor shall be responsible for conducting all surveys to verify the structural steel profile and alignment are as specified. The Contractor must submit survey and verification in a form acceptable to the Engineer a minimum of 7 days prior to installing the falsework and forms.
 - C. **Retaining walls and Reinforced Soil Slopes:** The Contractor shall set adequate horizontal, vertical, reference and Working Points to perform the work.
8. **Borrow and Waste sites:** The Contractor shall
- A. Perform field work necessary for initial layout and measurement of borrow or waste sites.
 - B. Establish site limits and clearing limits.
 - C. Measure both original and final ground conditions and submit cross-sections as directed by the Engineer.
9. **Utility Relocations:** The Contractor shall provide additional reference stakes to assist the Engineer and public utility personnel to accurately identify the proposed locations for utility facilities to be relocated. At least 2 weeks prior to the scheduled relocation of public utilities, the Contractor shall stake out the following features throughout the limits of utility relocations at a maximum spacing of 25 feet, unless directed otherwise by the Engineer:
- A. Edge of road on the side adjacent to the proposed utility relocations.
 - B. Both edges of sidewalks, where shown on the plans.
 - C. Proposed drainage location(s) and invert elevation(s) at proposed utility locations.
 - D. Finished grade where existing utility facilities will be reset or relocated.
10. **Regulated Areas:** The Contractor shall install and maintain reference stakes at 25 foot spacing, or as directed by the Engineer, along the permitted permanent or temporary regulated impacted areas depicted in the permit applications. Each stake shall be legibly marked identifying the baseline station and offset, and the feature it represents.
11. **Pavement Markings:** Prior to any resurfacing or obliteration of existing pavement markings, the Contractor and a representative of the Engineer shall establish and document pavement marking control points from the existing markings within the limits of the proposed pavement markings or

pavement marking grooves. These control points shall be used to reestablish the positions of the lanes, the beginnings and endings of tapers, channelization lines for on- and off-ramps, lane-use arrows, stop bars, driveways, private drives, road entrances, and any lane transitions in the Project area, including all line striping grooving. The Contractor shall use these control points to provide appropriate pre-marking prior to the installation of final markings, including grooves.

The Contractor shall provide and maintain reference stakes or markings immediately off the edge of pavement, at 100 foot intervals and at any point where there is a change in pavement markings. If the Contractor proposes an alternative method to establish and document pavement marking control points, it must be approved by the Engineer.

For roadways where the existing pavement markings need to be reestablished or pavement marking grooves are to be installed on non-limited access roadways, the markings shall be adjusted as directed by the Engineer. These adjustments are to provide wider shoulders to accommodate pedestrian and bicycle traffic while maintaining through travel lane widths of no less than 11 feet.

Unless otherwise noted in the Project documents, lane and shoulder widths for commonly encountered half sections shall be established as shown in the table below:

Centerline to curb or edge of road	Lane width	Shoulder width
12 to 16 feet	11 feet	Remaining Pavement
17 to 20 feet	12 feet	Remaining Pavement

For Projects that only consist of removal and replacement of pavement markings, the requirement for a licensed land surveyor to supervise the staking is waived.

- 12. **Miscellaneous survey and staking:** The Contractor shall survey and stake other work such as guiderail, curb and gutter, seeding, regulated areas, watercourses and excavation limits for structures. When staking increments are not specified, the Contractor shall propose increments for the Engineer’s review. The Contractor shall maintain or replace these stakes until the Engineer approves their removal.

**Table 1.20-9.80-1
Construction Survey Staking Tolerances¹**

Staking Phase	Horizontal	Vertical
Control points set from existing control points. ²	±0.03 feet	±0.01 feet × √N
Centerline points including all points of curvature and references.	±0.06 feet	±0.03 feet
Slope-stake and slope-stake references. ³	±0.25 feet	±0.25 feet
Culverts, ditches, and minor drainage structures stakes.	±0.25 feet	±0.06 feet
Retaining walls stakes.	±0.06 feet	±0.03 feet
Bridge substructures and superstructure stakes. ⁴	±0.03 feet	±0.03 feet
Pavement markings stakes. ⁵	±0.50 feet	N/A
Curb and gutter stakes.	±0.06 feet	±0.03 feet
Working Points. ⁴	±0.03 feet	N/A
Clearing and grubbing limit stakes.	±1.00 feet	N/A
Roadway subgrade finish stakes.	±0.16 feet	±0.03 feet
Roadway finish grade stakes.	±0.16 feet	±0.03 feet

¹ At statistical 95% confidence level. Tolerances are relative to existing control points.

² N is the number of instrument setups.

³ Take the cross-sections normal to the centerline ±1 degree.

⁴ Bridge control is established as a local network and the tolerances are relative to that network.

⁵ This tolerance also applies to alternative methods of establishing and documenting pavement marking control points from the existing markings, such as GPS recording.

- 13. For Facilities Construction:** Existing survey is not guaranteed. The Contractor shall:
- A. Investigate and verify the existence and location of underground utilities and other elements affecting the contract work before beginning site work.
 - B. Furnish information that is necessary to adjust, move or relocate existing structures, utility poles, lines, services, or other utility appurtenances affected by construction. Coordinate with authorities performing work and/ or having jurisdiction.
 - C. Verify layout information shown on the plans, in relation to the control points and existing benchmarks before proceeding to layout the Project work. Notify the Engineer if discrepancies are discovered. Preserve and protect permanent benchmarks and control points during construction operations. Do not change or relocate benchmarks or control points without the Engineer’s prior written approval. Promptly report lost or destroyed control points, or the need to relocate permanent benchmarks or control points because of necessary changes in grades or locations. Promptly replace lost or destroyed benchmarks and control points. Base replacements on the original survey control points.
 - D. Establish and maintain a minimum of (2) permanent benchmarks on the Project Site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark. Record benchmark locations, with horizontal and vertical data, on Project Record Documents. Provide temporary reference points sufficient to locate the work where the actual location or elevation of layout points cannot be marked. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
 - E. Work from lines and levels established by the control survey. Establish benchmarks and control points to set lines and levels at each area of construction as needed to locate each element of the Project. Calculate and measure required dimensions within indicated or recognized tolerances. Do not scale plans to determine dimensions. Advise entities engaged in construction activities, of marked lines and levels provided for their use. As construction proceeds, check every major element for line, level and plumb.
 - F. Locate and lay out site improvements, including pavements, stakes for grading, fill and topsoil placement, utility slopes and invert elevations by instrumentation and similar appropriate means. The Contractor shall identify and document by survey the extent, elevation, and location of all foundations and capped utilities to be left in place and backfilled. Appropriate scaled marked up drawings shall be furnished to the Engineer PRIOR to backfilling.
 - G. Locate and lay out control lines and levels for structures, building foundations, column grids and locations, floor levels including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from (2) or more locations.
 - H. Maintain a surveyor's log of control and other survey work. Make this log available to the Engineer for reference. Record deviations from required lines and levels, and advise the Engineer when deviations that exceed indicated or recognized tolerances are detected. On Project Record Drawings, record deviations that are accepted by the Engineer and not corrected. Record the location of utilities at the time of installation in the log as well as on the As-Built drawings for permanent record. The recording Land Surveyor shall place its registration seal and accuracy statement regarding location of exterior underground utility lines on the utility plans of As-Built drawings.

1.20-9.80.04—Facilities Construction - Method of Measurement: Construction Surveying, being paid on a lump sum basis, will not be measured for payment. Prior to beginning the work, the Contractor shall submit a proposed schedule of values for review and concurrence by the Engineer.

1.20-9.80.05—Facilities Construction - Basis of Payment: Construction Surveying will be paid for at the Contract lump sum price for "Construction Surveying," based on completed portions of the work. This price shall include all labor, submittals, maintenance, materials, tools, equipment, removal of materials and all work incidental thereto.

Pay Item	Pay Unit
Construction Surveying	l.s.

**SECTION 2.11
ANTI-TRACKING PAD**

Replace Section 2.11 with the following:

**SECTION 2.11
ANTI-TRACKING PAD**

- 2.11.01—Description**
- 2.11.02—Materials**
- 2.11.03—Construction Methods**
- 2.11.04—Method of Measurement**
- 2.11.05—Basis of Payment**

2.11.01—Description: This work shall consist of furnishing, installing, maintaining, and removing, a crushed stone Anti-Tracking Pad on geotextile filter fabric. All disturbed areas affected by the Anti-Tracking Pad shall be restored to the original grade or as shown on the plan. If shown on the plans or ordered by the Engineer, the restored areas shall be stabilized with seeding.

2.11.02—Materials:

The crushed stone shall meet the gradation requirements of M.01.02 for No. 3 stone.

Geotextile filter fabric shall meet the requirements of 7.55 and M.08.01-19.

Topsoil, if necessary, shall meet the requirements of M.13.01.

Seed, if necessary, shall meet the requirements of M.13.04, or as specified on the plans.

Fertilizer, if necessary, shall meet the requirements of M.13.03.

Mulch, if necessary, shall meet the requirements of M.13.05.

2.11.03—Construction Methods: Clear area of Anti-Tracking Pad of all vegetation and excavate to a maximum depth of 4 inches. Place geotextile filter fabric over the full width and length of excavated area and cover with No. 3 crushed stone to a minimum depth of 6 inches.

The Anti-Tracking Pad shall be uniformly graded to produce the entry and exit path to the Site for all construction equipment. The Pad shall be maintained of sufficient grading and stone surface to capture all soils and sediment from equipment prior to such exiting from the Site.

Crushed stone shall be replenished or replaced as necessary or as ordered by the Engineer to assure sufficient capture of sediment at the construction Site. Any sediment or crushed stone tracked off the Site shall be immediately cleaned, swept and removed by the Contractor at no cost to the State.

2.11.04—Method of Measurement: This work will be measured for payment by the number of square yards of accepted anti-tracking pad completed as shown on the plans or as ordered by the Engineer.

2.11.05—Basis of Payment: Payment for this work will be made at the Contract unit price per square yard for "Anti-Tracking Pad," which shall include furnishing and placing all material, including the geotextile; for maintaining the Anti-Tracking Pad during the Project construction period; for removing the Anti-Tracking Pad after completion of the Project; for restoring the Site, including any required seeding; and for all labor, equipment, tools, and incidentals required to complete the work as well as the cleaning and sweeping of any sediment or crushed stone tracked off the Site.

Clearing and grubbing required to install the Anti-Tracking Pad will be paid under the item "Clearing and Grubbing."

Pay Item	Pay Unit
Anti-Tracking Pad	s.y.

SECTION 2.86
DRAINAGE TRENCH EXCAVATION,
ROCK IN DRAINAGE TRENCH EXCAVATION

Replace Subarticle 2.86.03-4 with the following:

- (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. **Material placed around pipes shall be deposited on both sides to approximately the same elevation at the same time.**

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.

**SECTION 4.01
CONCRETE FOR PAVEMENT**

Delete Section 4.01 in its entirety.

**SECTION 4.06
BITUMINOUS CONCRETE**

4.06.01—Description**4.06.02—Materials****4.06.03—Construction Methods**

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

4.06.04—Method of Measurement**4.06.05—Basis of Payment**

4.06.01—Description: Work under this Section shall include the production, delivery, placement and compaction of a uniform textured, non-segregated, smooth 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.

Extended Season Paving Plan: Required to address operations when ambient temperature or pavement temperature is expected to be less than 50°F.

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

In-Season Paving: Operations when ambient temperature and pavement temperature is 50°F or greater.

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

Leveling Course: A thin lift of HMA placed at an average consistent thickness, usually about an inch, as indicated on the plans to correct minor variations in the contour of the existing pavement surface.

Lift: An application of 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.

Wedge Course: A lift or multiple lifts of HMA placed at a varying thickness as indicated on the plans to increase or decrease the cross slope of the existing pavement surface.

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

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

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

4.06.03—Construction Methods

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

- 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 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.

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

Lighting for Operations: As needed for paving operations, the Contractor shall provide sufficient artificial lighting to enable the Engineer to thoroughly inspect every phase of the work. The type and number of lights to be used on each piece of equipment shall be documented by the Contractor in the Project Specific Quality Control Plan. A minimum of 10 foot candle (fc) (or approximately 108 lumens) within a twenty-five-foot radius from millers, pavers, and transfer vehicles shall be provided by the lighting at all times. A

minimum of 1 fc (or approximately 11 lumens) within a sixty foot radius from rollers shall be provided at all times. Lighting shall be oriented to minimize glare to passing traffic. The Contractor shall furnish a light meter to the Engineer to verify illumination levels. The light meter shall be capable of measuring light illuminance from LED, Fluorescent, Halogen, and other lights being used at the levels specified with a rated accuracy of $\pm 3\%$ or better.

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

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

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

The 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 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 30 calendar days) shall meet the greater than 50 mph requirements shown above.

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

Subbase material shall be free of standing water prior to placement of the mixture,

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

Tack Coat Application: The Contractor shall protect appurtenances from tracking or splattering of tack coat material. All tack coat material shall be applied by pressurized spray that results in a uniform application rate over the entire surface being paved.

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

The Engineer must approve the equipment and the method of measurement prior to use. The material for tack coat shall be heated to $160^{\circ}\text{F} \pm 10^{\circ}\text{F}$ and shall not be further diluted.

Tack coat shall be allowed sufficient time to break (**cure**) 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 **is completed**, including **quality control, sampling for density testing, and inspection activities.**

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

- have a minimum accuracy value of $\pm 1\%$ of reading or $\pm 2^{\circ}\text{F}$, whichever is greater.
- are in agreement within 5°F when measuring ambient, base, and mix temperature.

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

The placement temperature range shall be listed in the Quality Control Placement Plan and shall meet the requirements of Table M.04.03-4. Any material that falls outside the specified temperature range as measured by **two of the three** thermometers may be rejected.

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

Where it is 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 course, shall not be subject to thickness and area adjustments.

1. Thickness: Where the average thickness of the lift exceeds that shown on the plans beyond the

tolerances shown in Table 4.06-3, the Engineer will calculate the thickness adjustment in accordance with 4.06.04.

TABLE 4.06-3: Thickness Tolerances

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

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

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

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

Compaction: The Contractor shall compact the mixture to meet the density requirements as stated in 4.06.04 for any lift placed with a thickness of 1 1/2 inches or greater, and eliminate all roller marks without displacement, shoving, cracking, or aggregate breakage. This shall include wedge courses when the wedge thickness is 1 1/2 inches or greater within a single paver pass.

When placing a lift with a specified thickness less than 1 1/2 inches the Contractor shall provide a minimum rolling pattern as determined by the development of a compaction curve. This shall include wedge courses when the wedge or any portion of the wedge thickness is less than 1 1/2 inches within a single paver pass. The procedure to be used shall be documented in the Contractor's QCP for placement and demonstrated on the first day of placement.

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

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

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

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

Surface Requirements:

Each lift of the surface course shall not vary more than 1/4 inch from a Contractor-supplied 10 foot straightedge. For all other lifts of 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 or as directed by the Engineer in the final lift. The requirement for paving full width "curb to curb" as described in Method II may be waived if addressed in the QC plan and approved by the Engineer.

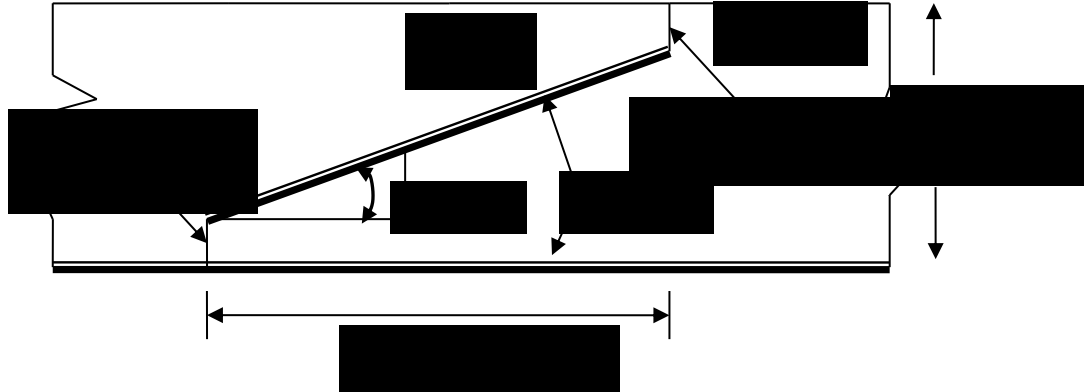
The taper portion of the wedge joint shall be evenly compacted using equipment other than the paver or notch wedge joint device. The compaction device shall be the same width as the taper and not reduce the angle of the wedge or ravel the top notch of the joint during compaction.

When placed on paved surfaces, the area below the sloped section of the joint shall be treated with tack

coat. The top surface of the sloped section of the joint shall be treated with tack coat prior to placing the completing pass.

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

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



Any exposed wedge joint must be located to allow for the free draining of water from the road surface. The Engineer reserves the right to define the paving limits when using a wedge joint that will be exposed to traffic.

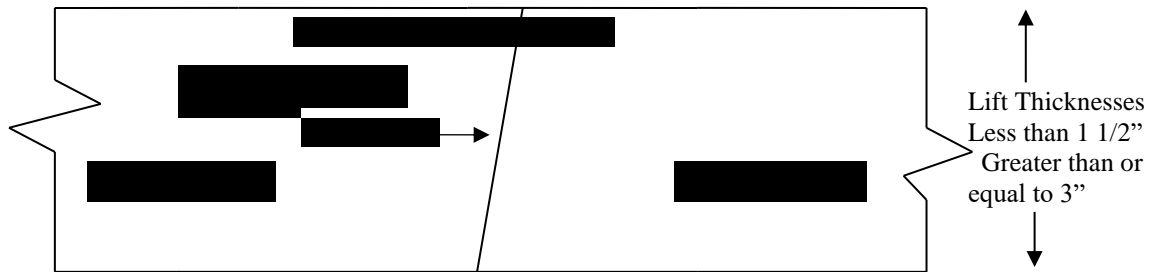
If Method I cannot be used on those lifts which are 1 1/2 inches to 3 inches, Method III may be substituted according to the requirements below for “Method III - Butt Joint with Hot Poured Rubberized Asphalt Treatment.”

Method II - Butt Joint:

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

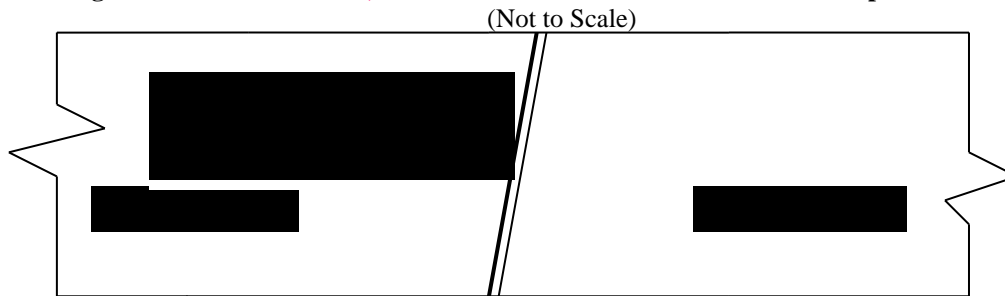
When using this method, the Contractor must complete full width “curb to curb” paving when the vertical edge exposed to traffic would be greater than one inch, unless otherwise allowed by the Engineer.

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



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

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

Figure 4.06-3: Method III, Butt Joint with Hot Poured Rubberized Asphalt Treatment

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 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 that is applicable to all projects for the year, a Project Summary Sheet that supplements the standard QCP that details Project-specific information, and, if applicable, a separate Extended Season Paving Plan to address project specific operations expected to occur when ambient temperature or pavement temperature is less than 50°F.

QCPs shall be submitted to the Department for approval each calendar year and at a minimum of 30 days prior to production or placement. The Extended Season QCP shall be submitted no later than October 15, but prior to anticipated ambient temperature below 50°F.

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

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

QCP for Placement: The Standard QCP, Project Summary Sheet, and Extended Season Paving Plan shall conform to the format provided on the [Advisory Team web page](#).

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

the same requirements described in 4.06.03-10.

9. Temperature and Seasonal Requirements: Paving, including placement of temporary pavements, shall be divided into 2 seasons, "In-Season" and "Extended-Season." The following requirements shall apply unless otherwise authorized or directed by the Engineer:

1. Mixtures shall not be placed on subbase material that is frozen. Mixtures or tack coat shall not be placed when the air or pavement surface temperature is 35°F or less.
2. Should paving operations be scheduled during Extended Season temperatures, the Contractor must submit an Extended Season Paving Plan for the Project that addresses minimum delivered mix temperatures that meet the requirements of Table M.04.03-4. The Plan shall also include:
 - a. if WMA, PMA, or other additives are being used;
 - b. method of determining mix cooling rate after placement along with maximum paver speed;
 - c. enhanced rolling patterns;
 - d. 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:

1. The Contractor shall obtain cores in accordance with AASHTO R 67 for the determination of mat and longitudinal joint density of bituminous concrete pavements. The Contractor's representative obtaining samples must be a certified NETTCP HMA Paving Inspector, NETTCP HMA Plant Technician, or has successfully completed the HMA Field Sampling Course administered by The Connecticut Advanced Pavement Laboratory (CAP Lab). Within three (3) calendar days of placement, mat and joint cores shall be extracted on each lift with a specified thickness of 1 1/2 inches or more. That time frame may be extended to a maximum of five (5) days due to inclement weather, State holidays or other access restrictions beyond the control of the Contractor. Joint cores shall not be extracted on HMA S1.0 lifts.

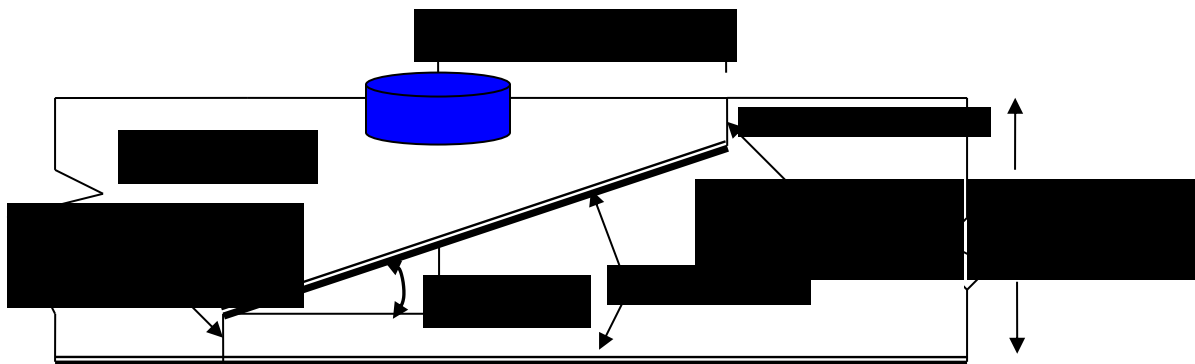
The Contractor shall extract cores from random locations determined by the Engineer in accordance with ASTM D3665. Six (6) inch diameter cores shall be extracted for all mixes. The number and location of the cores is specified in 4.06.03-10-2 Density Lots. The Contractor shall coordinate with the Engineer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

After the lift has been compacted and cooled, the Contractor shall cut cores to a depth equal to or greater than the lift thickness and shall remove them without damaging the lift(s) to be tested. 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. The size, shape, and weight of the cores shall not be modified, altered, or manipulated by the Contractor or its representative in any way after extraction from the pavement.

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

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

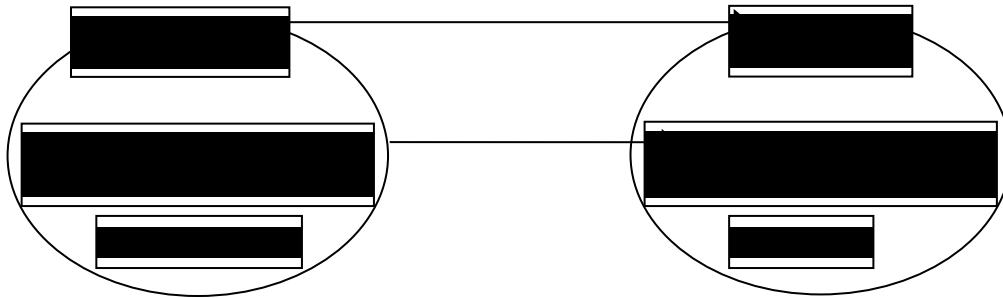
Figure 4.06-4: Notched Wedge Joint Cores (Not to Scale)



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 will 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.

2. Density Lots

a. Simple Average:

A standard simple average density lot **evaluated using the Simple Average method** is the quantity of material placed **in a single lift** within a defined area excluding any bridge decks **less than 3500 tons**. **For total individual mix quantities estimated on the project below 2,000 tons, the lot will include all the material between the curb lines. For total individual mix quantities estimated on the project between 2,000 and 3,500 tons, the lift will be evaluated as two lots each consisting of half of the total tonnage of material placed between the curb lines.**

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

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

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

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

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

b. *PWL Density Lots:*

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

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

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

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

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

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

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

12. Density Dispute Resolution Process: The Contractor and Engineer will work in partnership to avoid potential conflicts and to resolve any differences that may arise during quality control or acceptance testing for density. Both parties will review their sampling and testing procedures and results and share their

findings. If the Contractor disputes the Engineer's test results, the Contractor must submit in writing a request to initiate the Dispute Resolution Process within five calendar days of the notification of the test results. No request for dispute resolution will be allowed unless the Contractor provides quality control results from samples taken prior to and after finish rolling, and within the timeframe described in 4.06.03-8 supporting its position. No request for dispute resolution will be allowed for a density lot in which any core was not taken **in accordance with 4.06.03-10**. Should the dispute not be resolved through evaluation of existing testing data or procedures, the Engineer may authorize the Contractor to obtain a new core or set of core samples per disputed lot. The core samples must be extracted no later than 7 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 4.06.04-2b. 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)) × (Avg. of width measurements (ft))] ÷ 9 s.f./SY

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

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

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

Where: L = Length (ft)

(t) = Actual thickness (inches)

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

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

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

Where: A = 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:

Quantity Adjusted for Weight (T_w) = $GVW - DGW$ = (-) tons

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

2. Bituminous Concrete Adjustment Cost:

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

- i. Non-PWL Production Lot (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:

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

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 4.06.04-1

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

Where: AdjAV_t = Total percent air void adjustment value for the lot

AdjAV_i = Adjustment value from Table 4.06-6 resulting from each sub lot or the average of the adjustment values resulting from multiple tests within a sub lot, as approved by the Engineer.

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

TABLE 4.06-6: Adjustment Values for Air Voids

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

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

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%: $Adj(AV_t \text{ or } PB_t \text{ or } VMA_t) = (55 + 0.5 \text{ PWL}) - 100$
 For PWL at and above 90%: $Adj(AV_t \text{ or } PB_t \text{ or } VMA_t) = (77.5 + 0.25 \text{ PWL}) - 100$
 Where: $AdjAV_t$ = 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] × Tons

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

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

Production Lot Adjustment: T_{SD} × Unit Price = Est. (Pi)

Where: Unit Price = Contract unit price per ton per type of mixture
 Est. (Pi) = Pay Unit in dollars representing incentive or disincentive per lot
 (b) Density Lot Adjustment: An adjustment may be applied to each density lot as follows:

- i. Simple Average Density Lot (less than 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} × 0.50) + (P_{AJ} × 0.50)] / 100] × 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 4.06.04-1

TABLE 4.06-8: Adjustment Values for Pavement Mat density

Average Core Result Percent Mat Density	Percent Adjustment (Bridge and Non-Bridge) ⁽¹⁾⁽²⁾
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 Joint Density	Percent Adjustment (Bridge and Non-Bridge) ⁽¹⁾⁽²⁾
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% is subject to evaluation 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:

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

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

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

$$\text{Tons Adjusted for Joint Density (T}_{JD}) = (PA_J / 100) \times J_Tons$$

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

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

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

Additionally, any subplot with a density result below 87% is subject to evaluation under 1.06.04.

iii. Partial Lots:

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

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

Density Lot Adjustment (Simple Average Lots): $T_D \times \text{Unit Price} = \text{Est. (Di)}$

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

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

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

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

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

Additionally, any subplot with a density result below 87% is subject to evaluation 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:
 1. Tack Coat (gallons at 60°F) = Measured Weight (pounds) / Weight per gallon at 60°F

- 2. Tack Coat (gallons at 60°F) = 0.996 × Measured Weight (pounds) / Weight per gallon at 77°F
- ii. Measured by automated metering system on the delivery vehicle:
Tack Coat (gallons at 60°F) = 0.976 × Measured Volume (gallons).

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

4.06.05—Basis of Payment:

1. HMA S* or PMA S*: The furnishing and placing of 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

After Section 4.06, add the following New Section 4.07:

**SECTION 4.07
RUMBLE STRIPS,
REMOVAL OF RUMBLE STRIPS**

4.07.01—Description

4.07.02—Materials

4.07.03—Construction Methods

4.07.04—Method of Measurement

4.07.05—Basis of Payment

4.07.01—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.

Work under this item shall also consist of removing rumble strips by milling the pavement to a depth of 2 1/4 inches, disposing of pavement millings, sweeping and cleaning, applying tack coat on all surfaces within the milled area, and placing Hot-Mix Asphalt (HMA) or an equivalent Polymer Modified Asphalt (PMA) to match the elevation of the surrounding pavement.

4.07.02—Materials: Materials for the removal of rumble strips shall meet the requirements of Section M.04 and shall consist of the following:

1. HMA S0.375 or an equivalent PMA. All HMA or PMA shall be Traffic Level 2 unless indicated otherwise on the plans.
2. Material for Tack Coat.

4.07.03—Construction Methods:

I. Installation of Rumble Strips:

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 will 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 at the beginning of the operation in order to ensure results that meet the requirements of the Contract to the satisfaction of the Engineer.

Rumble strips shall 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.

- a. **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 inches and shall be a minimum of 16 inches 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(s) shall be on 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 dust. The Contractor shall use a machine capable of creating the finished pattern at a minimum output of 60 rumble strips per minute.
- b. **Manual (Narrow 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 between 3 feet and 4 feet. 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 equipment shall include suitable provisions for the application of water to prevent dust.
- c. **Finished Cut (Automated or Manual):** The rumble strips shall have finished dimensions of 7 inches (+/- 1/2 inch) wide in the direction of travel and shall be 16 inches (+/- 1/2 inch) long measured perpendicular to the direction of travel. The depressions shall have a concave circular shape with a minimum 1/2 inch depth at center (maximum allowable depth is 5/8 inch measured to a valley). The rumble strips shall be placed in relation to the roadway according

to the patterns shown in the plans or in Figure 4.07-1. 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 Article 1.10.03.

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

The Contractor shall provide all traffic control as specified in the item "Maintenance and Protection of Traffic" included elsewhere in the Contract.

II. Removal of Rumble Strips:

Equipment for this work shall include the following:

1. Milling machine: A milling machine designed and built for milling flexible 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 rotary drum of the machine shall use carbide or diamond-tipped tools. A tooth spacing of 8 mm is preferred, but up to 15 mm will be allowed. The forward speed of the milling machine shall be a maximum of 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 milled material from the surface of the roadway and discharge the millings into a truck 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 Contractor may be permitted to use a lesser-equipped milling machine, if approved by the Engineer. It shall be capable of milling a minimum width of 20 inches to completely remove the existing rumble strip. A wider milling width may be used in cases where two rumble strips are located near and parallel to each other, as may occur in a median area.
2. 10-foot straight edge.
3. Sweeper: A sweeper, equipped with a water tank, capable of remove millings and loose debris from the surface. Other sweeping or vacuum type equipment may be provided in lieu of the sweeper where acceptable by the Engineer. A hand broom may be used for smaller areas when approved by the Engineer.
4. Air compressor: An air compressor capable of producing 100 psi oil free compressed air for cleaning the milled pavement surface.
5. Hot air lance: A hot air lance that can deliver 100 psi oil free heated air to clean and dry the pavement surface. The compressed air emitted from the tip of the lance shall achieve a temperature of at least 1500°F.
6. Paving and compaction equipment: Paving and compaction equipment meeting the requirements of Section 4.06. It is expected that much of the placement will require hand work or a mixture of equipment and hand tools to achieve the required results. Smaller compaction equipment, including vibratory plate compactors, will be allowed by the Engineer to achieve the required results. At all times the Contractor is required to meet the density and compaction and all other requirements specified in Sections 4.06 and M.04.
7. Portable lighting equipment: If the work is performed at night a truck-towed light tower and driver shall be provided for use by the Engineer for all marking, installation, and inspection of the patches.
8. Tack Coat Distributor: A minimum 150-gallon capacity tank that is trailer mounted or self-propelled and capable of applying tack coat meeting the requirements of Section 4.06.

The Contractor shall mark the location of the beginning and ending points of the sections for milling and paving, prior to the removal of the rumble strips. The Engineer will review and approve the limits of removal.

The width of milling shall be as specified on the Plans or other specifications. If no other width specification exists, the minimum width of milling for freeway shoulders shall be 20 inches, and for all other rumble strips the minimum width of milling shall be 14 inches in order to completely remove

the existing rumble strip to the satisfaction of the Engineer. If there are two rumble strips located near and parallel to one another, as may occur in median areas, and if they both can be removed by a single pass of a wider milling machine without adversely affecting drainage, safety, or quality of results, then a wider milling machine may be used. In this case the length measured for payment will be the sum of the lengths of the two individual rumble strips. Milling widths wider than specified above may be used with the written permission of the Engineer.

The depth of removal shall be 2 1/4 inches. The Engineer may alter the milling depth, either up or down, based on deterioration or scabbing discovered as work is in progress. This adjustment will not exceed 1/2 inch. It is expected that the milling depth of 2 1/4 inches is appropriate for most cases. The milled surface shall be swept clean (by hand if necessary). Once all millings are removed by sweeping, the milled areas shall be allowed to dry. Any moisture in or on the milled areas must be allowed to evaporate or be removed with the assistance of a hot air lance as specified above. When the milled area is dry to the satisfaction of the Engineer, it shall be blown clean of any residual dust or debris using compressed air.

Once deemed clean and dry by the Engineer, the entire milled area, including the sides/walls of the milled area, shall receive an application of tack coat as specified above and in Section 4.06.

After the tack coat has had sufficient time to cure or break, HMA S0.375 (Traffic Level 2) or an equivalent PMA shall be placed and compacted to the requirements above and in Section 4.06. The Contractor shall confirm that the surface elevation of the finished patch matches the elevation of the surrounding pavement surface to within 1/4 inch using the 10-foot straightedge. The Contractor shall confirm that all patch material placed is uniform in appearance without segregation.

The Contractor shall resurface the milled area prior to opening the roadway to traffic. The milled area shall be swept, cleaned, tacked, and repaved in the same work shift.

Precautions shall be taken to avoid damage to the existing roadway materials that are to remain in place. If damage occurs, it must be repaired by the Contractor at no additional cost to the State. The methods employed in performing the work and all equipment, tools, machinery and plant used in handling material and executing any part of the work shall be subject to the approval of the Engineer before the work is started; and whenever found unsatisfactory, it shall be changed and improved as required by the Engineer.

The Contractor shall remove and dispose of any waste material resulting from the operation in a manner acceptable to the Engineer. This waste material shall be disposed of in accordance with Article 1.10.03.

4.07.04—Method of Measurement: The work for installing and removing rumble strips will be measured for payment by the actual number of linear feet of rumble strips installed or removed, as applicable. Removal 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 previously installed.

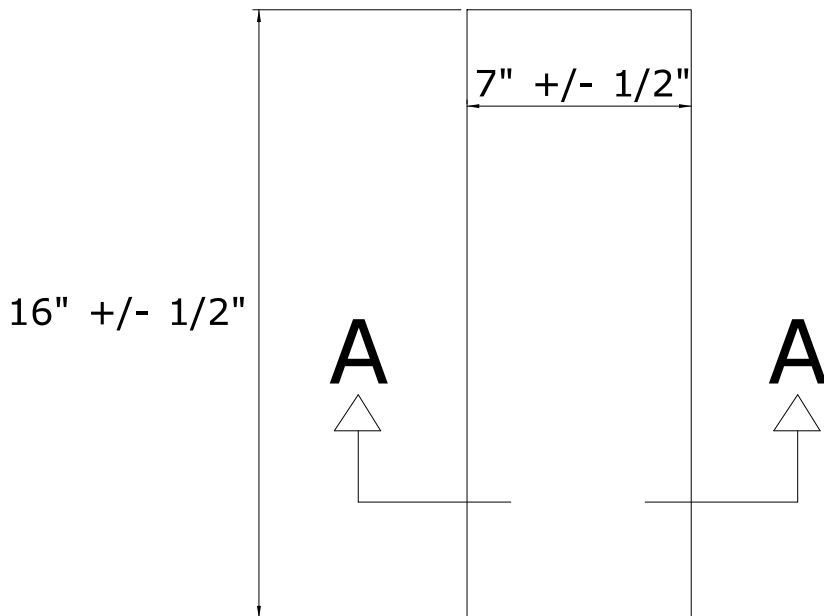
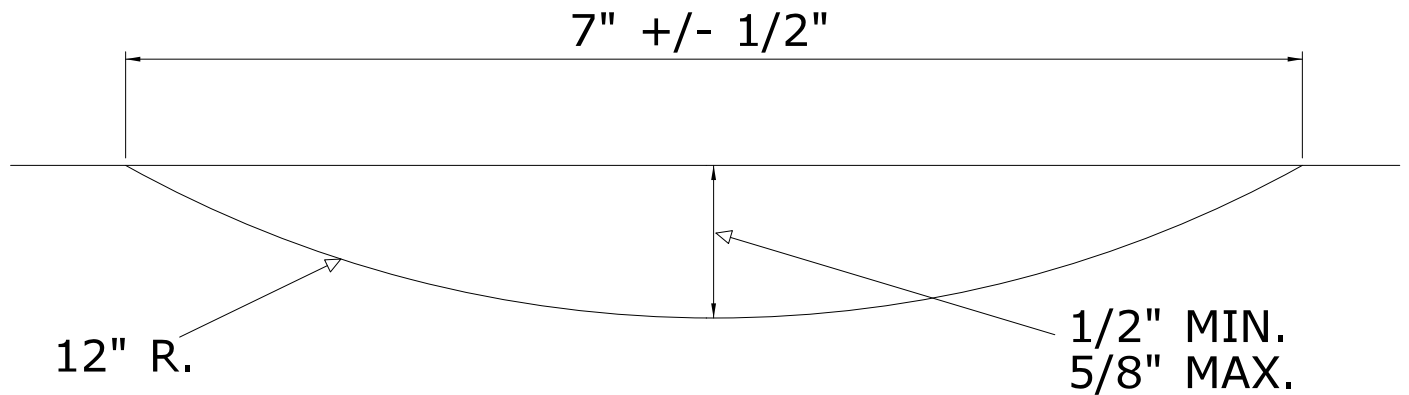
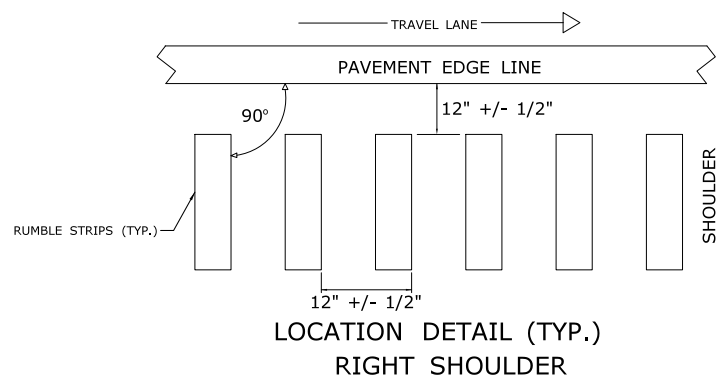
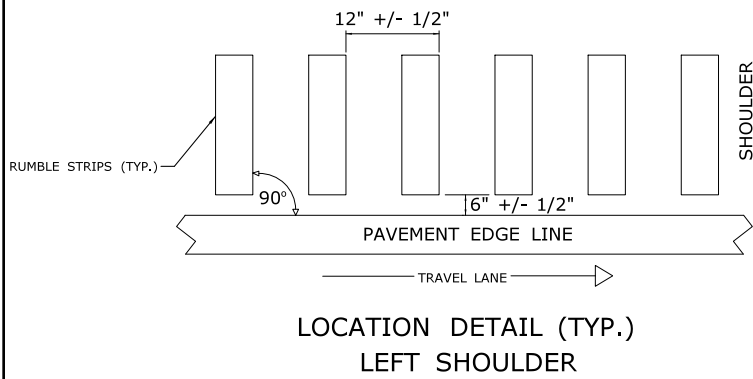
If two rumble strips are near one another and are removed by a single milling machine pass, the length measured for payment will be the sum of the lengths of the two rumble strips.

4.07.05—Basis of Payment: The work for installing rumble strips will be paid for at the Contract unit price per linear 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.

The work for removing rumble strips will be paid for at the Contract unit price per linear foot for "Removal of Rumble Strips." The price shall include the removal of the existing rumble strips by milling, sweeping, cleaning, and drying of the milled area, furnishing all materials, application of tack coat, placement and compaction of the HMA or PMA, and equipment, tools, labor, and work incidental thereto, as well as removal and disposal of any waste material resulting from the operation.

Pay Item	Pay Unit
Rumble Strips–Automated	l.f.
Rumble Strips–Manual	l.f.
Removal of Rumble Strips	l.f.

Figure 4.07-1: DETAILS AND SECTIONS OF RUMBLE STRIPS

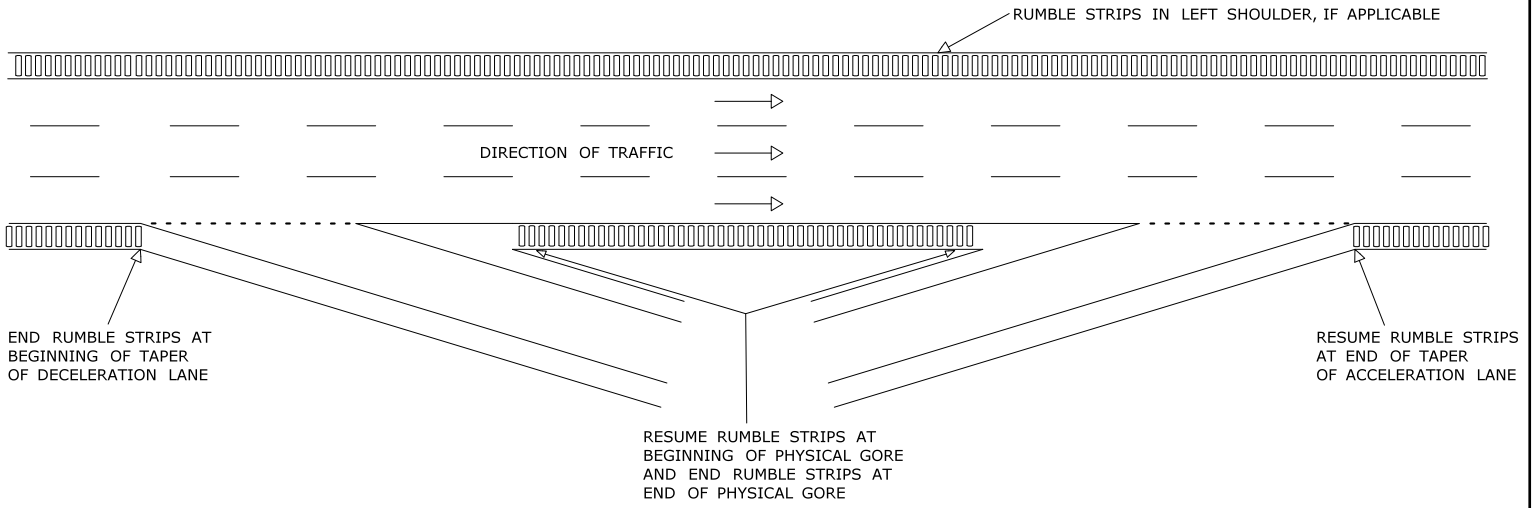


NOTES:

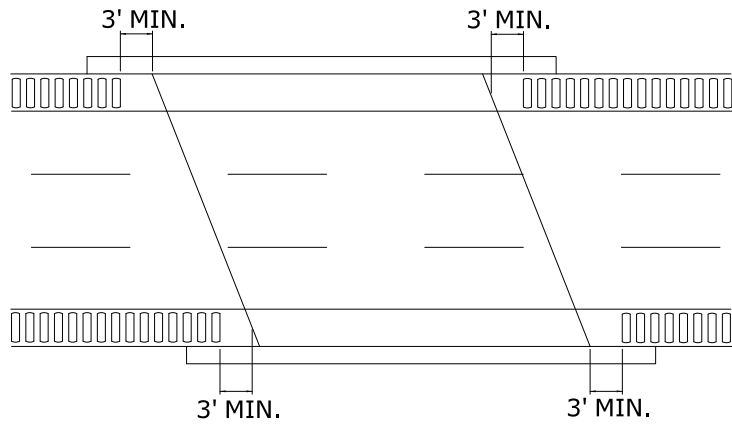
RUMBLE STRIP ALIGNMENT SHALL GENERALLY BE STRAIGHT AND OFFSET APPROXIMATELY 6" IN THE LEFT SHOULDER AND 12" IN THE RIGHT SHOULDER FROM THE OUTER EDGE OF THE EDGE LINE, AND SHALL BE AT LEAST 12" FROM THE LONGITUDINAL JOINT IN COMPOSITE PAVEMENTS. THIS OFFSET MAY BE ADJUSTED TO ACCOMMODATE VARIATIONS IN THE EDGE LINE AND THE SHOULDER WIDTH.

PLAN DETAIL

Figure 4.07-2: TYPICAL TREATMENTS FOR INSTALLING RUMBLE STRIPS

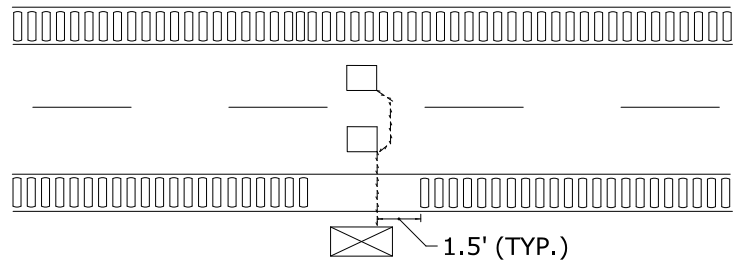


TYPICAL TREATMENT FOR RAMPS

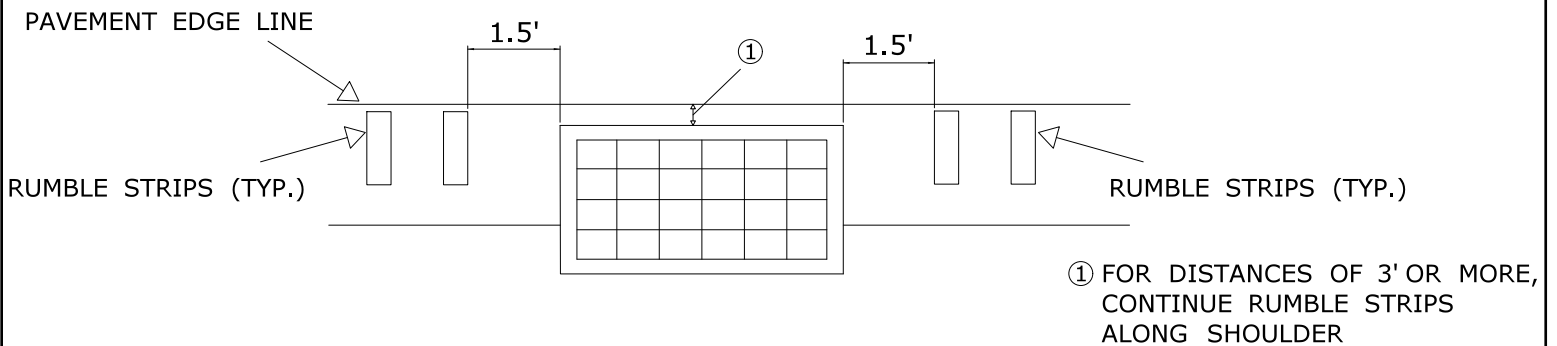


TYPICAL TREATMENT FOR BRIDGES

NOTE: REVISE DISTANCE FROM EXPANSION JOINT AS NEEDED FOR NARROW SHOULDERS APPROACHING BRIDGES



TYPICAL TREATMENT FOR LOOP DETECTOR SAWCUT LOCATIONS



TYPICAL TREATMENT FOR OBSTRUCTIONS (I.E. CATCH BASINS OR MANHOLES)

① FOR DISTANCES OF 3' OR MORE, CONTINUE RUMBLE STRIPS ALONG SHOULDER

**SECTION 4.09
MILLING,
REMOVAL OF EXISTING WEARING SURFACE**

Replace Section 4.09 in its entirety with the following:

**SECTION 4.09
MILLING,
REMOVAL OF EXISTING WEARING SURFACE**

4.09.01—Description: This work shall consist of the milling, removal, and disposal of existing bituminous concrete pavement. It shall also include the complete removal and disposal of the existing bituminous concrete wearing surface, membrane waterproofing and bond breaker covering the reinforced concrete bridge deck(s) as shown on the plans or as ordered by the Engineer. The types of milling shall include the following:

1. **Coarse** Milling shall be used for the removal of bituminous concrete in excess of 4 inch depth.
2. Fine Milling shall be used to remove bituminous concrete from 0 to 4 inches. It may also be used to remove bituminous concrete greater than 4 inches in limited areas or where required.
3. Removal of Existing Wearing Surface shall be used where shown on the plans.

4.09.03—Construction Methods:

A. Milling:

1. General: The Contractor shall remove the bituminous concrete material using the milling type specified on the Plans. 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 14 calendar days unless otherwise stated in the Contract.

2. Equipment: 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, **mobile reference beam** (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 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.

The rotary drum of the milling machine shall have carbide or diamond-tipped teeth with the following maximum spacing and minimum milling depth:

Milling Type	Maximum Tooth Spacing*	Minimum Depth Capability (single pass)
Coarse Milling	15 mm	4 inches
Fine Milling	8 mm	4 inches

* Industry standard **units**

The forward speed of any milling machine shall be limited to no more than 45 feet/minute.

The teeth on the revolving cutting drum must be continually maintained and shall be replaced as warranted to provide a uniform pavement texture, as outlined in 4.09.03-C, Surface Tolerance.

3. Protection: Protection shall be provided around **visible** 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 falls into inlet openings or inlet grates shall be removed at the Contractor's expense.

B. Removal of Existing Wearing Surface: The bituminous concrete wearing surface, membrane waterproofing and bond breaker shall be removed from the structure(s) using means acceptable to the Engineer to completely expose the concrete bridge deck(s).

Prior to removal of bituminous concrete wearing surface, the Contractor shall field verify the depth of the existing bituminous concrete by obtaining depth measurements (maximum 4 inch diameter holes) at intervals no greater than 25 feet apart in each lane. Depth verification holes shall be filled with bituminous material **and compacted** if the removal of wearing surface operation will not be completed within 5 days.

The existing bituminous concrete wearing surface and membrane waterproofing shall be removed in their entireties to the limits shown on the plans. The removal operations shall not begin until the Contractor is prepared to perform the permanent patching or repair to the underlying concrete within 5 working days. If this is in conflict with "Prosecution and Progress," "Maintenance and Protection of Traffic," or other Contract requirements, the more stringent specification shall apply.

Methods for removal of existing wearing surfaces **shall be** fine milling and shall include as many passes or amount of effort required to completely expose the concrete deck(s). Any membrane not completely removed by the milling process shall be removed by scarifying or other means as approved by the Engineer.

Alternate methods for the removal of a bituminous concrete surface may be submitted to the Engineer for review. Demonstration of the alternate removal methods may be required prior to consideration.

The existing bituminous concrete wearing surface, membrane waterproofing, bond breaker, and any other products being removed shall be disposed of offsite by the Contractor unless otherwise noted in the Contract or as directed by the Engineer.

If membrane waterproofing, as specified elsewhere in the Contract, is to be re-installed on the existing deck(s), the surface profile following removal shall be suitable for such reinstallation. The profile of the cleaned concrete surface shall meet the membrane waterproofing manufacturer's recommendations, and have no gouges greater than 1/2 inch in depth. Any deficiencies that could, in the Engineer's opinion, cause failure of, or puncture the new membrane shall be removed as part of this work.

C. Surface Tolerance:

1. General: The 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, poor workmanship, or inadequate field verification. Any unsatisfactory surfaces caused by the removal operations are the Contractor's responsibility and shall be corrected at the Contractor's expense and to the satisfaction of the Engineer prior to opening the surface to traffic.

Any raised structures shall be delineated with traffic control devices, as directed by the Engineer.

2. Tolerances: All milling types shall provide a satisfactory riding surface with a uniform textured appearance. The Contractor shall perform random spot-checks at a minimum of 5 locations per working shift with a Contractor-supplied 10 foot straight edge to verify the surface tolerances listed below. Random spot-checks (minimum of 5 checks per shift) shall occur at a maximum of 250 feet per pass of the milling machine and shall be performed with the Engineer present. The following tolerances shall apply:

(a) **Coarse Milling:** The variation of the top of two ridges from the testing edge of the straightedge, between any two ridge contact points, shall not exceed 3/8 inch. The variation of the top of any ridge to the bottom of the groove adjacent to that ridge shall not exceed 3/8 inch.

(b) **Fine Milling:** The variation of the top of two ridges from the testing edge of the straightedge, between any two ridge contact points, shall not exceed 1/4 inch. The variation of the top of any ridge to the bottom of the groove adjacent to that ridge shall not exceed 1/4 inch.

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 +/- 1/2 inch to eliminate the condition. When removing bituminous concrete pavement entirely from an underlying Portland cement concrete pavement, all 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.

D. Transitions:

1. Construction Joints: No transverse vertical face shall be left exposed to traffic. No longitudinal vertical face greater than 1 inch shall be left exposed to traffic. Any other vertical face created by milling shall have a bituminous concrete taper constructed to the temporary transition requirements as described below.

2. Roadway Structures: Roadway structures shall not have a vertical face of greater than 1 inch exposed to traffic as a result of milling. 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.

All structures within the roadway that are exposed to traffic and greater than 1 inch above the milled surface shall receive a transition meeting the following requirements:

- (a) For roadways with a posted speed limit of 35 mph or less:
- (i) Round structures with an exposed vertical face between 1 inch and 2.5 inches shall be transitioned with a hard rubber tapered protection ring designed for that purpose of the appropriate inside diameter designed specifically to protect roadway structures. Bituminous concrete tapers at a minimum 12 to 1 (12:1) taper in all directions may be substituted for the protection rings if approved by the Engineer.
 - (ii) Round structures with an exposed vertical face greater than 2.5 inches shall receive a transition of bituminous concrete formed at a minimum 12 to 1 (12:1) taper in all directions.
 - (iii) All rectangular structures shall receive a transition of bituminous concrete formed at a minimum 12 to 1 (12:1) taper in all directions.
- (b) For roadways with a posted speed limit of 40, 45 or 50 mph: All structures shall receive a transition of bituminous concrete formed at a minimum 24 to 1 (24:1) taper in all directions of travel. Direction of travel shall include both the leading and trailing sides of a structure. The minimum taper shall be 12 to 1 (12:1) in all other directions.
- (c) For roadways with a posted speed limit of greater than 50 mph: 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 shall include both the leading and trailing sides of a structure. The minimum taper shall be 12 to 1 (12:1) in all other directions.

3. Temporary Transitions: 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 or in accordance with 4.06.03-5, "**Transitions for Roadway Surface.**" If a milling machine is used to form a temporary transition, the length of the temporary transition shall be in accordance with 4.06.03-5, the requirements shown on the plans, or shall be as directed by the Engineer. A clean vertical face shall be established by saw cutting at all final termini limits of the Project.

4. Milling for Permanent Pavement Transitions: When called for on the plans, milling a tapered "keyway" to transition the top course of a bituminous concrete overlay to an existing

pavement shall be performed as specified elsewhere in the Contract.

E. Sweeping: 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 speed that allows for the maximum pickup of millings from the roadway surface. Other sweeping equipment may be provided in lieu of the sweeper 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.

4.09.04—Method of Measurement:

Milling of bituminous concrete will be measured for payment by the number of square yards of area from which the particular type of milling has been completed and the work accepted. Deductions will not be made for minor unmilled areas such as catch basin inlets, manholes, utility boxes and any similar structures.

The removal of wearing surface will be measured for payment by the number of square yards of bituminous concrete wearing surface removed to expose the underlying concrete deck(s). No area deductions will be made for scuppers, joints, and any similar areas.

There will be no measurement for marking roadway structures, transitions for roadway structures and sweeping of any surface that has been milled.

4.09.05—Basis of Payment: Milling work will be paid for at the Contract unit price per square yard for “Fine Milling of Bituminous Concrete (0” to 4”),” “Coarse Milling of Bituminous Concrete (Greater Than 4” Up To 8”),” and “Coarse Milling of Bituminous Concrete (Greater Than 8”).” 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(s).**

Work for the removal of wearing surface will be paid for at the Contract unit price per square yard for “Removal of Existing Wearing Surface,” complete and accepted, which price shall include the field verification, removal of wearing surface, removal of membrane waterproofing and bond breaker, saw cutting, and all equipment, tools and labor. No additional payments will be made for multiple passes with the milling machine(s) to remove the wearing surface.

No separate payments will be made for cleaning the pavement prior to paving; providing protection and doing handwork to remove bituminous concrete around catch basin inlets, bridge scuppers, manholes, utility valve boxes, median barriers, parapets, joints and any similar structures; repairing surface defects as a result of Contractor negligence; providing protection to underground utilities from the vibration of the milling operation; removal of any temporary milled transition; removal and disposal of millings; sweeping and all associated work.

Milling for Pavement Transitions, where identified on the plans, will be paid under a separate item specified elsewhere.

Installation of traffic control devices shall be included under the costs for “Maintenance and Protection of Traffic,” payment for the devices will be under the applicable items.

Pay Item	Pay Unit
Fine Milling of Bituminous Concrete (0” to 4”)	s.y.
Coarse Milling of Bituminous Concrete (Greater Than 4” Up To 8”)	s.y.
Coarse Milling of Bituminous Concrete (Greater Than 8”)	s.y.
Removal of Existing Wearing Surface	s.y.

After Section 5.04, add new Section 5.05 as follows:

**SECTION 5.05
ENDWALL**

5.05.01—Description: This work shall include furnishing and installing concrete endwalls to the dimensions and details shown on the Plans.

5.05.02—Materials: Concrete shall be Class PCC04460 in accordance with the requirements of M.03 for cast-in-place endwalls, or Class PRC04060 in accordance with the requirements of M.14 for precast endwalls.

Reinforcing steel shall meet the requirements of M.06.01.

Grout shall be in accordance with M.03.05.

Pervious Structure Backfill shall meet the requirements of M.02.05.

Granular Fill, if necessary, shall be in accordance with M.02.01.

5.05.03—Construction Methods:

Submittals: The Contractor shall provide fabricator certification with each precast endwall, in accordance with M.08.02-4 “Certification of Precast Concrete Products.”

Excavation: Excavation necessary for endwalls shall be at the location and to the depth shown on the Plans.

Subgrade: The subgrade shall be uniformly compacted true to line and grade for installation of the endwall. If the subgrade is poor as determined by the Engineer, the endwall shall be placed on a 12 inch layer of Granular Fill.

Endwall: Each endwall shall be constructed in the location and to the dimensions and details shown on the plans or as ordered by the Engineer. It shall be neatly and accurately finished, true to the lines and grades shown on the Plans. Pipes shall extend to the exposed face of the endwall, and the end shall be finished with grout. The ends of pipe culverts shall be flush with the endwall as approved by the Engineer.

Pervious Structure Backfill shall be installed as specified in 2.16.03 to the limits as shown on the Plans.

5.05.04—Method of Measurement: This work will be measured for payment by the volume in cubic yards of concrete of all completed and accepted endwalls.

5.05.05—Basis of Payment: This item will be paid for at the Contract unit price per cubic yard for “(Type) Endwall” which shall include furnishing all materials, tools, equipment and labor necessary for the completion of the work. The price shall also include reinforcing steel, excavation, formation of subgrade, pervious structure backfill and grout. If Granular Fill is shown on the plans or ordered by the Engineer, it will be paid for separately.

Pay Item	Pay Unit
(Type) Endwall	c.y.

**SECTION 5.06
RETAINING WALLS, ENDWALLS AND STEPS**

Change the title of Section 5.06 and replace the entire section with the following:

**SECTION 5.06
CONCRETE STEPS**

5.06.01—Description: Work under this section shall include concrete steps and other miscellaneous structures built in the locations indicated or directed, to the lines, grades, dimensions and details shown on the plans.

5.06.02—Materials: The concrete for steps and copings shall be Class PCC03360, meeting the applicable requirements of M.03.

5.06.03—Construction Methods: **Concrete Steps** shall be built where indicated or directed, to the dimensions and details shown on the Plans or as ordered.

5.06.04—Method of Measurement: The quantity of concrete in cubic yards in place and accepted will be measured for payment.

5.06.05—Basis of Payment: Payment will be made at the Contract unit price per cubic yard of “Concrete for Steps and Copings” for the actual quantity of accepted work which shall include all materials, tools, equipment and labor necessary for the completion of the work.

Excavation necessary for the construction of steps will not be measured or paid for separately, but shall be included in the cost of the concrete steps item.

Pay Item	Pay Unit
Concrete for Steps and Copings	c.y.

**SECTION 5.14
PRESTRESSED CONCRETE MEMBERS**

Replace Section 5.14 in its entirety with the following:

**SECTION 5.14
PREFABRICATED CONCRETE STRUCTURAL COMPONENTS**

5.14.01—Description**5.14.02—Materials****5.14.03—Construction Methods**

1. **Submittals**
 - A. **Quality Control Plan**
 - B. **Shop Drawings**
 - C. **Working Drawings**
 - D. **Quality Control Sampling and Testing**
 - E. **Quality Assurance**
 - F. **Assembly Schedule**
2. **Placing Concrete**
3. **Finishing**
4. **Penetrating Sealer Protective Compound**
5. **Marking**
6. **Fabricated Steel Inspection**
7. **Damage**
8. **Additional Requirements for Prestressed Components**
 - A. **Tolerances**
 - B. **Finishing**
 - C. **Joining Deck Units**

5.14.04—Method of Measurement**5.14.05—Basis of Payment**

5.14.01—Description: Work under this item shall consist of furnishing and placing structural components such as precast or prestressed beams, deck units, platforms, foundations, frames, arches, and wingwalls, of the type and size shown on the plans, and all necessary materials and equipment to complete the work.

A Quality Control Plan is required from the fabricator of the precast components.

A detailed Assembly Schedule may be required from the Contractor if noted on the plans.

Dry fit of adjacent components at the precast facility may be required as noted on the plans.

This Section does not apply to standard precast concrete drainage components such as catch basins, manholes or drop inlets as these are covered in Section 5.86 (PC-1 Items).

5.14.02—Materials: All materials shall meet the requirements of M.14.01.

5.14.03—Construction Methods:**1. Submittals:**

A. Quality Control Plan. Facilities producing prefabricated concrete structural components shall have a Quality Control (QC) plan appropriate for the work on file with the Department's Division of Materials Testing. The plan shall include detailed information regarding the personnel and procedures in place to monitor the quality of the work and materials on a daily basis. The plan shall be implemented to the satisfaction of the Contractor and the Engineer.

For work consisting of plainly-reinforced precast components, Certification by the National Precast Concrete Association (NPCA) will be considered but may not relieve the requirement for submittal of a facility-specific Quality Control Plan to the Department.

For work consisting of prestressed components, Certification by the Precast/Prestressed Concrete Institute (PCI) will be considered but may not relieve the requirement for submittal of a facility-specific Quality Control Plan to the Department.

B. Shop Drawings. Before fabrication, the Contractor shall submit **Shop Drawings** to the Engineer for acceptance in accordance with 1.05.02-3.

C. Working Drawings: Prior to installation of the precast components, the Contractor shall submit Working Drawings and supporting computations for the lifting and placement of the components in their final position in accordance with 1.05.02-2. The Contractor shall be solely responsible for the **adequacy** of the drawings and computations, falsework, and other equipment and material necessary to place the components safely and without damage to the components.

The Contractor's responsibility includes the investigation of stresses incurred within the components during placement.

D. Quality Control Sampling and Testing. A schedule for making and testing concrete cylinders from the material used in the casting of each prefabricated concrete component must be included in the QC plan. The cylinders must be cured by the same methods employed for the curing of the component. Results shall be used to verify when 28-day strength requirements have been met, and if applicable, when strength required for transfer of the prestressing load is achieved.

When requested by the Engineer, concrete mix documentation shall be made available for each component cast. The information contained within the documentation shall include the following:

Batching Date and time of day

Batch ID

Load size

Project number

W/C ratio

Batch Quantities and sources

Fine aggregate

Coarse aggregate

Water

Admixtures

Type of and source of cement

E. Quality Assurance: Quality assurance is the prerogative of the Engineer. The Department shall be provided a separate office within the production facility having an area of at least 80 square feet, with the least dimension to be 6 feet. This office shall be maintained at a minimum temperature of 65°F. It shall be clean and provided with a desk and chair and shall be free of extraneous material and equipment. Sufficient light and ventilation shall be provided. During the summer months, the office temperature shall not exceed the ambient air temperature outside the facility.

F. Assembly Schedule: When noted in the Contract, the Contractor shall submit a detailed schedule for the installation of the components that includes cast dates, shipping dates, project-site delivery dates for each component when required. The schedule must account for any time required for proper curing of cast-in-place closure pours or other elements. The schedule shall be revised as needed and approved by the Engineer prior to the initiation of any road closure.

2. Placing Concrete: The Contractor shall provide the Engineer advance notification prior to placement, in accordance with 1.05.10. Concrete may be deposited in the forms after the Contractor or its representative has inspected the condition and adequacy of the forms, location of the prestressing elements, reinforcing steel, and all other embedded components.

The concrete temperature shall be 60°F to 90°F at the time of placement. The use of truck-mixed or ready-mixed concrete from a source not located at the precast facility is prohibited.

Unless otherwise specified on the plans, concrete cover shall be a minimum of 1 1/2 inches and must be maintained for prestressing strands by the use of approved spreaders or by bundling in areas adjacent to openings, cavities, or inserts. Unless otherwise specified, stirrups and ties shall have a minimum cover of 1 inch at these locations. All internal components shall remain in their correct position during concrete placement and vibration.

Interruption in the placement of the concrete resulting in the creation of a cold joint will be cause for rejection. Concrete shall be vibrated sufficiently to produce a surface free from imperfections such as honeycombing, segregation, cracking, or checking. Any deficiencies noted in the components (internal or on the surfaces) may also be cause for rejection.

3. **Finishing:** All fins, runs, or mortar shall be removed from the concrete surfaces which will remain exposed. Form marks on exposed surfaces shall be smoothed by grinding.
4. **Penetrating Sealer Protective Compound:** Concrete surfaces shall be prepared as specified in the Contract. The sealer shall be applied in accordance with the accepted application procedures at the rate specified by the manufacturer, and as described elsewhere in the Contract.
5. **Marking:** Precast Elements shall be identified as to Project, structure, casting date, and position in the structure by means of a non-corrosive tag embedded permanently or stenciled at a visible location on the piece mark end.
6. **Fabricated Steel Inspection:** The provisions of 6.03.03-4 (Shop Fabrication), (a) Notification, shall apply to the steel items, and the pertinent requirements contained therein shall apply equally to the work performed at the facility producing the precast concrete products.
7. **Damage:** Components damaged at any time by improper handling, storing, transporting, or erecting shall be repaired to the satisfaction of the Engineer by the Contractor at its expense.
8. **Additional Requirements for Prestressed Components**
 - A. **Tolerances:** The dimensional tolerance(s) of prestressed components shall be as specified in the PCI "Manual for Quality Control for Plants and the Production of Structural Precast Concrete Products" (MNL116 Latest Edition), unless otherwise specified.
 - B. **Finishing:** Prestressing elements such as strands shall be recessed 1 inch (unless noted otherwise on the plans), and form ties, inserts and lifters shall be recessed 1/4 to 1/2 inch into the component. The recess shall be patched with an approved material. After curing, the patch shall be coated with an approved sealer. Surfaces including projection steel shall not be coated. Additional finishing of component surfaces may be shown on the plans.
 - C. **Joining Deck Units:** Transverse tie strands shall be post tensioned to the total force shown on the plans. When the length of the strand is greater than 13 feet, the Contractor shall verify the tensioning force after 36 hours and the strand shall be re-tensioned if necessary. After verification, the longitudinal shear keys between the adjacent deck units and the recesses shall be thoroughly cleaned and wetted prior to the placement of the non-shrink grout.

If premixed non-shrink grout is used the key areas shall be prepared, and the grout mixed and placed as recommended by the grout manufacturer. Where the top surfaces of the adjacent deck units do not match, grout may be used to form a smooth transition to the satisfaction of the Engineer.

No superimposed dead or live loads shall be applied to the adjacent components until the non-shrink grout in the longitudinal shear keys and recesses has cured sufficiently to prevent any independent movement of a component or cracking of the grout.

5.14.04—Method of Measurement:

1. **Prestressed Beam (Type):** Prestressed Beam (Type) will be measured for payment by the number of linear feet installed and accepted in accordance with the pay limits shown on the plans.
2. **Prestressed Deck Units (Size):** Prestressed Deck Units will be measured for payment by the number of linear feet installed and accepted of the size and at the location indicated on the plans.
3. **Prestressed Approach Slab:** Prestressed Approach Slab will be measured for payment by the number of square yards as shown on the plans.
4. **Precast Concrete Walls:** Precast Concrete Walls will be measured for payment by the number of cubic yards installed as shown on the plans.
5. **Precast Substructure Element (Type):** Precast Substructure Elements (Type) will be measured for payment by the number of cubic yards installed at the location indicated on the plans.
6. **Precast Concrete Three-Sided Rigid Frame:** Precast Concrete Three-Sided Rigid Frame will be measured for payment by the number of linear feet installed as shown on the plans.

5.14.05—Basis of Payment:

1. **Prestressed Beam (Type):** This work will be paid for at the Contract unit price per linear foot for "Prestressed Beam (Type)" complete in place, including all materials, equipment and tools and labor incidental thereto.

- 2. **Prestressed Deck Units (Size):** This work will be paid for at the Contract unit price per linear foot for the size indicated on the plans for “Prestressed Deck Units” complete in place, including all materials, equipment and tools and labor incidental thereto.
- 3. **Prestressed Approach Slab:** This work will be paid for at the Contract unit price per square yard for “Prestressed Approach Slab” complete in place, including all materials, equipment and tools and labor incidental thereto.
- 4. **Precast Concrete Walls:** This work will be paid for at the Contract unit price per cubic yard for “Precast Concrete Walls” complete in place, including all materials, equipment and tools and labor incidental thereto.
- 5. **Precast Substructure Element (Type):** This work will be paid for at the Contract unit price per cubic yard for “Precast Substructure Element (Type)” complete in place, including all materials, equipment and tools and labor incidental thereto.
- 6. **Precast Concrete Three-Sided Rigid Frame:** This work will be paid for at the Contract unit price per linear foot for “Precast Concrete Three-Sided Rigid Frame” complete in place, including all materials, equipment and tools and labor incidental thereto.

Penetrating sealer will be paid separately under the Contract item for Penetrating Sealer Protective Compound.

Pay Item	Pay Unit
Prestressed Beam (Type)	l.f.
Prestressed Deck Units (Size)	l.f.
Precast Approach Slab	s.y.
Precast Concrete Walls	c.y.
Precast Substructure Element (Type)	c.y.
Precast Concrete Three-Sided Rigid Frame	l.f.

**SECTION 6.01
CONCRETE FOR STRUCTURES**

Replace Section 6.01 in its entirety with the following:

**SECTION 6.01
CONCRETE FOR STRUCTURES****6.01.01—Description****6.01.02—Materials****6.01.03—Construction Methods****I. Contractor Quality Control (QC) Requirements for Bridge Deck and Parapet Construction**

1. General
2. Contractor Organization
3. Concrete Mix Design
4. Transportation and Delivery of Concrete
5. Placement and Finishing of Concrete
6. Curing of Concrete
7. Contractor QC testing
8. Quality Control Manager (QCM)
9. Pre-Placement Meeting
10. Submission
11. Test Results/CQCP Changes

II. Requirements for New Construction

1. Falsework and Forms
2. Protection from Environmental Conditions
3. Transportation and Delivery of Concrete
4. Acceptance Testing and Specimens
5. Progression Cylinders and Compressive Strength Specimens
6. Handling and Placing Concrete
7. Finishing Plastic Concrete
8. Bearing Surfaces
9. Curing Concrete
10. Finishing Concrete Surfaces
11. Mortar, Grout, Epoxy and Joint Seal
12. Application of Loads
13. Dispute Resolution

III. Additional Requirements for Surface Repairs and Structural Repairs

1. Work Area Access and Shielding
2. Concrete Removal
3. Surface Preparation
4. Installation of Embedded Galvanic Anodes
5. Welded Wire Fabric in Vertical and Overhead Surface Repairs
6. Formwork
7. Concrete Placement and Curing
8. Form Removal and Sequence of Repair
9. Finishing
10. Sounding of Completed Repairs
11. Sealing Concrete Surfaces

6.01.04—Method of Measurement

1. Concrete used for New Construction
2. Underwater Concrete
3. Concrete used for Surface or Structural Repairs
4. Joint Filler
5. Closed Cell Elastomer

6.01.05—Basis of Payment

1. Concrete
2. Underwater Concrete
3. Concrete Used for Structural Steel Repairs or Surface Repairs
4. Joint Filler
5. Closed Cell Elastomer

6.01.01—Description: This item shall include **cast-in-place (CIP)** 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 **CIP** 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-II-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. The QCM shall be certified as either a **Concrete Transportation Construction Inspector by the American Concrete Institute (ACI)** or a **NETTCP Concrete Inspector**.

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. Requirements for 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, MIL-DTL-24441 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 1.05.17, **Welding**. 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 judgment 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 **delivery** ticket. Delivery tickets must include the following information:
1. State of Connecticut
 2. Name of producer, identification of plant
 3. Date and time of day
 4. Type of material
 5. Cubic yards of material **contained**
 6. Project number, purchase order number, name of Contractor (if other than producer)
 7. Truck **identification** number
 8. **Weights** of individual aggregate, cement, water, and any admixtures
 9. Water/cement ratio, and
 10. Additional water allowance in gallons

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

The Contractor shall notify the Engineer immediately if 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 **but must be** 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 required, additional water may be added by the concrete producer’s quality control staff or representative as a means to temper the concrete. This tempering may only be done after the Engineer and Contractor are notified. The quantity of water in gallons added to the concrete cannot exceed the allowance shown on the delivery ticket. The Contractor is responsible for subsequent testing of the concrete to demonstrate suitable workability has been achieved.

The concrete shall be completely discharged into the forms within 1-1/2 hours from the batch time indicated 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 performed by the producer’s quality control staff or representative. 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	Concrete Temperature
PCC0334Z ¹ (3300 psi)	6.0 +/- 1.5%	See note 3.	60°-90° F
PCC0336Z ¹ (3300 psi)			
PCC0446Z ¹ (4400 psi)			
PCCXXX8Z ¹	7.5 +/- 1.5%		
Modified Standards ²	6.0 +/- 1.5% ²		
Special Provision Mix ⁴	As specified		
¹ “Z” denotes the Exposure Factor 0, 1, 2, or 3 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 Slump must be consistent with the workability required for proper placement of the concrete taking into account the minimum concrete cover and design clearances between surfaces or obstructions within the forms.			
⁴ All concrete mixes with a mix design strength not shown in the table must be reviewed 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 a sampling receptacle, a means of transporting the initial concrete sample from the placement location 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. The distance from the location of concrete placement to the location of testing and initial curing shall be 100 feet or less, unless otherwise allowed 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 Department's laboratory for strength evaluation. The results of this evaluation shall not be used to control stages or progression of the work in the field as further described in 6.01.03-II-5.

- (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 except for 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 or 1.20-1.06.07 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 the 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) Qualified 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 judgment 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 judgment 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 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 **striping** 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 enough 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 article 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.

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 in 6.01.03-II-5, or other means allowed 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 or Surface Resistivity: Contractor QC testing for compressive strength must be performed in accordance with AASHTO T 22 by personnel approved by the Engineer. **Contractor QC testing for Surface Resistivity must be performed in accordance with AASHTO T 358 using 4 × 8 inch cylinders 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 regarding compressive strength or surface resistivity, 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 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, except for 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 x 8-inch cylinders.

Table 6.01.05-2b Permeability Pay Factors (PCCXXXX2 mix classifications only)

Surface Resistivity (kΩ-cm)*	Pay factor (%)
37 or greater	1.1 (110)
29 to 36.9	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 PCCXXXYZ	c.y.
(Thickness and Type) Joint Filler for Bridges	s.f.
(Thickness) Closed Cell Elastomer	c.i.

**SECTION 6.02
REINFORCING STEEL**

Replace Subarticle 6.02.03-4b with the following:

(b) Support Systems: Reinforcing steel shall be supported in its proper position by use of precast mortar blocks, wire bar supports, supplementary bars (tie-down bars), side form spacers or other approved devices. Such devices shall be sufficiently strong and properly placed at frequent intervals so as to maintain the cover between the reinforcing and the surface of the concrete. **When non-galvanized steel forms are proposed to be used adjacent to galvanized reinforcing bars, non-conductive materials shall be used for bar supports, side form spacers and any other device that could electrically connect the reinforcing to the forms. Metal devices must be properly insulated to protect against electrical conduction.**

The reinforcing steel cover shall be no less than that shown on the plans and no greater than that shown plus 1/4 inch.

Platforms for the support of workers and equipment during concrete placement shall be supported directly on the forms and not on the reinforcing steel.

Replace Subarticle 6.02.03-4d with the following:

(d) Wire Supports: Wire bar supports, such as ferrous metal chairs and bolsters, shall conform to industry practice as described in the CRSI "Manual of Standard Practice of the Concrete Reinforcing Steel Institute." All bolsters or chairs which bear against the forms for exposed surfaces shall be equipped with snug fitting, high density, polyethylene tips which provide 1/2-inch minimum clearance between the metal and any exposed surface. For epoxy-coated reinforcement, all wire bar supports and bar clips shall be epoxy or plastic coated. For galvanized reinforcement, chair and bar supports shall be hot-dip galvanized, after fabrication, in accordance with ASTM A123. **Chair and bar supports between galvanized reinforcing and non-galvanized metal forms shall be made of non-conductive materials. Metal devices must be properly insulated to protect against electrical conduction.**

The maximum spacing of slab bolster rows and high chair rows for concrete deck slabs shall be 4 feet unless otherwise directed by the Engineer.

**SECTION 6.03
STRUCTURAL STEEL**

Replace the first paragraph in Article 6.03.01 with the following:

6.03.01—Description: Work under this item shall consist of furnishing, fabricating, inspecting, testing transporting, storing, handling and erecting of both permanent and temporary structural steel of the type and size designated, as shown on the plans or working drawings, as directed by the Engineer and in accordance with these specifications.

Replace Subarticle 6.03.03-3(d) Working Drawings for Falsework and Erection of Structural Steel with the following:

- (d) **Working Drawings for Falsework and Erection of Structural Steel:** Prior to erecting any steel fabricated under this specification, the Contractor shall submit drawings and supporting calculations, including erection stresses, construction loads and wind loads, in accordance with 1.05.02, to the Engineer. The design of temporary supports and falsework shall be as specified in the *AASHTO LRFD Bridge Design Specifications*, the *AASHTO Guide Design Specifications for Bridge Temporary Works*, *AASHTO Guide Specifications for Wind Loads on Bridges During Construction* or any other appropriate standard proposed by the Contractor and found acceptable to the Engineer. Falsework shall be of sufficient rigidity and strength to safely support all loads imposed, including wind, and to produce in the finished structure the lines and grades indicated in the Contract.

The working drawings submittal shall include at a minimum:

1. Title block with Contract number, Project identification number (PIN), town, and structure number and name.
2. Plan of the work area showing support structures, roads, railroad tracks, Federal and State regulated areas as depicted on the plans, utilities or any other information relative to erection.
3. A detailed narrative describing the erection sequence for main members and secondary members (cross frames, diaphragms, lateral bracing, portals, etc.), noting use of holding cranes or temporary supports, falsework, or bents.
4. Delivery location of each girder.
5. Location of each crane for each pick.
6. Capacity chart for each crane and boom length used in the work.
7. The capacity of the crane and of all lifting and connecting devices shall be adequate for the total pick load including spreaders and other materials. In the area of railroads and navigable waterways, the capacity shall be as required by Amtrak, Metro North, U.S. Coast Guard or other regulatory authorities. No picks will be allowed over vehicular or pedestrian traffic unless otherwise noted on the Contract plans. Proposed revisions to Contract pick requirements shall be submitted as an RFC in accordance with 1.05.23 or 1.20-1.05.23 prior to submitting Working Drawings. Picks over vehicular or pedestrian traffic must be noted on the Working Drawings.
8. Pick point location(s) on each member.
9. Lifting weight of each member including clamps, spreader beams, etc.
10. Lift and setting radius for each pick (or maximum lift radius).
11. Description of lifting devices or other connecting equipment.
12. Girder tie-down details or other method of stabilizing erected girders.
13. Bolting requirements, including the minimum number of bolts and erection pins required to stabilize members during the erection sequence.
14. Blocking details for stabilizing members supported on expansion bearings and on bearings that do not limit movement in the transverse direction.
15. The method and location for temporary supports for field spliced or curved girders, including shoring, false work, holding cranes, guys, etc. The Engineer will review, but not approve details of temporary supports. The design, erection, and stability of these supports shall be the sole responsibility of the Contractor.
16. Offsets necessary to adjust expansion bearings during erection to provide for temperature variance and dead load rotation.

The following notes shall be placed on the Erection Drawings:

1. Cranes shall be operated in accordance with the Connecticut Department of Public Safety regulations.
2. The Contractor shall be responsible for verifying the weight of each lift and for insuring the stability of each member during all phases of erection.
3. Members shall be subject to only light drifting to align holes. Any drifting that results in distortion of the member or damage to the holes will be cause for rejection of the member.
4. Field reaming of holes shall not be performed unless required by the Contract drawings or approved by the Engineer.

The Contractor shall submit these documents to the Engineer at least 60 calendar days in advance of their proposed use. If the proposed method of erection requires additional members or modifications to the existing members of the structure, such additions and modifications shall be made by the Contractor at no expense to the State.

Replace Subarticle 6.03.03-4(b) with the following:

- (b) **Camber:** All members shall be cambered prior to heat curving and painting. Rolled beams shall be either heat or cold cambered by methods approved by the Engineer. Cold cambering shall not be performed on fracture critical rolled sections, such as beams spaced more than 12 feet on center. For beams with excessive camber requirements (more than 1 1/2 inches per 20 feet of length), cold cambering is prohibited. Plate girders shall be cambered by cutting the web to the prescribed shape with allowances for shrinkage due to cutting, welding, and heat curving. The fabricator is responsible to determine what allowances should be made. Rolled, plate-rolled, or fabricated sections shall be cambered to the total amount shown on the plans and within the camber deviation tolerances permitted for welded beams and girders, as indicated in the ANSI/AASHTO/AWS D1.5 Bridge Welding Code. The Contractor must submit to the Engineer for approval, a cambering procedure that includes a plan for corrective action if the actual camber is not within tolerance.

Replace Subarticle 6.03.03-4(e) with the following:

- (e) **Inspection:** The Contractor shall furnish facilities for the inspection of material and workmanship in the shop by the Engineer. The Engineer and any representative of the Engineer shall be allowed free access to the necessary parts of the premises.
- The Engineer will provide Quality Assurance (QA) inspection at the fabrication shop to assure that all applicable Quality Control plans and inspections are adequately adhered to and maintained by the Contractor during all phases of the fabrication. A thorough inspection of a random selection of elements at the fabrication shop may serve as the basis of this assurance.
- I. Prior to shipment to the Project, each individual piece of structural steel shall be stamped or marked in a clear and permanent fashion by a representative of the fabricators' Quality Control (QC) Department to indicate complete final inspection by the fabricator and conformance to the Project specifications for that piece. The stamp or mark must be dated. A Materials Certificate in accordance with 1.06.07 or 1.20-1.06.07 may be used in lieu of individual stamps or markings, for all material in a single shipment. The Materials Certificate must list each piece within the shipment and accompany the shipment to the Project Site.
 - II. Following the final inspection by the fabricator's QC personnel, the Engineer may select pieces of structural steel for re-inspection by the Department's QA inspector. Should non-conforming pieces be identified, all similar pieces must be re-inspected by the fabricator and repair procedure(s) submitted to the Engineer for approval. Repairs will be made at the Contractor's expense.
 - III. The pieces selected for re-inspection and found to be in conformance, or adequately repaired pieces, may be stamped or marked by the QA inspector. Such markings indicate the Engineer takes no exception to the pieces being sent to the Project Site. **Such marking does not indicate acceptance or approval of the material by the Engineer.**

Following delivery to the Project Site, the Engineer will perform a visual inspection of all material

to verify shipping documents, fabricator markings, and that there was no damage to the material or coatings during transportation and handling.

The Engineer is not responsible for approving or accepting any fabricated materials prior to final erection and assembly at the Project Site.

Replace the first paragraph of Subarticle 6.03.03-4(f) with the following:

- (f) **Nondestructive Testing:** All nondestructive testing of structural steel and welding shall be performed as designated in the applicable welding code, the plans, and specifications. Such testing shall be performed by personnel approved by the Engineer.

In the fourth paragraph of Subarticle 6.03.03-4(f), Change “Division of Materials Testing” to “Materials Evaluation and Specification Unit (MESU).”

Replace the first paragraph of Subarticle 6.03.03-4(h) with the following:

- (h) **Shipping, Handling, Storage and Receiving:** The Contractor shall make all arrangements necessary to properly load, transport, unload, handle and store all material. The Contractor shall furnish to the Engineer copies of all shipping statements. The weight of the individual members shall be shown on the statements. Members having a weight of more than 3 tons shall have the weight marked thereon. All material shall be unloaded promptly upon delivery. The Contractor shall be responsible for any demurrage charges. Damage to any material during transportation, improper storage, faulty erection, or undocumented fabrication errors may be cause for rejection of said material at the Project Site. Field repairs of damaged or unacceptable coatings will only be allowed if approved by the Engineer.

Replace Subarticle 6.03.03-5(e) with the following:

- (e) **Welded Connections:** Unless otherwise shown on the plans or indicated by the special provisions, welding of structural steel shall be done in accordance with ANSI/AASHTO/AWS D1.5 Bridge Welding Code.
- The Contractor’s welding and inspection procedures for each type of field weld and field tacking must be submitted to the Engineer on the form designated by the Department. All procedures must be approved by the Materials Evaluation and Specification Unit (MESU) prior to any work and must be adhered to at all times.
- Quality control is the responsibility of the Contractor. The Contractor must provide an AWS Certified Welding Inspector (CWI) in accordance with AWS D1.5. The CWI must be qualified and certified in accordance with the provisions of AWS QC1, *Standard for Qualification and Certification of Welding Inspectors*. The CWI shall make visual inspection of all welds and perform magnetic particle inspection, ultrasonic testing inspection, or radiographic testing inspection of field welds in accordance with the applicable welding code, and contract documents. Each test may be witnessed by an authorized representative of the Engineer. Weld inspection report(s) shall be submitted to the Engineer indicating all visual inspections and physical tests have been performed along with the results of each.
- Welds or sections of welds containing imperfections determined to be unacceptable by either the CWI or the Engineer shall be removed and re-welded by the Contractor at their expense. Welds so repaired shall be re-inspected and added to the inspection report(s) by the CWI. All associated costs for such work shall be borne by the Contractor.

Replace the paragraph after 6.03.03-5(f), Inspection with the following:

Quality Control (QC): The Contractor shall review the Project documents with its personnel prior to performing the work. The Contractor shall verify the proper markings, surface conditions and storage of fastener assemblies. The Contractor shall inspect the faying surfaces of connections for compliance with the plans and specifications. The Contractor shall provide to the Engineer a copy of their written QC

report for each shift of the calibration or verification testing specified. This report shall confirm that the selected procedure is properly used and that the fastener assemblies installed meet the tensions specified in Table A. The Contractor shall monitor the installation of fasteners in the work to assure that the selected procedure, as demonstrated in the initial testing to provide the specified tension, is routinely and properly applied.

Replace the last paragraph of Article 6.03.05 with the following:

No direct payment will be made for setting anchor bolts, preparing bearing areas, furnishing and placing materials under bearings. No direct payment will be made for **required** non destructive testing.

Pay Item	Pay Unit
Structural Steel (Site No.)	l.s.
Structural Steel	cwt.

After Section 6.09, add the following New Section 6.10:

**SECTION 6.10
DRILLING HOLES AND BONDING
ANCHORS AND DOWELS**

6.10.01 – Description

6.10.01 – Materials

6.10.01 – Construction Methods

6.10.01 – Method of Measurement

6.10.01 – Basis of Payment

6.10.01 - Description: Work under this item consists of drilling holes in concrete and bonding anchors or dowels into the holes with adhesive bonding material as shown on the plans, in accordance with the manufacturer's recommendations, and as directed by the Engineer.

Adhesive bonded anchors are composed of adhesive bonding material and steel anchors, either fully threaded rods or deformed reinforcing bars, with an embedment no greater than 20 times the diameter of the anchor.

Adhesive bonded dowels are composed of adhesive bonding material and deformed steel reinforcing bars embedded no less than the tension development length of the bar calculated using its full yield strength and no greater than 60 times the diameter of the reinforcing bar.

6.10.02 - Materials: For adhesive bonded anchors, the adhesive bonding material shall meet the assessment requirements of ACI 355.4 latest edition and of ICC Evaluation Service (ICC-ES) AC308 *Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements*, including use under sustained tension loads and installation in holes drilled horizontally. The characteristic bond strength of the adhesive bonding material shall meet or exceed the design characteristic bond stress value specified on the plans.

Steel anchors shall meet the requirements specified on the plans.

For adhesive bonded dowels, the adhesive bonding material shall meet the assessment requirements of ACI 355.4 latest edition and of ICC-ES AC308 *Acceptance Criteria for Post-Installed Adhesive Anchors in Concrete Elements* including use under sustained tension loads, installation in holes drilled horizontally, and for use with reinforcing bars embedded the code-required tension development length of the bar. The characteristic bond strength of the adhesive bonding material shall meet or exceed the design characteristic bond stress value specified on the plans.

Dowels shall meet the requirements specified on the plans.

6.10.03 - Construction Methods: The Contractor shall select adhesive bonding material based on, and compatible with, the Site conditions, the requirements shown on the plans, the material's ICC-ES Evaluation Service Report, and the manufacturer's printed installation instructions (MPII).

A. Submittals: Prior to drilling holes for the anchors and dowels, the Contractor shall submit the following to the Engineer for review in accordance with Article 1.05.02 Product Data requirements:

1. A copy of the ICC-ES Evaluation Service Report for the adhesive bonding material. The ICC-ES Evaluation Service Report shall have been issued or reissued no more than 2 years prior to its submission and be valid at the time of installation.
2. A copy of the adhesive bonding material manufacturer's printed installation instructions (MPII)
3. type of drill and diameter of bit
4. method of cleaning holes
5. method of placement of the adhesive bonding material

B. Installation Requirements: The drilling of the holes for the anchors and dowels shall proceed only after the Contractor's Product Data submittal has been reviewed, stamped and returned to the Contractor and copies have been delivered to the Engineer.

The Contractor shall resubmit the Product Data should the Evaluation Service Report become invalid before the installation of the anchors and dowels as determined by the Engineer.

The installation, including the drilling of the holes, of the anchors and dowels with adhesive bonding material shall be performed by qualified installers. Personnel instructed and trained on the installation of the adhesive bonded anchors and dowels in accordance with the MPII by the adhesive bonding material manufacturer shall be considered qualified installers. The Contractor shall arrange for a manufacturer's

representative to provide onsite installation instruction and training for the Contractor's installation personnel and the Engineer.

Installers of horizontally oriented anchors and dowels subject to sustained tension loads as shown on the plans, shall hold current ACI Adhesive Anchor Installer Certification credentials.

The installation of all anchors and dowels with adhesive bonding material shall be inspected by an inspector, provided by the Contractor, holding current ACI Post-Installed Anchor Inspector Certification credentials. The installation of any horizontally oriented anchors and dowels subject to sustained tension load shall be continuously inspected during installation by the inspector provided by the Contractor, holding current ACI Post-Installed Anchor Inspector Certification credentials.

Prior to drilling holes for the anchors and dowels, the Contractor shall provide the following installer and inspector information to the Engineer:

1. documentation confirming that all the installers are qualified and have been trained by the adhesive bonding material manufacturer
2. a copy of each installer's ACI Adhesive Anchor Installer Certification card, as applicable
3. a copy of the inspector's ACI Post-Installed Anchor Inspector Certification card

The installation, including drilling of holes, of the anchors and dowels with adhesive bonding material shall be in accordance with the adhesive bonding material MPII. The methods and equipment used to drill and clean the holes, weather conditions at the time of installation, temperature of the concrete, anchor and dowel, and the condition of the hole at time of installation shall also be in accordance with the MPII. The use of tools, such as drill bits and cleaning brushes, from a manufacturer different from the manufacturer of the adhesive bonding material is not permitted unless noted otherwise in the adhesive bonding material MPII. In case of conflict between these specifications and the MPII, the requirements of the MPII shall govern.

The anchors and dowels shall be installed in clean, dry holes (no water present) drilled into structurally sound concrete and bonded with adhesive bonding material. Structurally sound concrete is solid when sounded with a hammer, uncracked, greater than 21 days old, and has a compressive strength no less than its design strength when it was originally placed. If the hole is filled with water, partially filled with water, or water entered the hole during drilling, the Contractor shall blow out the water using compressed air and allow a minimum of 24 hours before cleaning the hole and installing the anchors or dowels. The Contractor shall not install anchors or dowels in saturated, surface dry holes (holes with damp surfaces, but no standing water).

Holes for the anchors and dowels shall be located and drilled to a depth no less than the anchor embedment depth 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 as noted on the plans. Core drilling through the reinforcing bars may be allowed if noted on the plans. Drilled holes that are abandoned shall be completely filled with adhesive bonding material or non-shrink grout and finished flush with the adjacent concrete surface.

- C. Field Testing:** After the adhesive bonding material has fully cured in accordance the MPII, the anchors and dowels shall be field tested to verify the installation procedures and installed adhesive anchor strength. Field testing shall be performed by an independent third-party testing agency, hired by the Contractor.

The Contractor shall provide the testing agent with a copy of the plans and these provisions and instruct the testing agent to perform the following:

1. Verify the adhesive bonding material used
2. Check that the anchorage size and type match the requirements of the Contract
3. Perform all field testing in accordance with the Contract
4. Record all test results on a field proof load test report form (sample form included herein)
5. Sign and date the test form

The Contractor shall submit the completed, and signed test report form to the Engineer.

The adhesive bonded anchors and dowels to be field tested at each location shall be randomly selected by the Engineer based on the tabulated number to be tested shown on the plans. A confined static tension test shall be performed in accordance with ACI 355.4 and ASTM E488 for the proof test load shown on the plans, in the presence of the Engineer. The test equipment shall be capable of measuring displacement of the anchor or dowel. The proof test load shall be maintained for a minimum of 10 seconds. In order to pass the field test, the tested anchors and dowels shall have no visible damaged during or after the proof load, no indications of displacement at the proof test load and no cracking of concrete in the vicinity of the anchor

or dowels. An additional anchor or dowel shall be tested for each anchor or dowel that does not pass the field test.

All anchors and dowels that do not pass the field test shall be removed without any damage to surrounding concrete. The Contractor shall reinstall new anchors and dowels in accordance with the requirements described herein. Holes can be re-drilled to remove the adhesive bonding material residue prior to new anchor or dowel installation. The anchors and dowels at the failed locations shall not be reused.

- D. **Repairs:** 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 their expense. The repair work shall be approved in advance and shall be of a quality acceptable to the Engineer.

6.10.04 - Method of Measurement: This work will be measured for payment by the actual number of drilled holes in which anchors and dowels are embedded and accepted.

6.10.05 - Basis of Payment: This work will be paid for at the Contract unit price each for "Drilling Holes and Bonding Anchors" or "Drilling Holes and Bonding Dowels," which price shall include drilling and preparing holes, furnishing and installing adhesive bonding material, furnishing anchors and dowels, providing an ACI Certified inspector, testing of the installed anchors and dowels, and all material, equipment, tools and labor incidental thereto.

Pay Item	Pay Unit
Drilling Holes and Bonding Anchors	ea.
Drilling Holes and Bonding Dowels	ea.

Field Proof Load Test Report

CTDOT Project:		Date:	
Contractor:		Weather:	
Contractor Representative:		Temperature:	AM PM
Independent Testing Firm: <i>(Name/Address)</i>		Technician:	
		Arrival Time:	
		Departure Time:	
Location of Work: (Town/Crossing/Bridge No.)			

Item Details			
Item Tested	Size	Grade	Embedded Depth

Equipment Information			
Hydraulic Ram Number	Hydraulic Ram Capacity	Dial Gauge Number	Dial Gauge Capacity

Test Application Method:	
--------------------------	--

Required Load (lbs):		Required Dial Reading (psi):	
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Test Results								
Test #	Location	Dial Reading (psi)	Max Load (lbs)	Failure Type (None, Bond, Concrete, Component)	Displacement		Pass/Fail	Witnessed By
					Loaded	Unloaded		
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Comments/Sketch (attach additional sheets if applicable)

Large empty rectangular box for comments and sketches.

***REQUIRED - Include sketch of location and details of testing**

Signature:

Date:

SECTION 6.86
DRAINAGE PIPES, DRAINAGE PIPE ENDS

Add the following after the last paragraph of Subarticle 6.86.03-3:

Material placed around pipes shall be deposited on both sides to approximately the same elevation at the same time, in accordance with 2.86.03.

**SECTION 7.07
MEMBRANE WATERPROOFING
(WOVEN GLASS FABRIC)**

Replace Section 7.07 with the following:

**SECTION 7.07
MEMBRANE WATERPROOFING
(WOVEN GLASS FABRIC)**

(Vacant)

**SECTION 7.51
UNDERDRAIN AND OUTLETS**

Replace Section 7.51 in its entire section with the following:

SECTION 7.51

UNDERDRAIN AND OUTLETS FOR UNDERDRAIN

7.51.01—Description: Underdrains shall consist of pipe pervious to water, laid in a trench refilled with pervious material. They shall be of the dimensions and details as indicated on the plans. They shall be classed as "Underdrains," "Foundation Underdrains," "Slope Underdrains" or "Structure Underdrains."

Outlets for underdrains shall consist of pipe laid in a trench and refilled with earth. The size and type of outlet pipe shall be the same as that of the underdrain to which it is connected, except that it shall not be pervious to water. **The outlet pipe may be attached to a precast concrete outlet or a drainage system, where shown on the plans.**

7.51.02—Materials:

(1) **Pipe:** Pipe shall meet the requirements of M.08.01. The kind of pipe to be installed shall be at the option of the Contractor unless a specific type of pipe is indicated on the plans or in the special provisions. **Couplings, fittings, wyes, elbows or tees shall meet the requirements of M.08.01 and shall be compatible with the pipe.**

Underdrain pipe shall be perforated. Outlet pipe shall be solid pipe of the same material and diameter as the underdrain pipe.

(2) **Aggregates:** The aggregates specified for filling the **underdrain** trench shall meet the requirements of M.08.03 **for No. 8 (3/8 inch) stone.**

(3) **Joint Sealants:** The materials for sealing and coupling of joints shall meet the requirements of M.08.01 **for the type of pipe used.**

(4) **Geotextile:** Geotextile shall be as specified in M.08.01-19 Geotextiles.

(5) **Non-Shrink Grout:** Grout used with outlets for underdrain shall meet the requirements of M.03.07.

(6) **Precast Concrete Outlets:** Precast concrete outlets for underdrains shall be as shown on the plans and shall meet the requirements of M.08.02-4. **The outer opening shall be protected by a galvanized grate as shown on the plans.**

7.51.03—Construction Methods: The trench for the underdrain shall be excavated in accordance with the requirements of 2.86.03. The dimensions of the trench shall be as indicated on the plans or as ordered. Where the bottom of the trench is unstable or in rock, the trench shall be excavated 6 inches deeper and an additional 6 inches layer of granular fill or aggregate similar to that used to fill the trench shall be placed and compacted in the trench.

Where the perforations are to be at the bottom of the pipe, the aggregate for filling the trench shall then be placed to a depth of 3 inches and tamped true to grade. The **perforated** pipe shall be placed and firmly bedded on the aggregate. This aggregate shall be placed whether the pipe is encased with geotextile or not.

When the pipe used has a bell, the pipe shall be installed with the bell end up grade with the spigot end entered fully into the adjacent bell.

When concrete pipe is used, the joints will not have to be filled with a joint sealant or fitted with a gasket.

When metal, plastic or polyethylene pipe is used, the pipe shall be carefully butted together and held by bands or other approved means so as to prevent any displacement of the joint.

After the **perforated** pipe has been installed, the aggregate shall be placed around and over the pipe to a height of 12 inches above the top of the pipe. The remainder of the trench shall be filled with aggregate and tamped in layers as shown on the plans. When the underdrain pipe is used with the holes in an upward position, and in all cases where sand is used instead of the aggregate described hereinbefore, a protective 3-inch minimum layer of aggregate shall be placed over the pipe and around all of the holes. Geotextile may be substituted for the 3-inch layer of aggregate. When geotextile is used, the entire length of each drain pipe shall be wrapped with the fabric and the seams lapped and welded or bonded. Where the seams of the geotextile are not welded or bonded, they shall be lapped to a minimum width equal to the diameter of the pipe for 6-inch pipe and larger and a minimum of 6 inches for smaller pipe.

In all cases where subbase material or gravel is to be placed over the underdrains, a layer of at least 6 inches of subbase material or gravel shall be placed over the underdrain immediately after its completion.

For outlets, the trench shall be excavated and the **solid** pipe installed in accordance with the requirements of 2.86.03.

Where shown on the plans or directed by the Engineer, the Contractor shall connect underdrains or outlets for underdrains to a precast concrete outlet, or existing or proposed drainage system.

This work shall be performed in a workmanlike manner satisfactory to the Engineer including installation of tees, elbows or wyes.

Where the upgrade end of the underdrain does not enter a structure, it shall be capped or plugged as directed.

7.51.04—Method of Measurement: This work will be measured for payment by the actual number of linear feet of underdrains, foundation underdrains, slope underdrains, structure underdrains and outlets for underdrains, completed, accepted and measured in place. Measurement shall be continuous through any tees, elbows or wyes. -Trench excavation will not be measured for payment. Rock in drainage trench will be measured for payment in accordance with 2.86.04. Precast concrete outlets for underdrains will be measured for payment by the actual number installed and accepted.

7.51.05—Basis of Payment: This work will be paid for at the Contract unit price per linear foot for "Underdrain," "Foundation Underdrain," "Slope Underdrain," "Structure Underdrain" and "Outlets for Underdrain" complete in place, which price shall include pipe of the size specified, elbows, tees, wyes, couplings, fittings, trench excavation, geotextile, aggregate, sand, tools, material and labor incidental thereto.

The work to furnish and install precast concrete outlet for underdrain will be paid for at the Contract unit price for each size "Precast Concrete Outlet for Underdrain" complete in place, which shall include the precast concrete outlet and all materials and labor incidental thereto.

There will be no direct payment made for capping, plugging or connecting underdrains or outlets to existing or proposed drainage systems or structures, but the cost thereof shall be included in the cost of the underdrain items involved.

Rock in drainage trench will be paid for in accordance with 2.86.05 at the Contract unit price per cubic yard for "Rock in Drainage Trench Excavation" of the applying depth.

Pay Item	Pay Unit
(Size) Underdrain	l.f.
(Size) Foundation Underdrain	l.f.
(Size) Slope Underdrain	l.f.
(Size) Structure Underdrain	l.f.
(Size) Outlet for Underdrain	l.f.
(Size-Type) Underdrain	l.f.
(Size-Type) Foundation Underdrain	l.f.
(Size-Type) Slope Underdrain	l.f.
(Size-Type) Structure Underdrain	l.f.
(Size-Type) Outlet for Underdrain	l.f.
(Size) Precast Concrete Outlet for Underdrain	ea.

SECTION 8.03
PAVED DITCHES, PAVED APRONS AND
PAVED CHANNELS

Replace Section 8.03 in its entirety with the following:

SECTION 8.03
PAVED APRONS

- 8.03.01—Description
- 8.03.02—Materials
- 8.03.03—Construction Methods
- 8.03.04—Method of Measurement
- 8.03.05—Basis of Payment

8.03.01—Description: The work under this item includes placing and compacting of a bituminous concrete course on a pre-excavated foundation forming paved aprons in accordance with the line, grade, compacted final thickness and typical cross-section shown on the plans.

8.03.02—Materials: The materials for this work shall meet the following requirements:
Bituminous Concrete Curb Mix shall meet the requirements of 4.06 and M.04.01.
Processed Aggregate Base shall meet the requirements of M.05.01.

8.03.03—Construction Methods: The processed aggregate base course shall be placed in a single course, 4 inches compacted thickness, in accordance with 3.04.03. The surface shall be a 2 inch course of bituminous concrete curb mix. The bituminous concrete shall be placed and thoroughly compacted with compaction equipment suitable for small areas.

8.03.04—Method of Measurement: The quantity to be measured for this item will be the surface area in square yards of paved apron constructed and accepted.
Formation of Subgrade and Processed Aggregate Base will not be measured for payment.

8.03.05—Basis of Payment: This work will be paid for at the Contract unit price per square yard for "Paved Apron." The price shall include all materials, tools, equipment and work incidental thereto.

Pay Item	Pay Unit
Paved Apron	s.y.

**SECTION 8.18
PROTECTIVE COMPOUND FOR BRIDGES**

Delete Section 8.18 in its entirety.

**SECTION 8.21
PRECAST CONCRETE BARRIER CURB**

8.21.01—Description: Under this item, the Contractor shall furnish and install precast concrete barrier curb in the locations shown on the plans, or as directed by the Engineer.

8.21.02—Materials:

1. Concrete shall be Class PRC04060 meeting the requirements of M.14.01.
2. The manufacturer identification and casting date shall be permanently marked on the barrier curb by means of a non-corrosive metal or plastic tag as approved by the Engineer and in the location as shown on the plan.
3. Reinforcing steel shall be galvanized and shall meet the requirements of M.06.01.
4. Lifting hooks, keys, threaded inserts, 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. Dowels shall be galvanized and shall meet the requirements of ASTM A36.
6. Galvanizing shall meet the requirements of ASTM A123.
7. Penetrating Sealer Protective Compound shall meet the requirements of M.03.09.
8. Precast concrete barrier curb shall be accepted on the basis of manufacturer's certification, as defined in M.08.02-4.

8.21.03—Construction Methods:

1. Precast Units: Concrete barrier units shall be precast in an approved plant in accordance with the applicable requirements of 5.14.03-2, 3, 5 and 7 supplemented as follows:
Forms for precast concrete barrier units shall be of substantial construction, lined so as to produce a smooth dense surface with a uniform appearance. Form oil shall be a non-staining type. Air holes on exposed surfaces shall be filled immediately after removal of the forms to the satisfaction of the Engineer.
2. The precast units shall be placed on a prepared subbase and shall be installed to the lines and grades given and in accordance with the dimensions and details shown on the plans so as to produce a smooth continuous barrier curb.
Special transition units, as required, may be cast in place in accordance with 6.01.03.
3. Backfilling: The backfilling shall be completed to the lines shown on the plans, or as ordered, by filling to the required elevation with approved material which shall be placed in layers of not over 6 inches deep with each layer compacted until firm and solid.
4. Whenever concrete barrier is being constructed adjacent to areas open to traffic, the Contractor shall complete the installation to and including the designed terminal treatment at the close of each day's work so as to prevent any hazard that would be caused by leaving an exposed end.
On long runs or other locations where it is not practical to complete the installation to and including the designed terminal treatment, the Contractor shall install and maintain temporary protection by methods such as impact attenuating devices for terminating the barrier so as to minimize any hazard.
The Contractor shall submit to the Engineer for approval details of proposed methods for the temporary terminal treatment of the end section.
5. Precast units shall meet the 28 day strength requirements before shipping. Precast units that have been damaged shall be removed from the Project at the Contractor's expense. Each line of barrier shall be uniform in color.
6. Precast units shall be coated with a penetrating sealer protective compound that meets the requirements of M.03.09.
7. Where called for, a cast-in-place concrete cap shall be installed above granular fill placed between a double row of concrete barrier curb, as shown on the plans.

8.21.04—Method of Measurement: This work will be measured for payment along the centerline of the top of the concrete barrier and will be the actual number of linear feet of the shape and size of concrete barrier installed and accepted.

8.21.05—Basis of Payment: This work will be paid for at the Contract unit price per linear foot for "Precast Concrete Barrier Curb," of the shape and size specified, complete in place, which price shall include all backfill, sand backfill, joint seal, materials, reinforcing steel, dowels, penetrating sealer protective compound, transportation, equipment, tools and labor incidental thereto.

When shown on the plans, backfill placed between a double row of concrete barrier curb shall be paid for under the item "Granular Fill." The concrete cap, welded wire fabric, 1/2 inch preformed joint filler and joint seal shall be paid for under the item "Class PCC03340."

Pay Item	Pay Unit
(Shape) Precast Concrete Barrier Curb (Size)	l.f.

**SECTION 8.22
TEMPORARY TRAFFIC BARRIER**

Replace Section 8.22 in its entirety with the following:

**SECTION 8.22
TEMPORARY TRAFFIC BARRIER**

8.22.01—Description**8.22.02—Materials****8.22.03—Construction Methods****8.22.04—Method of Measurement****8.22.05—Basis of Payment**

8.22.01—Description: Work under this item shall consist of furnishing, installing, relocating and removing temporary traffic barrier.

8.22.02—Materials: The precast concrete materials for temporary traffic barrier shall meet the requirements of Article 8.21.02 except that reinforcing steel does not need to be galvanized.

The delineator shall be fabricated of aluminum, steel, plastic, or of a material approved by the Engineer. The retroreflective sheeting shall be Type IV, Type V, or Type IX as specified in Article M.18.09. Delineator fastening hardware or adhesive shall be suitable for the purpose intended.

The connection rod and anchors shall be manufactured in accordance with AASHTO M 314, Grade 55. Threads shall be UNC Series as specified in ANSI B1.1 and shall have Class 2A threaded tolerances before galvanizing.

Plain steel washers shall be manufactured in accordance with ANSI B18.22.

Heavy hex nuts shall be Grade A, manufactured in accordance with AASHTO M 291.

Connection loop bars shall be bent from smooth bars that meet the requirements of ASTM A36.

Steel tube for the connection key shall meet the requirements of ASTM A500, Grade B or C, and shall be hot dip galvanized in accordance with ASTM A123.

Steel plate shall be AASHTO M270 Grade 36 or 50, and shall be hot dip galvanized in accordance with ASTM A123.

Adhesive bonding material shall meet the requirements of Article 6.10.02.

Non-shrink, non-staining grout shall meet the requirements of Article M.03.05.

Membrane waterproofing (cold liquid elastomeric) shall be selected from the Qualified Products List and shall be able to be applied by brush.

8.22.03—Construction Methods:**1. Submittals:**

- a. When used temporary traffic barrier is furnished, the Contractor shall provide documentation in accordance with 1.06.02 demonstrating compliance with the Contract requirements.

Any temporary precast concrete barrier curb that was fabricated after March 24, 2021, that does not, at a minimum, meet AASHTO MASH (TL-3) is not allowed to be used as temporary traffic barrier. The condition of all precast concrete temporary traffic barrier must meet the “acceptable” or “marginal” definitions in the ATSSA [“Quality Guidelines for Temporary Traffic Control Devices and Features.”](#)
- b. When an alternative temporary traffic barrier is requested, the Contractor shall submit to the Engineer a Materials Certificate, in accordance with Article 1.06.07, and a copy of the Federal-aid eligibility letter issued to the manufacturer documenting that the device complies with the minimum requirements of MASH (TL-3) and does not exceed the deflection distance indicated on the plans for the type of temporary traffic barrier proposed.
- c. Submit Materials Certificates for the steel plate, connection rods, anchors and non-shrink, non-staining grout.
- d. A Materials Certificate for the membrane waterproofing (cold liquid elastomeric) shall be submitted to the Engineer, in accordance with Article 1.06.07, along with the manufacturer’s written installation instructions for application of the membrane when repair of deck membrane is required after removal of anchors.
- e. Submit Product Data for the selected adhesive bonding material, in accordance with Article

6.10.03-A.

2. **Precast Unit:** Concrete temporary traffic barrier units shall be precast in accordance with the pertinent requirements of Article 8.21.03, except the penetrating sealer protective compound need not be applied to the precast unit.

3. **Installation & Removal:** Temporary traffic barrier units shall be placed as shown on the plans or as directed by the Engineer, on a firm even surface to produce a smooth continuous length of barrier.

Any damaged material shall be removed and replaced by the Contractor at their expense. The Contractor shall maintain the condition and alignment of the temporary traffic barrier during all stages of construction.

The Contractor shall relocate the temporary traffic barrier and its appurtenances to locations within the Project limits when shown on the plans or as ordered by the Engineer. When the temporary traffic barrier is no longer required, it shall be removed completely from the Project and shall remain the property of the Contractor.

Any holes in concrete decks created for anchoring shall be filled with non-shrink, non-staining grout up to the concrete surface after barrier removal. Anchors secured to the deck using adhesive bonding material shall be cut flush with the concrete surface when no longer needed. If the temporary traffic barrier is set on a bituminous wearing surface on top of the concrete deck and the existing membrane is to remain, a six-inch diameter pavement core shall be drilled around each anchor to the top of deck to remove the wearing surface and to provide access to cut off the anchor or fill the hole in the deck. All loose or poorly adhering membrane and other materials that could adversely affect the bond of the membrane to the deck shall be removed from the concrete surface. Cold liquid elastomeric membrane shall be brush-applied to the exposed concrete surface in accordance with the accepted installation instructions submitted by the manufacturer. The minimum thickness of membrane shall be 80 mils which shall be measured using a wet film gage. After the membrane is cured in accordance with the manufacturer's written recommendations, 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.

4. **Delineator:** The delineator shall be installed in the center on top of all barriers on the roadway and those installed within 8 feet from the edge of road, and at the locations designated on the plans. They shall be fastened by adhesive or hardware and must be maintained in good condition at all times. The color of the delineator shall match the color of the adjacent pavement marking edge line.

DE-7 (One Way White) delineators shall be used when the barriers are on the right side of traffic or dividing traffic in the same direction.

DE-7A (One Way Yellow) delineators shall be used when the barriers are on the left side of traffic.

DE-7B (Two Way Yellow) delineators shall be used when the barriers divide opposing traffic lanes.

DE-7D (Two Way White) delineators shall be used when the barriers are installed in an alternating one-way traffic operation.

Spacing of delineators on temporary traffic barriers shall be as specified on Traffic Standard Sheet TR-1205_01.

5. **Connection:** Nuts for the connection rod pin and loop connection shall be turned until the washer is drawn up against the connection loop. The connection loops must not be bent in the tightening process. For ease in removing the nuts, the threads may be waxed. Connection keys shall be installed as shown on the Plans

6. **Anchoring:** Anchoring temporary traffic barrier shall be with adhesive bonding material, thru-bolting, or pinning as shown on the plans, except only threaded inserts shall be used on new prestressed concrete members and shall be cast into the deck in locations that accommodate the stage construction. Shop drawings for the new prestressed concrete members shall reflect the use of inserts. Drilling into prestressed concrete members is not permitted. Installation of anchors with adhesive bonding material shall be in accordance with Article 6.10.03.

The terminal units of temporary barrier curb shall be 20 feet in length and shall be anchored with pins on both sides as shown on the plans.

8.22.04—Method of Measurement: This work will be measured for payment along the centerline of the top of the temporary traffic barrier and will be the actual number of linear feet of temporary traffic barrier

furnished, installed and accepted. Relocated temporary traffic barrier will be measured along the centerline of the top of the barrier each time the barrier has been satisfactorily relocated as directed by the Engineer, including to and from the storage area. Storage of barrier will not be measured for payment. Relocation of temporary traffic barrier for access to the work area, or for the convenience of the Contractor, shall be considered incidental to Maintenance and Protection of Traffic and will not be measured for payment.

The terminal units will not be measured separately. Their length will be included in the length of temporary traffic barrier installed.

Delineators will not be measured for payment.

Anchoring materials, filling of holes, cutting off adhesive bonded anchors, coring, furnishing and applying waterproofing membrane and filling in core holes with bituminous concrete will not be measured for payment.

8.22.05— Basis of Payment: This work will be paid for at the Contract unit price per linear foot for "Temporary Traffic Barrier" or "Temporary Traffic Barrier (Type)," complete in place, which price shall include all furnishing, transportation, initial installation, final removal, storage, materials, reinforcing steel, connecting rods, anchoring materials, equipment, tools and labor incidental thereto. Each temporary traffic barrier will be paid for once regardless of the number of times it is used on the Project. Any temporary traffic barrier that become lost, damaged or defaced shall be replaced by the Contractor at no cost to the State.

The relocation of the temporary traffic barrier will be paid for at the Contract unit price per linear foot for "Relocated Temporary Traffic Barrier" or "Relocated Temporary Traffic Barrier (Type)," which price shall include all transportation, installation, removal, materials, equipment, tools, storage and labor incidental thereto.

Pay Item	Pay Unit
Temporary Traffic Barrier	l.f.
Temporary Traffic Barrier (Pinned)	l.f.
Temporary Traffic Barrier (Bolted)	l.f.
Relocated Temporary Traffic Barrier	l.f.
Relocated Temporary Traffic Barrier (Pinned)	l.f.
Relocated Temporary Traffic Barrier (Bolted)	l.f.

**SECTION 9.10
METAL BEAM RAIL**

Replace Subarticle 9.10.02-1 with the following:

1. **Adhesive bonding** material shall meet the requirements of 6.10.02.

Add the following after the eighth paragraph of Article 9.10.03:

Rail attachment to concrete bridge parapets, barriers, or other fixed objects shall be made using through bolts as shown on the plans. When anchor bolts for rail attachments are shown on the plans to be installed into existing concrete, drilling and bonding shall be as specified in Article 6.10.03. A minimum of 3 anchors, or 5% of the total number of anchors, whichever is greater, shall be tested in accordance with 6.10.03-C.

Replace Subarticle 9.10.04-3 with the following:

3. (Type) Attachment: The number of rail attachments to bridge parapets, barriers or other fixed objects measured for payment will be the actual number of accepted attachments of each type or designation installed in accordance with the "Pay Limit for Attachment" shown on the plans. **Anchoring materials, and testing and inspection as specified in 6.10.03 will not be measured for payment.**

Replace Subarticle 9.10.05-3 with the following:

3. (Type) Attachment: This work will be paid for at the Contract unit price for each type of attachment furnished and installed. The price shall include all materials, drilling for attachment to concrete, either preset anchor bolts, pipe sleeves and through bolts, or anchor bolts to be bonded into drilled holes, removal and disposal of surplus material, equipment, tools, and labor incidental to the installation of the attachment.

**SECTION 9.21
CONCRETE SIDEWALKS AND RAMPS**

Replace Section 9.21 in its entirety with the following:

**SECTION 9.21
CONCRETE SIDEWALKS AND RAMPS**

9.21.01—Description: This item shall consist of concrete sidewalks and ramps constructed on a granular fill or reclaimed miscellaneous aggregate base course in the locations and to the dimensions and details shown on the plans or as ordered.

9.21.02—Materials: Materials for this work shall meet the requirements of M.03. Concrete shall have a minimum compressive strength of 4,400 psi. Liquid membrane-forming curing compound shall be as specified in M.03.04-3.

Granular fill or reclaimed miscellaneous aggregate for base shall be as specified in M.02.01.

Detectable warning [surfaces](#) shall be prefabricated detectable warning tile chosen from the Department's [Qualified Products List](#) for retrofit or cast in place applications.

9.21.03—Construction Methods:

1. Excavation: Excavation, including removal of any existing sidewalk (bituminous or concrete) and curbing, shall be made to the required depths below the finished grade, as shown on the plans or as directed. All soft and yielding material shall be removed and replaced with suitable material.

When connecting new concrete sidewalk to a section of existing concrete sidewalk, the connection point shall be at the nearest joint in the existing sidewalk.

The Contractor shall establish the limits required to achieve grades for each ramp prior to removal of existing sidewalk and ramps. The Contractor shall document and notify the Engineer of any control points that may conflict with the design grades or configuration of ramps shown on the plans. Control points can be but are not limited to ROW, utility poles, drainage structures, buildings, fences, walls or other features found near the proposed ramp. When control points are encountered within the limits of the ramp, the Engineer will determine if an alternative ramp type is required or the ramp is to be constructed as shown on the plans.

2. Granular Fill or Reclaimed Miscellaneous Aggregate Base: The granular fill or reclaimed miscellaneous aggregate base shall be placed in layers not to exceed 6 inches deep and to such a depth that after compaction it shall be at the specified depth below the finished grade of the walk. The base shall be wetted and rolled or tamped after the spreading of each layer.

3. Forms: Forms shall be of metal or wood, straight, free from warp and of sufficient strength to resist springing from the pressure of the concrete. If made of wood, they shall be of 2 inch surfaced plank except that at sharp curves thinner material may be used. If made of metal, they shall be of approved section and shall have a flat surface on the top. Forms shall be of a depth equal to the depth of the sidewalk. Forms shall be securely staked, braced and held firmly to the required line and grade and shall be sufficiently tight to prevent leakage of mortar. All forms shall be cleaned and oiled or wetted before concrete is placed against them. Sheet metal templates 1/8 inch thick, of the full depth and width of the walk, shall be spaced at intervals of 12 feet or as directed. If the concrete is placed in alternate sections, these templates shall remain in place until concrete has been placed on both sides of the template. As soon as the concrete has obtained its initial set, the templates shall be removed.

4. Discontinuities: Vertical surface discontinuities shall be 1/2 inch maximum. Vertical surface discontinuities between 1/4 inch and 1/2 inch shall be beveled with a slope not steeper than 50%. The bevel shall be applied across the entire vertical surface discontinuity.

5. Concrete: The concrete shall be proportioned, mixed, placed, etc., in accordance with the provisions of 6.01.03, except as modified herein.

6. Finishing: The surface of the concrete shall be finished with a wood float or by other approved means. The outside edges of the slab and all joints shall be edged with a 1/4 inch radius edging tool. Each slab shall be divided into 2 or more sections by forming dummy joints with a jointing tool as directed.

7. Curing: Liquid membrane-forming compound shall be applied following finishing as recommended by the manufacturer.

The Contractor shall have on the Project sufficient approved cover sheet of cotton mats for the protection of the sidewalk in case of rain or breakdown of the spray equipment. The cotton mats shall be maintained in a wet condition during the period of use, as specified in [6.01.03-II-9](#).

8. Backfilling and Removal of Surplus Material: The sides of the sidewalk shall be backfilled with suitable material thoroughly compacted and finished flush with the top of the sidewalk. All surplus material shall be removed and the Site left in a neat and presentable condition to the satisfaction of the Engineer.

9. Detectable Warning Surface: The detectable warning surface for new construction shall be set directly in plastic concrete and each tile shall be weighed down to prevent the tile from floating after placement in wet concrete in accordance with curing procedures. Install detectable warning surface according to the plans and the manufacturer’s requirements, or as directed by the Engineer.

The detectable warning surface for retrofit construction shall be installed according to the plans in the direction of pedestrian route and contained wholly within painted crosswalk when present. Its installation shall meet all manufacturer’s requirements.

9.21.04—Method of Measurement: This work will be measured for payment as follows:

1. Concrete Sidewalk or Ramp: This work will be measured by the actual number of square feet of completed and accepted concrete sidewalk or ramp. Liquid membrane-forming curing compound will not be measured for payment.

2. Excavation: Excavation below the finished grade of the sidewalk or ramp, backfilling, and disposal of surplus material will not be measured for payment, but the cost shall be included in the price bid for the sidewalk or ramp. Excavation above the finished grade of the sidewalk or ramp will be measured and paid for in accordance with 2.02.

3. Granular Fill or Reclaimed Miscellaneous Aggregate Base: This work will not be measured for payment, but the cost shall be considered as included in the price bid for the sidewalk or ramp.

4. Detectable Warning Surface: For new construction (cast in place), the detectable warning surface will be measured for payment by the actual number of square feet of detectable warning surface installed and accepted.

5. Retrofit Detectable Warning Strip: For retrofit construction (surface applied), the detectable warning strip will be measured for payment by the actual number of each ramp where a detectable warning strip has been installed and accepted regardless of the number of tiles installed.

6. Construction Surveying: The establishment of control points and limits of grading will be measured in accordance with the item “Construction Surveying.”

9.21.05—Basis of Payment: Construction of a concrete sidewalk or ramp will be paid for at the Contract unit price per square foot for "Concrete Sidewalk" or "Concrete Sidewalk Ramp" complete and accepted in place, which price shall include all excavation as specified above, backfill, disposal of surplus material, curb removal and any monolithic or separately cast sidewalk curb when required for the sidewalk ramp as shown on the plans, granular fill or reclaimed miscellaneous aggregate base, curing compound, equipment, tools, materials and labor incidental thereto.

A new detectable warning surface will be paid for at the Contract unit price per square foot of “Detectable Warning Surface” installed and complete in place. This price shall include all tiles, materials, equipment, tools and labor incidental thereto.

Retrofitting the existing concrete sidewalk with a detectable warning strip will be paid for at the Contract unit price for “Retrofit Detectable Warning Strip” at each ramp where the retrofit detectable warning strip has been installed complete in place. This price will include all tiles, saw cutting concrete, adhesive, drilling holes for fasteners, materials, equipment, tools and labor incidental thereto.

The establishment of control points and limits of grading will be paid for in accordance with the item “Construction Staking.”

Pay Item	Pay Unit
Concrete Sidewalk	s.f.
Concrete Sidewalk Ramp	s.f.
Detectable Warning Surface	s.f.
Retrofit Detectable Warning Strip	ea.

**SECTION 9.24
CONCRETE DRIVEWAY RAMP**

Replace Section 9.24 in its entirety with the following:

**SECTION 9.24
CONCRETE DRIVEWAY RAMP**

9.24.01—Description: This item shall consist of concrete driveway ramps constructed on a granular fill base in accordance with the Contract.

9.24.02—Materials: Materials for this work shall meet the following requirements:

- 1. **Portland Cement:** Concrete shall meet the requirements of M.03 for Class PCC03340 Concrete.
- 2. **Granular Fill Base:** Granular fill shall meet the requirements of M.02.01.
- 3. **Reinforcement:** Shall meet the requirements of M.06.01.

9.24.03—Construction Methods: Construction methods shall meet the requirements of 9.21.03. The surface shall be finished and marked off as directed by the Engineer.

The Contractor shall protect the driveway ramp from damage until it is opened to traffic. The ramp shall not be opened to traffic until the attainment of a compressive strength of 3,000 psi. Any damage occurring prior to the Department opening the driveway ramp to traffic shall be repaired or replaced at the Contractor's expense.

9.24.04—Method of Measurement: This work will be measured for payment as follows:

- 1. **Concrete Driveway Ramp:** This work will be measured for payment by the actual number of cubic yards of completed and accepted concrete driveway ramps.
- 2. **Excavation:** Excavation below the finished grade of each ramp, backfilling and disposal of surplus material will not be measured for payment; but the cost shall be included in the Contract price for Concrete Driveway Ramp.

Excavation above the finished grade of each ramp will be classified and paid for in accordance with 2.02.

- 3. **Granular Fill Base:** This work will not be measured for payment, but the cost shall be included in the Contract price for Concrete Driveway Ramp.
- 4. **Reinforcement:** This material will not be measured for payment, but the cost shall be included in the Contract price for Concrete Driveway Ramp.

9.24.05—Basis of Payment: This work will be paid for at the Contract unit price per cubic yard for "Concrete Driveway Ramp," complete in place, which price shall include all excavation as specified above, backfill, disposal of surplus materials, and all materials, equipment, tools and labor incidental thereto.

Pay Item	Pay Unit
Concrete Driveway Ramp	c.y.

SECTION 9.71
MAINTENANCE AND PROTECTION OF TRAFFIC

Replace Section 9.71 in its entirety with the following:

SECTION 9.71
MAINTENANCE AND PROTECTION OF TRAFFIC

9.71.01—Description: Unless other provisions are made on the plans or in the special provisions of the Contract, the Contractor shall keep the roadway under construction open to traffic for the full length of the Project and shall provide a sufficient number of travel lanes and pedestrian passways to move that traffic ordinarily using the roadway. The travel lanes and pedestrian passways shall be drained and kept reasonably smooth and in suitable condition at all times in order to provide minimum interference to traffic consistent with the proper prosecution of the work.

Suitable ingress and egress shall be provided at all times where required, for all intersecting roads and for all abutting properties having legal access.

When a scheme for maintenance of traffic, which may include detours, is shown on the plans or described in the special provisions of the Contract, this shall govern unless an alternate scheme acceptable to the Engineer is offered by the Contractor at no additional cost. If no scheme is shown on the plans or described in the special provisions of the Contract, and the Contractor wishes to deviate from the provisions of maintaining traffic as described in this Section, the Contractor may submit and the Engineer may approve a schedule showing a proposed sequence of operations and a compatible method of maintaining traffic.

The Contractor shall provide to the Engineer the name of the person who shall be responsible for installing and maintaining all temporary traffic control devices in work zones on limited access highways. This person shall be certified as a Traffic Control Supervisor by [ATSSA](#) or hold other qualification acceptable to the Department. This certification or qualification shall be maintained and valid throughout the duration of the Contract.

9.71.03—Construction Methods: The Contractor shall furnish and erect signs closing the highway to traffic, as shown on the plans or directed by the Engineer, prior to commencing any work on the Project.

The Contractor shall furnish a sufficient number of signs, barricades, drums, traffic cones and delineators to forewarn traffic of the construction as shown on the traffic control plans contained within or as directed by the Engineer.

The Contractor shall also provide such safety measures, pavement markings, warning devices and signs as deemed necessary to safeguard and guide the traveling public through detours ordered by the Engineer, included in the approved scheme for maintenance of traffic, or as shown on the plans. The Contractor shall erect, maintain, move, adjust, clean, relocate and store these signs, barricades, drums, traffic cones and delineators when, where and as directed by the Engineer, and in accordance with the ATSSA "Quality Guidelines for Temporary Traffic Control Devices and Features."

The use of unauthorized or unapproved signs, barricades, drums, traffic cones or delineators will not be permitted.

All signs in any one signing pattern shall be mounted the same height above the traveled surface. The Contractor shall keep all signs in proper position, clean and legible at all times. Care shall be taken so that weeds, shrubbery, construction materials or equipment, and soil, are not allowed to obscure any sign, light, or barricade. Signs that do not apply to existing conditions shall be removed or adjusted so that the legend is not visible to approaching traffic.

The Contractor, when ordered by the Engineer, shall remove snow and take care of icy conditions on temporary, new and existing sidewalks on any part of the right-of-way within the limits of the Project. Payment for the cost thereof, will be made as extra work.

Snow removal and correction of icy conditions, other than those resulting from the Contractor's operations, on uncompleted contracts under traffic, will remain an obligation of the State or others.

Should the Contractor fail to perform any of the work required under this section, the State may perform or arrange for others to perform such work. In such cases, the State will deduct from money due or to become due the Contractor all expenses connected therewith which are found to be greater than the cost to the State had the Contractor performed the specified work.

9.71.04—Method of Measurement: This item, being paid on a lump sum basis, will not be measured for

payment.

9.71.05—Basis of Payment: This work will be paid for at the Contract lump sum price for "Maintenance and Protection of Traffic." This price shall include all costs for labor, training, equipment and services involved in the erection, maintenance, moving, adjusting, cleaning, relocating and storing of signs, barricades, drums, traffic cones and delineators furnished by the Contractor, as well as all costs of labor and equipment involved in the maintenance of traffic lanes and detours, except for pavement markings, ordered or included in the approved scheme for maintenance of traffic. This price shall also include furnishing and services of a trained Traffic Control supervisor for work on limited access highways.

"Maintenance and Protection of Traffic" does not include the cost of signs, barricades, drums, traffic cones, delineators, or the furnishing and placing of materials such as borrow, gravel, crushed stone, bituminous concrete for patching and pipe. These items will be paid for at their respective Contract unit prices, or in the absence of applicable Contract unit prices, as extra work. If the Engineer requires the Contractor to provide facilities in excess of the requirements of the adopted scheme for maintenance and protection of traffic, the Contractor shall perform the required work, and payment for the cost thereof will be made at applicable Contract unit prices, or in the absence of applicable Contract unit prices, as extra work.

Pay Item	Pay Unit
Maintenance and Protection of Traffic	l.s.

**SECTION 9.77
TRAFFIC CONE**

Replace Section 9.77 in its entirety with the following:

**SECTION 9.77
TRAFFIC CONE**

9.77.01—Description: Under this item the Contractor shall furnish all reflectorized orange traffic cones required on the Project to meet the requirements as stated in the item "Maintenance and Protection of Traffic," as shown on the plans and as directed by the Engineer.

The Contractor shall have, available on the Project, a sufficient number of traffic cones to fulfill all the requirements as specified in the Contract and to replace those traffic cones which have become damaged.

9.77.02—Materials: Traffic cones shall be constructed of materials to a thickness to withstand impact without damage to cones or to vehicles. The traffic cones shall be of sufficient mass or have bases to which ballast may be added to assure that they will not be blown over or displaced by wind from passing vehicles. Traffic cones used at night shall be reflectorized by utilizing Retroreflective Sheeting in accordance with M.18.09.

The following documentation shall be submitted by the Contractor prior to using traffic cones on the Project:

1. For traffic cones manufactured on or before December 31, 2019 and used for the duration of their normal service life, a copy of the manufacturer’s self-certification that the traffic cones comply with the requirements of the AASHTO Manual for Assessing Safety Hardware (MASH) or the NCHRP Report 350 is required.
2. For traffic cones manufactured after December 31, 2019, a copy of the manufacturer’s self-certification that the traffic cones comply with the requirements of the 2016 edition of the AASHTO MASH is required.

9.77.04—Method of Measurement: This item will be measured for payment by the number of traffic cones used on the Project.

9.77.05—Basis of Payment: This item will be paid for at the Contract unit price each for "Traffic Cone" used on the Project. Each cone will be paid for once, regardless of the number of times it is used on the Project.

Any traffic cones that are missing, damaged or defaced so that they are not effective, as determined by the Engineer in accordance with ATSSA "Quality Guidelines for Temporary Traffic Control Devices and Features," shall be replaced by the Contractor at no cost to the State.

When the traffic cones are no longer required on the Project they shall remain the property of the Contractor.

Pay Item	Pay Unit
Traffic Cone	ea.

**SECTION 9.78
TRAFFIC DRUM**

Replace Section 9.78 in its entirety with the following:

**SECTION 9.78
TRAFFIC DRUM**

9.78.01—Description

9.78.02—Materials

9.78.03—Construction Methods

9.78.04—Method of Measurement

9.78.05—Basis of Payment

9.78.01—Description: Under this item the Contractor shall furnish all traffic drums required on the Project to correspond to the traffic patterns, as indicated in the Contract for "Maintenance and Protection of Traffic," as shown on the plans and as directed by the Engineer.

9.78.02—Materials: Traffic Drums shall be manufactured plastic or rubber devices designed in accordance with the latest edition of the MUTCD. The design of the device will allow for the installation of barricade warning lights. The device shall be stabilized with the use of sandbags or other approved means.

Retroreflective Sheeting, in accordance with M.18.09, shall be used on traffic drums. Only one type sheeting shall be used on a drum and all drums furnished on a construction project shall be manufactured with the same type retroreflective sheeting.

The following documentation shall be submitted by the Contractor prior to using traffic drums on the Project:

1. For traffic drums manufactured on or before December 31, 2019 and used for the duration of their normal service life, a copy of the manufacturer’s self-certification that the traffic drums comply with the requirements of the AASHTO MASH or the NCHRP Report 350 is required.
2. For traffic drums manufactured after December 31, 2019 and used without attachments, a copy of the manufacturer’s self-certification that the traffic drums comply with the requirements of the 2016 edition of the AASHTO MASH is required.
3. For traffic drums manufactured after December 31, 2019 and used with attachments such as warning lights, a copy of the Federal-Aid Eligibility Letter issued by the FHWA to the manufacturer documenting that the traffic drums with the proposed attachments meet the crash test and evaluation criteria of the 2016 AASHTO MASH is required.

9.78.03—Construction Methods:

The Contractor shall have, available on the Project, a sufficient number of traffic drums to fulfill all the requirements, as specified in the Contract, to provide adequate traffic control during periods of unforeseen circumstances or emergencies.

Traffic drums shall be designed and installed in accordance with the plans, the MUTCD latest edition, and as directed by the Engineer.

Any traffic drum that is missing, damaged or defaced so that it is not effective, as determined by the Engineer and in accordance with ATSSA "Quality Guidelines for Temporary Traffic Control Devices and Features," shall be replaced by the Contractor.

When the traffic drums are no longer required on the Project, they shall remain the property of the Contractor.

9.78.04—Method of Measurement: This work will be measured for payment by the number of traffic drums used on the Project.

9.78.05—Basis of Payment: This item will be paid for at the Contract unit price each for "Traffic Drum" used on the Project. Each drum will be paid for once, regardless of the number of times it is used on the Project.

Pay Item	Pay Unit
Traffic Drum	ea.

SECTION 9.79
CONSTRUCTION BARRICADE

Replace Section 9.79 in its entirety with the following:

SECTION 9.79
CONSTRUCTION BARRICADE

9.79.01—Description: Under this item the Contractor shall furnish all construction barricades of the specified type required on the Project to comply with the requirements of NCHRP Report 350 (TL-3), or the AASHTO MASH, and the requirements stated in the item "Maintenance and Protection of Traffic," as shown on the plans and as directed by the Engineer.

9.79.02—Materials: Construction barricades shall consist of the following materials:

The frame shall be of polyvinyl chloride pipe meeting the requirements of ASTM D2241 for PVC 1120 or 1220, SDR 21 (pressure rating 200 psi), ASTM D3034, SDR 35 or an approved equal. All straight members shall be the color white.

Wyes, tees and elbows for joint connections shall be polyvinyl chloride of suitable size and strength for the purpose intended.

Joints shall not be glued and a 3/16 inch nylon rope (or equivalent) shall be threaded loosely through the pipe to keep sections from flying if hit by a vehicle.

Face panels used as horizontal members shall be constructed of a suitable plastic material, 0.060 inch high-impact styrene, anodized aluminum of no less than 0.025 inch thickness or a comparable substitute approved by the Engineer.

All hardware shall be in accordance with standard commercial specifications and shall be approved by the Engineer.

Alternate stripes of white and **fluorescent** orange retroreflective sheeting shall be applied to the horizontal members as shown on the plans. Only one type sheeting shall be used on a barricade and all barricades on a construction project shall be constructed with the same type of retroreflective sheeting. Retroreflective sheeting shall meet the requirements of M.18.09.

Construction barricades shall be designed and fabricated so as to prevent them from being blown over or displaced by wind. Construction barricades shall be approved by the Engineer before they are placed into service.

Materials Certificates shall be required confirming compliance with the requirements set forth in the plans and specifications for these barricades.

The following documentation shall be submitted by the Contractor prior to using barricades on the Project:

1. **For barricades manufactured on or before December 31, 2019 and used for the duration of their normal service life,** a copy of the **Federal-Aid Eligibility Letter** issued by the FHWA to the manufacturer documenting that the barricades **meet the crash test and evaluation criteria** of the AASHTO MASH or of the NCHRP Report 350 **is required.**
2. **For barricades manufactured after December 31, 2019,** a copy of the **Federal-Aid Eligibility Letter** issued by the FHWA to the manufacturer documenting that the barricades **meet the crash test and evaluation criteria of the 2016 AASHTO MASH is required.**

9.79.03—Construction Methods: The Contractor shall furnish a sufficient number of construction barricades required for the traffic patterns for all operations which are being undertaken concurrently. The barricades shall be constructed in a neat and workmanlike manner to the satisfaction of the Engineer.

Ineffective barricades, as determined by the Engineer and in accordance with ATSSA "Quality **Guidelines** for **Temporary** Traffic Control Devices **and Features**," shall be replaced by the Contractor at no cost to the State.

Barricades that are no longer required shall be removed from the Project and shall remain the property of the Contractor.

9.79.04—Method of Measurement: This work will be measured for payment by the number of construction barricades used on the Project.

9.79.05—Basis of Payment: This item will be paid for at the Contract unit price each for "Construction Barricade" of the type specified and used on the Project. Each barricade will be paid for once, regardless of

the number of times it is used on the Project.

Pay Item

Pay Unit

Construction Barricade (Type)

ea.

**SECTION 9.81
42 INCH TRAFFIC CONE**

Replace Section 9.81 in its entirety with the following:

**SECTION 9.81
42 INCH TRAFFIC CONE**

9.81.01—Description: This item shall consist of furnishing 42-inch retroreflective traffic cones required on the Project to meet the requirements of the traffic control plans, as stated in the item "Maintenance and Protection of Traffic," as shown on the plans or as directed by the Engineer.

The Contractor shall have available on the Project a sufficient number of traffic cones to fulfill all the requirements as specified in the Contract and to replace those which have become damaged.

9.81.02—Materials: The traffic cone shall be manufactured of 2 piece construction - cone and stabilizer base. The cone shall be constructed of impact-resistant orange plastic or rubber of a thickness able to withstand impact without damage to cones or vehicles. The bottom of the cone shall be 8 1/2 inch conical diameter tapering to the top of the cone which shall be 3 1/2 inch conical diameter. The design of the device will allow for the installation of a weighted stabilizer base. The stabilizer base shall not be round in shape. It shall have a hole in the middle to allow for quick placement over the cone. The base shall be constructed of impact-resistant black plastic or rubber ballasted to 18 lbs.

Retroreflective stripes shall be fabricated from retroreflective sheeting. All stripes shall be of one type of sheeting. Retroreflective sheeting shall be as specified in M.18.09.

The following documentation shall be submitted by the Contractor prior to using traffic cones on the Project:

1. For traffic cones manufactured on or before December 31, 2019 and used for the duration of their normal service life, a copy of the manufacturer’s self-certification that the traffic cones comply with the requirements of AASHTO MASH or NCHRP Report 350 is required.
2. For traffic cones manufactured after December 31, 2019, a copy of the manufacturer’s self-certification that the traffic cones comply with the requirements of the 2016 edition of the AASHTO MASH is required.

9.81.03—Construction Methods: The stabilizer base shall be attached to the traffic cone in accordance with the manufacturer’s instructions. The Contractor shall ensure that the devices are kept clean and bright.

9.81.04—Method of Measurement: This item will be measured for payment by the number of traffic cones used on the Project.

9.81.05—Basis of Payment: This item will be paid for at the Contract unit price for "42 Inch Traffic Cone" used on the Project. Each cone will be paid for once, regardless of the number of times it is used on the Project.

Any traffic cones that are missing, damaged or defaced so that they are not effective, as determined by the Engineer, and in accordance with ATSSA "Quality Guidelines for Temporary Traffic Control Devices and Features," shall be replaced by the Contractor at no cost to the State.

When the traffic cones are no longer required on the Project, they shall remain the property of the Contractor.

Pay Item	Pay Unit
42 Inch Traffic Cone	ea.

**SECTION 10.18
NAVIGATION LIGHT**

Delete Section 10.18 in its entirety.

**SECTION 11.12
MAGNETIC VEHICLE DETECTOR**

Delete Section 11.12 in its entirety.

SECTION 18.03
IMPACT ATTENUATION SYSTEM
TEMPORARY IMPACT ATTENUATION SYSTEM

Replace Section 18.03 in its entirety with the following:

SECTION 18.03
IMPACT ATTENUATION SYSTEM
TEMPORARY IMPACT ATTENUATION SYSTEM

18.03.01—Description: Work under this item shall consist of furnishing, installing and maintaining an impact attenuation system of the type specified at the location shown on the plans. Work under this item shall also include repair of the impact attenuation system.

18.03.02—Materials: The impact attenuation system shall be listed on the Department's [Qualified Products List](#) for the compatible barrier type.

The reflector shall meet the requirements of M.18.09.

The concrete pad foundation shall meet the requirements of M.03.

Reinforcement shall meet the requirements of M.06.

18.03.03—Construction Methods: The impact attenuation system shall be installed or repaired according to the manufacturer's recommendations at the location shown on the plans.

Any "Non-Gating" type impact attenuation system shall be installed on a reinforced concrete pad foundation. The reinforced concrete pad foundation shall be constructed in accordance with the manufacturer's recommendations.

Any damaged impact attenuation system shall be repaired within 24 hours of notification from the Engineer. The Contractor shall be responsible for the removal and the proper disposal of all damaged material and debris.

18.03.04—Method of Measurement: The impact attenuation system will be measured for payment by the number of each system installed and accepted by the Engineer.

The sum of money shown on the estimate and in the itemized proposal as "Estimated Cost" for repair of impact attenuation system 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.

18.03.05—Basis of Payment: Impact attenuation system will be paid at the Contract unit price for each "Impact Attenuation System (Type)" furnished and installed, which price shall include the reflector and all materials, transportation, equipment, tools and labor incidental thereto. Temporary impact attenuation system will be paid at the Contract unit price for each "Temporary Impact Attenuation System (Type)" furnished, installed and removed, which price shall include the reflector and all materials, transportation, equipment, tools and labor incidental thereto.

There will be no direct payment made for the reinforced concrete pad foundation, required for installation of any "Non-Gating" type impact attenuation system, but the costs of this work shall be included under the Contract unit price for each "Impact Attenuation System (Type)."

"Repair of Impact Attenuation System" will be paid for in accordance with 1.09.04 as required to restore the system to its full working condition in accordance with the manufacturer's recommendations.

Maintenance and Protection of Traffic will only be paid for when, in the judgment of the Engineer, it is solely required for repair of the system.

Pay Item	Pay Unit
Impact Attenuation System (Type)	ea.
Temporary Impact Attenuation System (Type)	ea.
Repair of Impact Attenuation System (Type)	est.

**SECTION M.03
 PORTLAND CEMENT CONCRETE**

Replace Section M.03 in its entirety with the following:

**SECTION M.03
 PORTLAND AND HYDRAULIC CEMENT CONCRETE**

M.03.01—Component Materials

M.03.02—Cast-in-Place Concrete 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—Vacant

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: 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](#).

(a) **Portland Cement (PC):** 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.

(b) **Blended Hydraulic Cements:** Types IS, IP, IL, and IT hydraulic cements consisting of Portland Cement and supplemental cementitious materials shall meet the requirements of AASHTO M 240.

(c) **Supplemental Cementitious Material (SCM):** Unless already qualified as a Standard Mix Design, Contractor proposed Mix Designs with partial replacement of Portland Cement (PC) by the concrete producer with an SCM, 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 SCM 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.

3. **Ground Glass Pozzolan (GGP):** GGP used as a partial replacement for Portland cement shall meet the requirements of ASTM C1866. Alkali-silica reactivity with aggregates contained in the mix will need to be evaluated by the concrete producer to the satisfaction of the Engineer prior to use. The Engineer may restrict or prohibit the use of GGP considering the ambient temperatures anticipated during the placement and initial curing of the concrete.

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 [ASTM C1602](#) and [ASTM 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 [accredited](#) by the Cement and Concrete Reference Laboratory (CCRL). The statement shall contain results of compression tests of cylinder specimens made with concrete [using](#) the admixture(s) in proportions equal to those proposed by the Contractor. The results of at least [five](#) standard 6 inch × 12 inch cylinders of each mix design shall be listed with the results of at least [five](#) like-sized cylinders not [using](#) 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—Cast-in-place (CIP) Standard Mix Design Requirements

1. Standard CTDOT Mix Designs: CIP Standard Mix Designs shall be developed in accordance with applicable sections of ACI 211 and ACI 318. The mixtures shall consistently demonstrate the properties listed in Table M.03.02-1. The CIP 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 and Hydraulic Cement Concrete Performance Criteria

Class ¹	Compressive Strength (psi) @ 28 days AASHTO T 22	Electrical Resistivity (Permeability) kΩ-cm AASHTO T 358
PCC0223Z	2200	NA
PCC0334Z	3300	NA
PCC0336Z	3300	NA
PCC0354Z	3500	NA
PCC0446Z	4400	NA
PCC04462	4400	29 minimum @ 56 days
PCC0556Z	5500	NA
PCC05562	5500	29 minimum @ 56 days
PCCXXX83 ²	XXX00	15 maximum @ 28 days
PCCXXX82	XXX00	29 minimum @ 56 days
¹ PCCXXXYZ where: PCC = Portland Cement Concrete XXX = 28-day minimum compressive strength (psi x 100) Y = Nominal Maximum Aggregate Size (U.S. Sieve No. Designation) Z = Exposure Factor (See Table M.03.02-1a)		
² 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	Exposed Elements not in contact with salt water or deicing chemicals
2 Severe	Structural Elements in substantial and consistent contact with salt water, deicing chemicals, flowing/standing water (limited use)
3 Special	Thin Elements repaired with concrete incorporating sacrificial anodes (limited use)

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 qualified by the Department on a standing basis. Submittal or re-qualification of these Standard Mix Designs on an annual basis is not required. Previously qualified producer-designed Standard Mixes that have a record of satisfactory performance may be used 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 **qualified** 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 **qualified** by the TDC prior to use. The use of an approved admixture with an otherwise **qualified** Standard Mix Design is not considered non-standard.

M.03.03—Producer Equipment and Production Requirements

1. General Requirements: The source of the concrete must be **qualified** 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. **Qualification** may be revoked at any time in accordance with 1.06.01.

- (a) **Inspection:** The production facility supplying hydraulic cement concrete **must** have a current Certification of Ready Mixed Concrete Production Facilities from the National Ready Mixed Concrete Association (NRMCA), or equivalent certification **acceptable** to the Engineer.
- (b) In addition to the requirements of third party certification, the facility shall produce batch tickets that meet the requirements of **6.01.03-II-3(a)** for each delivery to Department projects.
- (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 **demonstrated to the satisfaction** of 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 or 1.20-1.06.07. The Contractor shall also provide, when requested by the Engineer, samples of the premixed anchoring cement for testing and approval.

M.03.07—Vacant

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 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. Coated or sleeved metallic devices shall be made of steel that meets or exceeds the requirements of AASHTO M 255 Grade 75. Nonmetallic devices shall meet the strength requirements applicable to metallic devices.
- (b) All load transfer devices shall be galvanized and shall meet the requirements of M.06.01. 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 of Certified Test Reports meeting the requirements of 1.06.07 or 1.20-1.06.07 demonstrating that the load transfer device meets these requirements. The Engineer reserves the right to reject any load transfer device deemed unsatisfactory for use.

2. Longitudinal Joint Devices for Concrete Pavement: 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.

3. Joint Filler for Concrete Sidewalks and Curbing: Expansion joint filler shall be either preformed expansion joint filler or preformed rubber as indicated on the plans and shall meet the following requirements:

- (a) Preformed expansion joint filler shall be a resilient bituminous cellular type that meets the physical requirements of AASHTO M 213 and the testing requirements of ASTM D545.
- (b) Preformed rubber joint filler shall be semi-rigid, non-extruding, resilient type, closed-cell polypropylene foam meeting the requirements of ASTM D8139.

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.

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 [ASTM D6690](#) 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 [ASTM C920 Type S \(Single Component\)](#), [Grade P \(Pourable, Self-leveling\)](#), or [Grade NS \(Non-sag type\)](#), [Class 50](#), or other approved single component polyurethane-base elastomeric sealant.

A Certified Test Report will be required in accordance with [1.06.07](#) or [1.20-1.06.07](#).

2. Where "Silicone Joint Sealant" is specified on the plans, it shall be one of the following sealants manufactured by the [Dow Corning Corporation](#), or an approved equal:

i. [DOWSIL 888 Silicone Joint Sealant](#)

ii. [DOWSIL 890-SL Self-Leveling Silicone Joint Sealant](#)

6. Closed Cell Elastomer: The closed cell elastomer shall meet the requirements of [ASTM D1056, Grade 2B2](#). 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](#) or [1.20-1.06.07](#).

If requested by the DMT, the Contractor shall furnish a 1 foot length of closed cell elastomer in each lot for purposes of inspection and testing by the Engineer.

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 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**

Replace Section M.04 in its entirety with the following:

**SECTION M.04
BITUMINOUS CONCRETE MATERIALS**

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 asphalt binder, emulsion, aggregate, and production facility used to manufacture bituminous concrete mixture, and laboratory testing the mixture must be qualified on an annual basis by the Engineer.

The basis of qualification for asphalt binder sources is participation in the AASHTO Product Evaluation and Audit Solutions (formerly NTPEP), Asphalt Binder Suppliers (ABS) program and review of the sources' Quality System Manual and on-site audit report from AASHTO Product Evaluation and Audit Solutions by the Department. In addition, each source must submit monthly split samples to the Department's Central Laboratory for each grade of binder currently or potentially supplied to Department projects.

The basis of qualification for emulsion sources is the submittal of a "Quality Control Plan for Emulsified Asphalt" (Tack Coat) formatted in accordance with AASHTO R 77 to the Engineer for review. In addition, a split sample per grade must be submitted to the Department's Central Laboratory on a monthly basis.

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

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

The basis of testing laboratory qualification for mixture testing is all testing equipment, supplies, and safety equipment shall be capable of performing all the applicable tests in their entirety that are referenced in AASHTO R 35 and AASHTO M 323 and requirements indicated in M.04.01-11

AASHTO/ASTM Standards noted with an (M) have been modified and are detailed in Table M.04.03-5.

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

1. Coarse Aggregate: All coarse aggregate shall meet the requirements listed in M.01.

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 from the storage tank to the Engineer upon request. The person(s) shall assure that each shipment is accompanied by a statement certifying that the transport vehicle was inspected before loading was found acceptable for the material shipped and that the binder is free of contamination from any residual material, along with 2 copies of the bill of lading.
- iv. The blending or combining of PG binders in one storage tank at the Plant from different suppliers, grades, or additive percentages is prohibited.

(b) Standard Performance Grade (PG) Binder:

- i. Standard PG binder shall be defined as "Neat." Neat PG binders shall be free from modification with: fillers, extenders, reinforcing agents, adhesion promoters, thermoplastic polymers, acid

modification and other additives such as re-refined motor oil, and shall indicate such information on each bill of lading and Certified Test Report. The standard asphalt binder shall be PG 64S-22.

- (c) **Modified Performance Grade (PG) Binder:** The modified asphalt binder shall be Performance Grade PG 64E-22 asphalt modified solely with a Styrene-Butadiene-Styrene (SBS) polymer. The polymer modifier shall be added at either the refinery or terminal and delivered to the 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.
- (d) **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), AASHTO M 208, or as applicable herein.
- ii. The emulsified asphalts shall be free of contaminants such as fuel oils and other solvents.
- iii. The blending at mixing Plants of emulsified asphalts from different suppliers is prohibited.
- iv. **Materials used for tack coat shall not be diluted.**

(b) **Basis of Approval:**

- i. 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 or 60°F, and a Material Certificate.
- ii. Anionic emulsified asphalts shall meet the requirements of AASHTO M 140. Materials used for **anionic** tack coat shall meet grade RS-1 or RS-1h. When ambient temperatures are 80°F and rising, grade SS-1 or SS-1h may be substituted if permitted by the Engineer.
- iii. Cationic emulsified asphalt shall meet the requirements of AASHTO M 208. Materials used for **cationic** tack coat shall meet grade CRS-1. The settlement and demulsibility test will not be performed unless deemed necessary by the Engineer. When ambient temperatures are 80°F and rising, grade CSS-1 or CSS-1h may be substituted if permitted by the Engineer.
- iv. **Non-Tracking emulsion shall meet the requirements of Table M.04.01-1.**

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

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

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 or 1.20-1.06.07 certifying that the joint seal material meets the requirements of this Section.

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

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

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

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)	
	HMA	WMA/PMA
Open Surge	4	Mfg Recommendations*
Unheated - Non-insulated	8	Mfg Recommendations*
Unheated - Insulated	18	Mfg Recommendations*
Heated - No inert gas	TBD by the Engineer	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 AASHTO T 195(M).

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

(f) RAP: RAP moisture content shall be determined a minimum of twice daily (prior to production and halfway through production).

(g) Asphalt Binder: A binder log shall be submitted to the Department's Central Lab on a monthly basis.

(h) Warm mix additive: For mechanically foamed WMA, the water injection rate shall be monitored during production and not exceed 2.0% by total weight of binder. For additive added at the Plant, the dosage rate shall be monitored during production.

11. Testing Laboratory: The laboratory shall be provided with functioning equipment and adequate supplies 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. The laboratory shall have a PC with internet connection capable of submitting electronic test results to the Engineer.

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

The laboratory shall maintain a list of equipment used in the acceptance testing processes including, but not limited to, balances, scales, manometer/vacuum gauge, thermometers, and gyratory compactor, clearly showing calibration and/or inspection dates, in accordance with AASHTO R 18.

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

1. Curb Mix:

(a) Requirements: The Contractor shall use 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 accredited laboratory [AASHTO re:source](#) 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 [AASHTO re:source](#) 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 [Department's Central Laboratory](#) for design TSR testing verification. The mixture submitted shall be representative of the corresponding mix design as determined by the Engineer.

- 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 **developed for** each bituminous concrete **facility** prior to the beginning of the paving season.

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

Criteria 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.

“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.

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

1. no compliant acceptance production test results have been submitted to the Department from the previous year;
2. there is a source change in one or more aggregate components;
3. there is a component percentage change of more than 5% by weight;
4. there is a change in RAP percentage;
5. the mixture has a rating of less than 70% from the previous season;
6. it is a new JMF not previously submitted; or
7. 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 until modifications are made at the facility. Sufficient testing by NETTCP certified personnel must confirm that specification requirements in Tables M.04.02-2 through M.04.02-4 are met and the binder content (Pb) meets the requirements in Table M.04.03-2 before material can be used. One of the following methods must be used to verify the test results:

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

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

Department Witness or verification of compliant test results will change the mix’s status to “A”

The differences between the Department’s test results and the Contractor’s must be within the “C” tolerances included in the [Department’s QA Program for Materials](#) in order to be verified.

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

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

Notes:

⁽¹⁾ 95/90 denotes that a minimum of 95% of the coarse aggregate, by mass, shall have one fractured face and that a minimum of 90% shall have two fractured faces.

⁽²⁾ Criteria presented as maximum Percent by mass of flat and elongated particles of materials retained on the No. 4 sieve, determined at 5:1 ratio.

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

Traffic Level	Design ESALs (million)	Number of Gyration by Superpave Gyrotory Compactor			Percent Density of Gmm from HMA/WMA Specimen			Voids Filled with Asphalt (VFA) Based on Nominal Mix Size - Inch			
		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 Contractor representative shall obtain a field sample of the material placed at the project site in accordance with AASHTO R 97 or an alternate procedure approved by the Engineer. Sampling from the truck at the Plant in accordance with AASHTO R 97 will be allowed for those mixes with a total estimated project tonnage equal to or less than 500 tons. **The Contractor's representative obtaining mix samples must be a certified NETTCP HMA Paving Inspector, NETTCP HMA Plant Technician, or has successfully completed the HMA Field Sampling Course administered by the Connecticut Advanced Pavement Laboratory.** Regardless of sampling location, the sample shall be quartered by the Contractor in accordance with AASHTO R 47 and placed in an approved container. **For samples obtained at the project site, a Type A Mechanical Splitter shall be used to quarter the sample in accordance with AASHTO R 47.** 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 Department's Central Laboratory in Rocky Hill, retain one of the sealed containers for potential use in dispute resolution and test the remaining samples for acceptance in accordance with past practice.

The Contractor shall submit all acceptance test 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 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 R 97	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 Gyratory 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%,

- target binder over 0.15%,
- any component specific gravity; or
- a lot spanning 30 calendar days.

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

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

The payment adjustment will be calculated as described in 4.06.

TABLE M.04.03-2:

Superpave Acceptance Testing Frequency per Mix 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⁾
1,001 to 1,500	3 ⁽¹⁾
1,501 or greater	1 per 500 tons or portions thereof

Notes: ⁽¹⁾ For daily quantities produced over 500 tons, the final acceptance test shall always be performed with material from the last sub lot regardless of the predetermined random selections

The following test procedures shall be used for acceptance:

TABLE M.04.03-3: Superpave Acceptance Testing Procedures

Protocol	Procedure	Description
1	AASHTO R 97	Sampling of 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 AASHTO re:source certified laboratory by NETTCP certified

technicians. The compacted specimens may be fabricated at the Plant and then tested at an [AASHTO re:source](#) accredited facility.

A minimum of 45000 grams of plant blended mixture and the corresponding complete Form MAT-412s shall be submitted to the [Department's Central Laboratory](#) 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 [AASHTO re:source](#) certified laboratory by NETTCP certified technicians.

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

TABLE M.04.03-4: Superpave Mixture Production Requirements

	S0.25		S0.375		S0.5		S1		Tolerances
Sieve	Control Points		Control Points		Control Points		Control Points		From JMF Targets ⁽²⁾
inches	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	Min (%)	Max (%)	+/- Tolerance
1.5	-	-	-	-	-	-	100	-	
1.0	-	-	-	-	-	-	90	100	
3/4	-	-	-	-	100	-	-	90	
1/2	100	-	100	-	90	100	-	-	
3/8	97	100	90	100	-	90	-	-	
No. 4	72	90	-	72	-	-	-	-	
No. 8	32	67	32	67	28	58	19	45	
No. 16	-	-	-	-	-	-	-	-	
No. 200	2.0	10.0	2.0	10.0	2.0	10.0	1.0	7.0	
Pb	JMF value		JMF value		JMF value		JMF value		0.3 ⁽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	All laboratory technician(s) responsible for testing PG binders shall be certified or Interim Qualified by NETTCP as a PG Asphalt Binder Lab Technician. All laboratories testing binders for the Department are required to be accredited by AASHTO re:source . Sources interested in being approved to supply PG binders to the Department by use of an "in-line blending system" must record properties of blended material and additives used. Each source of supply of PG binder must indicate that the binders contain no additives used to modify or enhance their performance properties. Binders that are manufactured using additives, modifiers, extenders, etc., shall disclose the type of additive, percentage and any handling specifications or limitations required. All AASHTO M 320 references shall be replaced with AASHTO M 332. Once a month, 1 split sample and test results for each asphalt binder grade and each lot shall be submitted by the PG binder supplier to the Department's Central Lab. Material remaining in a certified lot shall be re-certified no later than 30 days after initial certification. Each April and September, the PG binder supplier shall submit test results for 2 BBR tests at 2 different temperatures in accordance with AASHTO R 29.

**SECTION M.06
METALS**

Revise the first sentence of Article M.06.02 Structural Steel as follows:

Certified Test Reports and Materials Certificates for structural steel shall be submitted in accordance with 1.06.07 or 1.20-1.06.07.

In Subarticle M.06.02-2(b) (Anchor Bolts: Certified Test Reports and Material Samples) revise the first sentence as follows:

The Contractor shall submit copies of the Certified Test Reports in accordance with 1.06.07 or 1.20-1.06.07. (*delete the word notarized*)

In Subarticle M.06.02-3 (f) (High Strength Bolts: Certified Test Reports and Materials Certificates) revise the first sentence as follows:

The Contractor shall submit copies of the Certified Test Reports and Materials Certificates in accordance with 1.06.07 or 1.20-1.06.07 for fastener assemblies. (*delete the word notarized*)

Replace Article M.06.03 (Galvanizing) 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.

The use of aerosol galvanizing products is strictly prohibited. This applies to both shop and field touch ups or repairs.

When mechanical galvanizing is used it shall meet the requirements of ASTM B695 Class 55.

**SECTION M.07
PAINT**

Replace Section M.07 in its entirety with the following:

**SECTION M.07
PAINT**

M.07.01—General for All Paints and Enamels

M.07.02—Coating Systems for Structural Steel

M.07.03 through M.07.19 —Vacant

M.07.20—Waterborne Pavement Marking Paint

M.07.21—Hot-Applied Waterborne Pavement Marking Paint

M.07.22—Epoxy Resin Pavement Markings

M.07.23—Vacant

M.07.24—Preformed Black Line Mask Pavement Marking Tape

M.07.25—Vacant

M.07.30—Glass Beads

M.07.01—General for All Paints and Enamels:

1. Paints and enamels shall consist of pigments of the required fineness and composition, ground in the required vehicle by a suitable grinding machine to the required fineness. All pigments, resins, oils, thinners and driers shall be free from adulterants.

2. Proportions: All proportions in formulas are by weight unless otherwise specified.

3. Fineness: All pigments, except aluminum, unless otherwise specified, shall be finely ground with 100% passing the No. 200 sieve; with no less than 97% passing the No. 325 sieve.

4. Curdling, Livering, Leveling: The paint or enamel shall not liver or curdle. The pigment shall remain in suspension in a satisfactory manner through the expected shelf life specified on the label. The enamel type paints shall level properly and not show brush marks.

5. Colors: All paints and enamels shall be matched to the Department's standard shades.

6. Time of Drying: All paints or enamels, unless otherwise specified, shall dry to full gloss in not more than 18 hours.

7. Weight per Gallon: The weight per gallon of all paints and enamels shall be determined at 77°F.

8. Shipping: All paints and enamels shall be shipped in containers plainly marked with the name, net weight and volume of paint or enamel content. The manufacturer's name, address, date and lot number shall be marked on every package.

9. Samples, Sampling, and Testing: The manufacturer shall supply a Certified Test Report per lot for any pigment, oil, resin, thinner, drier or paint. When a portion of the lot is delivered, a Material Certificate is required. Upon request by the Engineer, the manufacturer shall submit a sample in accordance with the latest edition of the Materials Testing Manual's "[Minimum Schedule for Acceptance Testing](#)."

Sampling and testing shall be performed in accordance with ASTM, Federal Standards, or by methods established by the Department.

M.07.02—Coating Systems for Structural Steel: The coating system used shall be specified in the Contract and shall be selected from the [Northeast Protective Coating Committee's](#) (NEPCOAT's) Specification Criteria for Protective Coatings qualified products list.

Color: The color of the topcoat material shall be as noted on the plans ([AMS-STD-595](#) Color Number).

Packaging and Labeling of Coating Material: The container shall be designed to store the specific coating material. Each container of coating material shall bear a label that identifies the name of the coating manufacturer, the name of the product, the lot and batch numbers, the date of manufacture and the shelf life expiration date. The label shall also include complete specific instructions for opening the container and for mixing, thinning, and applying the coating material contained therein. If the coating material cannot be positively identified from the label on the container, it shall not be used.

Delivery: Coating material shall be furnished in the manufacturer's original sealed and undamaged container.

Control of Materials: For each coating material, a Materials Certificate shall be submitted in conformance

with 1.06.07 or 1.20-1.06.07. The Material Certificate shall indicate compliance with NEPCOAT Acceptance Criteria for Protective Coatings, List A or B.

M.07.03 through M.07.19—Vacant

M.07.20—Waterborne Pavement-Marking Paint: Pavement-marking paint shall be waterborne paint and shall be white or yellow, depending on its use, for application on bituminous concrete and Portland cement concrete pavement. This paint shall be compatible with the stripe-painting equipment to be used on the Project. All requirements shall be as specified in M.07.21, except as follows:

1. Total nonvolatile compounds shall not be less than 70% by weight.
2. Pigment shall be 50 to 60% by weight.
3. Drying time for no-pick-up shall be 15 minutes or less when tested in accordance with ASTM D711.
4. The Contractor shall provide a Materials Certificate in accordance with 1.06.07 or 1.20-1.06.07 for each portion of a batch or lot delivered to the Project site.

M.07.21—Hot-Applied Waterborne Pavement-Marking Paint: Fast-drying waterborne pavement-marking paint to be applied on bituminous concrete and Portland cement concrete pavements shall be the color specified on the plans. This paint shall be capable of being applied with stripe-painting equipment at an application temperature of 130 to 145°F and shall have good spraying characteristics. The Contractor shall provide a Materials Certificate in accordance with 1.06.07 or 1.20-1.06.07 for each portion of a batch or lot delivered to the Project site.

General: Specifications and publications that apply are as follows:

- FS TT-P-1952 - Paint, Traffic and Air Field Marking, Waterborne
- Federal Test Method Standard (FTMS) No.141 - Paint, Varnish, Lacquer and Related Materials, Methods of Inspection, Sampling and Testing
- **The MUTCD**

ASTM Standards:

- D211 - Specifications for Chrome Yellow and Chrome Orange Pigments
- D476 - Classification for Dry Pigmentary for Titanium Dioxide Pigments

Detailed Requirements, Formulation and Manufacture: The paint shall be formulated and manufactured from first-grade raw materials and shall be free from defects and imperfections. The materials shall not exhibit settling or jelling after storage in the sealed containers upon receipt. The paint shall provide the proper anchorage, refraction and reflection for the finished glass spheres when applied as specified.

Composition: The composition of the paint material shall meet the requirements of any applicable Federal, State or Local regulation for products of this type and shall meet the following requirements:

1. Paint shall not contain more than 0.06% lead when tested in accordance with ASTM D3335
2. Total nonvolatile organic compounds shall be a minimum of 76% by weight
3. Pigment shall be 58 to 63% by weight when tested in accordance with ASTM D3723
4. Resin solids shall be composed of 100% acrylic emulsion polymer
5. Volatile organic compounds shall not exceed 1.25 lb./gal. excluding water when tested in accordance with ASTM D2369
6. Flash Point: Closed-cup flash point shall not be less than 145°F
7. Density: Weight per gallon shall not be less than 12.5 lb./gal. when tested in accordance with ASTM D1475

Viscosity: The consistency of the paint shall not be less than 80, nor more than 90 Krebs units when tested in accordance with ASTM D562.

Flexibility: The paint shall not show cracking or flaking when tested in accordance with ASTM D522. The panels shall be lightly buffed with steel wool and thoroughly cleaned with solvent before being used for tests.

Dry Opacity: Both white and yellow paints shall have a minimum contrast ratio of 0.96 when tested in accordance with ASTM D2805. Contrast ratio shall be determined by applying a wet film thickness of 0.005 inch to a standard hiding-power chart. After drying, the black- and- white-reflectance values shall be determined using a suitable reflectometer and the contrast ratio determined.

Bleeding: The paints shall have a minimum bleeding ratio of 0.97 when tested in accordance with FS TT-P-1952.

Abrasion Resistance: No less than 210 liters of sand shall be required to remove paint film when tested in accordance with FS TT-P-1952.

Color: The paint shall not discolor in sunlight and shall maintain colorfastness throughout its life. Color determination shall be made without beads, after a minimum of 24 hours. **Paint color shall be in accordance with the MUTCD.**

Glass Bead Adhesion: The paint with glass beads conforming to M.07.30, applied at the rate of 6.0 lb./gal. of paint, shall require not less than 150 liters of sand to remove paint film and glass beads.

Scrub Resistance: The paint shall pass 300 cycles minimum when tested in accordance with ASTM D2486.

Drying Time: Drying time to no pick-up shall be 3 minutes or less when tested in accordance with ASTM D711.

M.07.22—Epoxy Resin Pavement Markings:

General Requirements:

Identification: Each container must be labeled with the following information: Name and address of manufacturer, production batch number, date of manufacture, grade name and/or identification number, type of material, number of gallons, Contract number, directions for mixing and application.

Certification: The Contractor shall provide a Material Certificate in accordance with 1.06.07 or 1.20- 1.06.07 for each portion of a batch or lot delivered to the Site.

Detailed Requirements:

- (a) **Epoxy Resin Material:** The material shall be composed of epoxy resins and pigments only. The white and the yellow epoxy resin materials shall be composed of approved materials and be lead- and chromium-free.
- (b) **Composition:**

WHITE (percent by weight)	YELLOW (percent by weight)
20% ± 2% Titanium Dioxide (ASTM D476 Type III)	
80% ± 2% Epoxy Resins	75% ± 2% Epoxy Resins

(c) **Color:** The white material shall be **in accordance with the MUTCD**, when the material is placed in a type EH weatherometer for a period of 500 hours and weathered according to ASTM G152. The yellow material shall be **in accordance with the MUTCD**.

(d) **Adhesion Capabilities:** When the adhesion of the material to Portland cement concrete is tested in accordance with AASHTO T 237, the failure of the system must take place in the concrete.

(e) **Abrasion Resistance:** When the abrasion resistance of the material is tested according to ASTM D4060 with a CS-17 wheel under a load of 1000 grams for 1000 cycles, the wear index shall be no greater than 82.

(f) **Hardness:** The Type D durometer hardness of the material shall be not less than 75 nor more than 90 when tested in accordance with ASTM D2240 after the material has cured for 72 hours at 73°F ± 3.5°F.

(g) **Tensile Strength:** The tensile strength of the material, when tested in accordance with ASTM D638, shall not be less than 6,000 psi after 72 hours cure at 73°F ± 3.5°F.

(h) **Compressive Strength:** The compressive strength of the material, when tested in accordance with ASTM D695, shall not be less than 12,000 psi after 72 hours cure at 73°F ± 3.5°F.

(i) **Shelf Life:** The individual components shall not require mixing prior to use when stored for a period of 12 months.

(j) **Glass Beads:** The glass beads shall meet the requirements of M.07.30.

M.07.23—Vacant

M.07.24—Preformed Black-Line Mask Pavement-Marking Tape:

General Requirements: The preformed, patterned black-line mask pavement-marking tape shall consist of a matte black, non-reflective tape in widths or sizes sufficiently large to mask the existing markings which are to be temporarily covered.

The patterned masking tape shall be pre-coated with a pressure sensitive adhesive and shall be capable of being adhered to existing markings, on bituminous concrete pavement or Portland cement concrete in accordance with the manufacturer's instructions without the use of heat, solvents or other additional

adhesives, and shall be immediately ready for traffic use after application. The Contractor shall identify equipment necessary for proper application and removal, and make recommendations for application that will assure effective product performance.

The preformed, patterned black-line masking pavement-marking tape shall be suitable for use for 1 year after the date of receipt when stored in accordance with the manufacturer's recommendations.

Detailed Requirements:

- (a) **Composition:** The non-reflective, patterned black-line mask pavement-marking tape shall not contain metallic foil and shall consist of a mixture of high quality polymeric materials, pigments and inorganic fillers distributed throughout its base cross-sectional area, with a matte black non-reflective top layer. The patterned surface shall have a minimum of 20% of the surface area raised and coated with non-skid particles. The channels between the raised areas shall be substantially free of particles. The film shall be pre-coated with a pressure sensitive adhesive. A non-metallic medium shall be incorporated to facilitate removal.
- (b) **Skid Resistance:** The surface of the patterned, non-reflective black-line mask pavement-marking tape shall provide an initial average skid resistance value of 60 British Pendulum Number when tested in accordance with ASTM E303.
- (c) **Thickness:** The patterned material, without adhesive, shall have a minimum thickness of 0.065 inch at the thickest portion of the patterned cross-section and a minimum thickness of 0.02 inch at the thinnest portion of the cross-section.
- (d) **Adhesion:** The black-line mask pavement-marking tape shall adhere to the pavement and existing pavement markings under climatic and traffic conditions normally encountered in the construction work zone.
- (e) **Removability:** The black-line mask pavement-marking tape shall be capable of being removed after its intended use without the use of heat, solvents, grinding, sand or water blasting.

M.07.25—Vacant

M.07.30—Glass Beads: The glass beads shall meet the requirements of AASHTO M 247, Type 1 or 4, depending on application.

**SECTION M.14
PRESTRESSED CONCRETE MEMBERS**

Replace Section M.14 in its entirety with the following:

**SECTION M.14
PREFABRICATED CONCRETE MEMBERS**

M.14.01—Materials

M.14.01—Materials:

- 1. Concrete:** The concrete for the members shall be air-entrained concrete composed of Portland cement, fine and coarse aggregates, admixtures and water. The concrete shall meet the properties listed in Table M.14-1 for the class designated on the plans.

Table M.14-1 Precast/Prestressed Portland Cement Concrete Mix Classes

Class	28-day Strength (psi)	Resistivity (k Ω -cm) at 56 days AASHTO T 358	Entrained Air
PRC04060	4,000	NA	6.0 +/- 1.5%
PRC04062	4,000	29	6.0 +/- 1.5%
PRC05060	5,000	NA	5.0 +/- 1.5%
PRC05062	5,000	29	5.0 +/- 1.5%
PRC06060	6,000	NA	5.0 +/- 1.5%
PRC06062	6,000	29	5.0 +/- 1.5%
PRC08060	8,000	NA	5.0 +/- 1.5%
PRC08062	8,000	29	5.0 +/- 1.5%
PRC10060	10,000	NA	4.0 +/- 1.5%
PRC10062	10,000	29	4.0 +/- 1.5%

PRCXYZ() PRC=Precast/Prestressed Concrete

XXX = 28-day strength (x100 psi) Y=Stone size (No. 6 = No. 67)

Z= (0=no resistivity requirement, 2=resistivity requirement)

- a) **Coarse and Fine Aggregate** shall meet the requirements of M.01.
 - b) **Water and all Admixtures** shall meet the requirements of M.03.01.
 - c) **Portland Cement** shall meet the requirements of M.03.01, except that mixes using Type III or Type IIIA Portland cement will be considered standard. Mixes using other cement types will be considered non-standard.
- 2. Prestressing Steel:** Unless otherwise specified, prestressing elements shall be uncoated, high tensile strength, seven-wire strand meeting the requirements of AASHTO M 203.
 - 3. Reinforcing Steel and Tie Wire:** All deformed bars, stirrups, dowels, threaded dowels and tie wire shall meet the requirements of 6.02 and M.06.01-1.
 - 4. Lifting Hooks, Pipe Sleeves, Base Protective Plates, Threaded Inserts:** These components shall be as indicated on the Shop and Working Drawings.
 - 5. Transverse Tie Strands** shall be of the size and type noted on the plans, coated with a corrosion-resistant mastic and inserted into a polyethylene tube.
 - 6. Non Shrink Grout** shall meet the requirements of M.03.05.
 - 7. Void Forms:** Internal voids may be formed by the use of void forms especially made for this purpose. These void forms must be of substantial construction and be adequately waterproofed in order to maintain their shape during the entire fabrication process. These void forms shall be as indicated on the Shop and Working Drawings.
 - 8. Metal Tie Wires, Clips, Bar supports:** Unless otherwise noted on the plans, all wires, clips, chair and bar supports, used during the fabrication and placement of the reinforcing bars shall be of the same type as the reinforcing steel.
 - 9. Penetrating Sealer Protective Compound:** The penetrating sealer shall conform to M.03.09.

**SECTION M.15
HIGHWAY ILLUMINATION**

In the list of Articles, change the title of Article M.15.16 as follows:

M.15.16—Vacant

In the first sentences of subarticles M.15.15-5 and M.15.15-6, change “PCC03340” to “PCC04461”

Replace Article M.15.16 with the following:

M.15.16—Vacant

SECTION M.16
TRAFFIC CONTROL SIGNALS

In the list of Articles, change the titles of Articles M.16.08 and M.16.13 as follows:

M.16.08—Pedestrian Pushbutton

M.16.13—Vacant

Replace Subarticle M.16.06-9 in its entirety as follows:

M.16.06—Traffic Signals:

9. Painting: All surfaces of the signal housing, housing door, visors, inside and out, the back surface of the backplate and all brackets and hardware shall be cleaned and coated with a Primer conforming to FS TT-P-1757. The surfaces shall then be finished with 3 coats of infrared oven baked paint applied by the manufacturer, before assembly.

First Coat: The primer shall be iron oxide baking primer and shall meet or exceed the requirements of FS TT-P-664.

Second Coat: Shall be light gray exterior baking enamel and shall comply with FS TT-E-489, either No. 16251, No. 16314, or No. 16376 Gray.

Third Coat: Shall be exterior baked enamel and shall comply with FS A-A-2962.

The housing, housing door, the back surface of the backplate, and all brackets and hardware shall be painted black by the manufacturer. The color shall be Aerospace Material Specification – Standard 595 (AMS-STD-595) Color No. 17038.

At intersections at Merritt Parkway interchanges, the housing, housing door, the back surface of the backplate, and all brackets and hardware shall be painted black by the manufacturer. The color shall be AMS-STD-595 Color No. 14056.

The outside of the visors shall have a dull black finish that meets FS TT-E-527.

The inside of the visors and front surface of the backplate per the MUTCD shall have a dull black finish to minimize light reflection and to increase contrast between the signal indication and its background. The dull black finish shall meet FS TT-E-527.

Replace Subarticle M.16.07-C-2 in its entirety with the following:

M.16.07—Pedestrian Signal:

2. LED: The optical unit shall consist of multiple LED light sources and a regulated power supply assembled as a sealed unit. The diodes shall be arranged to display a full-hand symbol side by side with a full pedestrian symbol. The optical unit shall fit into a standard pedestrian signal housing so that it may be installed into an existing incandescent pedestrian signal. The LED optical unit shall be capable of maintaining message symbol integrity despite any partial loss of LEDs. The beam color shall match that of the incandescent message: walking symbol - lunar white, hand - Portland orange. The beam pattern and intensity shall meet ITE specifications. The intensity may not degrade by more than 10% per annum. The optical unit shall be warranted by the manufacturer for a period of 5 years.

Electrical Requirements:

- Input Voltage: 89 VAC to 135 VAC
- Wattage: 15 Watts
- Input Impedance at 60 Hz must satisfy all conflict monitor requirements.
- A regulated power supply shall be engineered to protect the LEDs from electrical surges and transient voltages.

Replace Subarticles M.16.07-E and M.16.07-F with the following:

E. Hardware: All exposed screws and fasteners shall be stainless steel. All internal screws, fasteners and metal parts shall be stainless steel, non-corrosible materials; or cadmium-plated ferrous materials.

F. Painting: All surfaces of the signal housing, door, all brackets and hardware, and visors, inside and out, shall be finished with 3 coats of infrared-oven-baked paint applied by the manufacturer before assembly. All brackets and hardware shall be painted black by the manufacturer. The color shall be AMS-STD-595 Color No. 17038.

First Coat: The primer shall be iron oxide baking primer and shall meet or exceed the requirements

of FS TT-P-645.

Second Coat: Shall be light gray exterior baking enamel and shall meet the requirements of FS TT-E-489, No. 16251, No. 16314 or No. 16376 gray.

Third Coat: Shall be exterior-baking enamel and shall meet the requirements of FS A-A-2962.

The housing, housing door, outside of the visor, and all brackets and hardware shall be painted black by the manufacturer. The color shall be AMS-STD-595 Color No. 17038.

At intersections at Merritt Parkway interchanges, the housing, housing door, outside of visor, and all brackets and hardware shall be painted dark green by the manufacturer. The color shall be AMS-STD-595 Color No. 14056.

The inside of the visor shall have a dull black finish to minimize light reflection and to increase contrast between the signal indication and its background. The dull black finish shall meet FS TT-E-527.

In Article M.16.08, replace “push button” with “pushbutton” wherever it occurs and replace the “Painting” Subarticle with the following:

M.16.08—Pedestrian Pushbutton:

Painting: All surfaces of the unit shall be finished with 3 coats of infrared oven-baked paint applied by the manufacturer, before assembly.

First Coat: Primer, shall be iron oxide baking primer and shall meet or exceed performance specification of FS TT-P-664.

Second Coat: Gray Enamel, shall be lusterless and shall comply with FS TT-E-527.

Third Coat: Black Enamel, shall be BLACK exterior-baking enamel and shall meet the requirements of FS A-A 2962. The color shall be AMS-STD-595 Color No. 17038. At intersections at Merritt Parkway interchanges, the color shall be AMS-STD-595 Color No. 14062.

Replace Article M.16.13 with the following:

M.16.13—Vacant

In Article M.16.09, replace the “Painting” Subarticle with the following:

M.16.09—Controllers:

Painting: All outside surfaces of the cabinet and door shall be finished with 3 coats of infrared oven-baked paint before assembly.

First Coat: The primer shall be iron oxide baking primer and shall meet or exceed FS TT-P-636.

Second and Third Coats: The second and third coats will be aluminum paint meeting the requirements of FS TT-P-320, and Federal Test Method Standard 141. The color shall be AMS-STD-595 Color No. 17178.

Replace the next to last paragraph in Article M.16.17 with the following:

M.16.17—Illuminated Signs:

A weatherproof housing of the dimensions specified on the plans shall be provided to enclose the fiber optic module assembly with bifurcated output fiber bundles, color filters, light sources and transformers. The sign housing frame shall be manufactured from extruded aluminum, 6061-T6, ASTM B221. This assembly shall be provided with a hinged access door. The hinge shall be stainless steel piano type hinge mounted on the left side of the door. All external hardware shall be stainless steel, internal hardware shall be corrosion resistant. The housing shall have a minimum of four 1 inch diameter drainage holes. The entire front face of the sign shall be protected by a 1/8 inch thick sheet of clear polycarbonate mounted in the door frame. The housing shall be Federal Black according to AMS-STD-595 Color No. 17038 and the aluminum front panel shall be flat black according to AMS-STD-595 Color No. 37031 unless otherwise specified on the plans. At intersections at Merritt Parkway interchanges, the housing shall be AMS-STD-595 Color No. 14062. The complete sign assembly shall not weigh more than 150 pounds.

CONSTRUCTION CONTRACTS - REQUIRED CONTRACT PROVISIONS
(FHWA FUNDED CONTRACTS)

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 and Other Related Information (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. Specific Equal Employment Opportunity Responsibilities

The Contractor shall comply with the Specific Equal Employment Opportunity requirements, as applicable, attached at Exhibit C and hereby made part of this Contract.

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 817), 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 and Other Enactments

- (a) All references in this Contract to any Federal, State, or local law, statute, public or special act, executive order, ordinance, regulation or code (collectively, "Enactments") shall mean Enactments that apply to the Contract at any time during its term, or that may be made applicable to the Contract during its term. This Contract shall always be read and interpreted in accordance with the latest applicable wording and requirements of the Enactments. Unless otherwise provided by Enactments, the Contractor is not relieved of its obligation to perform under this Contract if it chooses to contest the applicability of the Enactments or the Client Agency's authority to require compliance with the Enactments.
- (b) This Contract is subject to the provisions of Executive Order No. Three of Governor Thomas J. Meskill, promulgated June 16, 1971, concerning labor employment practices, Executive Order No. Seventeen of Governor Thomas J. Meskill, promulgated February 15, 1973, concerning the listing of employment openings and Executive Order No. Sixteen of Governor John G. Rowland promulgated August 4, 1999, concerning violence in the workplace, all of which are incorporated into and are made a part of this Contract as if they had been fully set forth in it.
- (c) This Contract may be subject to (1) Executive Order No. 14 of Governor M. Jodi Rell, promulgated April 17, 2006, concerning procurement of cleaning products and services; and (2) Executive Order No. 61 of Governor Dannel P. Malloy promulgated December 13, 2017 concerning the Policy for the Management of State Information Technology Projects, as issued by the Office of Policy and Management, Policy ID IT-SDLC-17-04. If any of the Executive Orders referenced in this subsection is applicable, it is deemed to be incorporated into and made a part of this Contract as if fully set forth in it.

10. NonDiscrimination Requirement and Certification (pursuant to section 4a-60 and 4a-60a of the Connecticut General Statutes, as revised): References to "minority business enterprises" in this Section are not applicable to Federal-aid projects/contracts. Federal-aid projects/contracts are instead subject to the Federal Disadvantaged Business Enterprise Program.

- (a) For purposes of this Section, the following terms are defined as follows:
 - i. "Commission" means the Commission on Human Rights and Opportunities;
 - ii. "Contract" and "contract" include any extension or modification of the Contract or contract;
 - iii. "Contractor" and "contractor" include any successors or assigns of the Contractor or contractor;
 - iv. "Gender identity or expression" means a person's gender-related identity, appearance or behavior, whether or not that gender-related identity, appearance or behavior is different from that traditionally associated with the person's physiology or assigned sex at birth, which gender-related identity can be shown by providing evidence including, but not limited to, medical history, care or treatment of the gender-related

- identity, consistent and uniform assertion of the gender-related identity or any other evidence that the gender-related identity is sincerely held, part of a person's core identity or not being asserted for an improper purpose;
- v. "good faith" means that degree of diligence which a reasonable person would exercise in the performance of legal duties and obligations;
 - vi. "good faith efforts" shall include, but not be limited to, those reasonable initial efforts necessary to comply with statutory or regulatory requirements and additional or substituted efforts when it is determined that such initial efforts will not be sufficient to comply with such requirements;
 - vii. "marital status" means being single, married as recognized by the state of Connecticut, widowed, separated or divorced;
 - viii. "mental disability" means one or more mental disorders, as defined in the most recent edition of the American Psychiatric Association's "Diagnostic and Statistical Manual of Mental Disorders", or a record of or regarding a person as having one or more such disorders;
 - ix. "minority business enterprise" means any small contractor or supplier of materials fifty-one percent or more of the capital stock, if any, or assets of which is owned by a person or persons: (1) who are active in the daily affairs of the enterprise, (2) who have the power to direct the management and policies of the enterprise, and (3) who are members of a minority, as such term is defined in subsection (a) of Connecticut General Statutes § 32-9n; and
 - x. "public works contract" means any agreement between any individual, firm or corporation and the State or any political subdivision of the State other than a municipality for construction, rehabilitation, conversion, extension, demolition or repair of a public building, highway or other changes or improvements in real property, or which is financed in whole or in part by the State, including, but not limited to, matching expenditures, grants, loans, insurance or guarantees.

For purposes of this Section, the terms "Contract" and "contract" do not include a contract where each contractor is (1) a political subdivision of the state, including, but not limited to, a municipality, unless the contract is a municipal public works contract or quasi-public agency project contract, (2) any other state, including but not limited to any federally recognized Indian tribal governments, as defined in C.G.S. § 1-267, (3) the federal government, (4) a foreign government, or (5) an agency of a subdivision, state or government described in the immediately preceding enumerated items (1), (2), (3), or (4).

- (b) (1) The Contractor agrees and warrants that in the performance of the Contract such Contractor will not discriminate or permit discrimination against any person or group of persons on the grounds of race, color, religious creed, age, marital status, national origin, ancestry, sex, 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 ensure that applicants with job-related qualifications are employed and that employees are treated when employed without regard to their race, color, religious creed, age, marital status, national origin, ancestry, sex, gender identity or expression, 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.
- (i) Pursuant to subsection (c) of section 4a-60 and subsection (b) of section 4a-60a of the Connecticut General Statutes, the Contractor, for itself and its authorized signatory of this Contract, affirms that it understands the obligations of this section and that it will maintain a policy for the duration of the Contract to assure that the Contract will be performed in compliance with the nondiscrimination requirements of such sections. The Contractor and its authorized signatory of this Contract demonstrate their understanding of this obligation by (A) having provided an affirmative response in the required online bid or response to a proposal question which asks if the contractor understands its obligations under such sections, (B) signing this Contract, or (C) initialing this nondiscrimination affirmation in the following box:

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 (a) the State has provided to the Contractor the summary of State ethics laws developed by the State Ethics Commission pursuant to section 1-81b of the Connecticut General Statutes, which summary is incorporated by reference into and made a part of this Contract as if the summary had been fully set

forth in this Contract; (b) the Contractor represents that the chief executive officer or authorized signatory of the Contract and all key employees of such officer or signatory have read and understood the summary and agree to comply with the provisions of state ethics law; (c) prior to entering into a contract with any subcontractors or consultants, the Contractor shall provide the summary to all subcontractors and consultants and each such contract entered into with a subcontractor or consultant on or after July 1, 2021, shall include a representation that each subcontractor or consultant and the key employees of such subcontractor or consultant have read and understood the summary and agree to comply with the provisions of state ethics law; (d) failure to include such representations in such contracts with subcontractors or consultants shall be cause for termination of the Contract; and (e) each contract with such contractor, subcontractor or consultant shall incorporate such summary by reference as a part of the contract terms.

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 section 9-612 of the Connecticut General Statutes 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 represents

that they have received the State Elections Enforcement Commission’s notice advising state contractors of state campaign contribution and solicitation prohibitions, and will inform its principals of the contents of the notice.

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

- (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.

24. Sovereign Immunity

The parties acknowledge and agree that nothing in the Solicitation or the Contract shall be construed as a modification, compromise or waiver by the State of any rights or defenses of any immunities provided by Federal law or the laws of the State of Connecticut to the State or any of its officers and employees, which they may have had, now have or will have with respect to all matters arising out of the Contract. To the extent that this section conflicts with any other section, this section shall govern.

25. Large State Contract Representation for Contractor

Pursuant to section 4-252 of the Connecticut General Statutes and Acting Governor Susan Bysiewicz Executive Order No. 21-2, promulgated July 1, 2021, the Contractor, for itself and on behalf of all of its principals or key personnel who submitted a bid or proposal, represents:

- (1) That no gifts were made by (A) the Contractor, (B) any principals and key personnel of the Contractor, who participate substantially in preparing bids,

proposals or negotiating State contracts, or (C) any agent of the Contractor or principals and key personnel, who participates substantially in preparing bids, proposals or negotiating State contracts, to (i) any public official or State employee of the State agency or quasi- public agency soliciting bids or proposals for State contracts, who participates substantially in the preparation of bid solicitations or requests for proposals for State contracts or the negotiation or award of State contracts, or (ii) any public official or State employee of any other State agency, who has supervisory or appointing authority over such State agency or quasi-public agency;

(2) That no such principals and key personnel of the Contractor, or agent of the Contractor or of such principals and key personnel, knows of any action by the Contractor to circumvent such prohibition on gifts by providing for any other principals and key personnel, official, employee or agent of the Contractor to provide a gift to any such public official or State employee; and

(3) That the Contractor is submitting bids or proposals without fraud or collusion with any person.

26. Large State Contract Representation for Official or Employee of State Agency

Pursuant to section 4-252 of the Connecticut General Statutes and Acting Governor Susan Bysiewicz Executive Order No. 21-2, promulgated July 1, 2021, the State agency official or employee represents that the selection of the person, firm or corporation was not the result of collusion, the giving of a gift or the promise of a gift, compensation, fraud or inappropriate influence from any person.

27. Iran Investment Energy Certification

(a) Pursuant to section 4-252a of the Connecticut General Statutes, the Contractor certifies that it has not made a direct investment of twenty million dollars or more in the energy sector of Iran on or after October 1, 2013, as described in Section 202 of the Comprehensive Iran Sanctions, Accountability and Divestment Act of 2010, and has not increased or renewed such investment on or after said date.

(b) If the Contractor makes a good faith effort to determine whether it has made an investment described in subsection (a) of this section then the Contractor shall not be deemed to be in breach of the Contract or in violation of this section. A "good faith effort" for purposes of this subsection includes a determination that the Contractor is not on the list of persons who engage in certain investment activities in Iran created by the Department of General Services of the State of California pursuant to Division 2, Chapter 2.7 of the California Public Contract Code. Nothing in this subsection shall be construed to impair the ability of the State agency or quasi-public agency to pursue a breach of contract action for any violation of the provisions of the Contract.

28. Access to Contract and State Data

The Contractor shall provide to the Client Agency access to any data, as defined in Conn. Gen Stat.

Sec. 4e-1, concerning the Contract and the Client Agency that are in the possession or control of the Contractor upon demand and shall provide the data to the Client Agency in a format prescribed by the Client Agency and the State Auditors of Public Accounts at no additional cost.

29. Affirmative Action Policy Statement

The Contractor shall comply with the Affirmative Action Policy Statement, as applicable, attached at Exhibit E and hereby made part of this Contract.

30. Compliance with Consumer Data Privacy and Online Monitoring

Pursuant to section 4 of Public Act 23-16 of the Connecticut General Assembly, Contractor shall at all times comply with all applicable provisions of sections 42-515 to 42-525, inclusive, of the Connecticut General Statutes, as the same may be revised or modified.

EXHIBIT A

REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS

- I. General
- II. Nondiscrimination
- III. Non-segregated 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. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion
- XI. Certification Regarding Use of Contract Funds for Lobbying
- XII. Use of United States-Flag Vessels:

ATTACHMENTS

A. Employment and Materials Preference for Appalachian Development Highway System or Appalachian Local Access Road Contracts (included in Appalachian contracts only)

I. GENERAL

1. Form FHWA-1273 must be physically incorporated in each construction contract funded under title 23, United States Code, as required in 23 CFR 633.102(b) (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). 23 CFR 633.102(e).

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. 23 CFR 633.102(e).

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) in accordance with 23 CFR 633.102. 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 solicitation-for-bids or request-for-proposals 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). 23 CFR 633.102(b).

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. 23 CFR 633.102(d).

3. A breach of any of the stipulations contained in these Required Contract Provisions may be sufficient grounds for withholding of progress payments, withholding of final payment, termination of the contract, suspension / debarment or any other action determined to be appropriate by the contracting agency and FHWA.

4. Selection of Labor: During the performance of this contract, the contractor shall not use convict labor for any purpose within the limits of a construction project on a Federal-aid highway unless it is labor performed by convicts who are on parole, supervised release, or probation. 23 U.S.C. 114(b). The term Federal-aid highway does not include roadways functionally classified as local roads or rural minor collectors. 23 U.S.C. 101(a).

II. NONDISCRIMINATION (23 CFR 230.107(a); 23 CFR Part 230, Subpart A, Appendix A; EO 11246)

The provisions of this section related to 23 CFR Part 230, Subpart A, Appendix A 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 Part 60, 29 CFR Parts 1625-1627, 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; 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 Part 60, and 29 CFR Parts 1625-1627. The contracting agency and the FHWA have the authority and the responsibility to ensure compliance with 23 U.S.C. 140, Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), and Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d et seq.), and related regulations including 49 CFR Parts 21, 26, and 27; and 23 CFR Parts 200, 230, and 633.

The following provision is adopted from 23 CFR Part 230, Subpart A, 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 (see 28 CFR Part 35, 29 CFR Part 1630, 29 CFR Parts 1625-1627, 41 CFR Part 60 and 49 CFR Part 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 Part 35 and 29 CFR Part 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. 23 CFR 230.409 (g)(4) & (5).

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, sexual orientation, gender identity, 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 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 or other knowledgeable company official.

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, sexual orientation, gender identity, national origin, age or disability. The following procedures shall be followed:

a. The contractor will conduct periodic inspections of project sites to ensure 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. 23 CFR 230.409. 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, sexual orientation, gender identity, 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, sexual orientation, gender identity, 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 thereunder. 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, sexual orientation, gender identity, 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, 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. Assurances Required:

a. The requirements of 49 CFR Part 26 and the State DOT's FHWA-approved Disadvantaged Business Enterprise (DBE) program are incorporated by reference.

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

- (1) Withholding monthly progress payments;
- (2) Assessing sanctions;
- (3) Liquidated damages; and/or
- (4) Disqualifying the contractor from future bidding as non-responsible.

c. The Title VI and nondiscrimination provisions of U.S. DOT Order 1050.2A at Appendixes A and E are incorporated by reference. 49 CFR Part 21.

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 more than \$10,000. 41 CFR 60-1.5.

As prescribed by 41 CFR 60-1.8, 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, sexual orientation, gender identity, 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), in accordance with 29 CFR 5.5. The requirements apply to all projects located within the right-of-way of a roadway that is functionally classified as Federal-aid highway. 23 U.S.C. 113. This excludes roadways functionally classified as local roads or rural minor collectors, which are exempt. 23 U.S.C. 101. Where applicable law requires that projects be treated as a project on a Federal-aid highway, the provisions of this subpart will apply regardless of the location of the project. Examples include: Surface Transportation Block Grant Program projects funded under 23 U.S.C. 133 [excluding recreational trails projects], the Nationally Significant Freight and Highway

Projects funded under 23 U.S.C. 117, and National Highway Freight Program projects funded under 23 U.S.C. 167.

The following provisions are from the U.S. Department of Labor regulations in 29 CFR 5.5 "Contract provisions and related matters" with minor revisions to conform to the FHWA- 1273 format and FHWA program requirements.

1. Minimum wages (29 CFR 5.5)

a. 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, 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 Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(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 (29 CFR 5.5)

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 (29 CFR 5.5)

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. 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 29 CFR 5.5(a)(3)(ii), the appropriate information is being maintained under 29 CFR 5.5(a)(3)(i), 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 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 18 U.S.C. 1001 and 31 U.S.C. 231.

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 (29 CFR 5.5)

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. 29 CFR 230.111(e)(2). The straight time hourly wage rates for apprentices and trainees under such programs will be established by the particular programs. The ratio of apprentices and trainees to 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 as provided in 29 CFR 5.5.

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 as provided in 29 CFR 5.5.

9. Disputes concerning labor standards. As provided in 29 CFR 5.5, disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor

set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of eligibility (29 CFR 5.5)

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

Pursuant to 29 CFR 5.5(b), the following clauses apply to any Federal-aid construction contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by 29 CFR 5.5(a) or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include 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. 29 CFR 5.5.

2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph 1 of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. 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 currently provided in 29 CFR 5.5(b)(2)* for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph 1 of this section. 29 CFR 5.5.

* \$27 as of January 23, 2019 (See 84 FR 213-01, 218) as may be adjusted annually by the Department of Labor; pursuant to the Federal Civil Penalties Inflation Adjustment Act of 1990).

3. Withholding for unpaid wages and liquidated damages.

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. 29 CFR 5.5.

4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs 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. 29 CFR 5.5.

VI. SUBLETTING OR ASSIGNING THE CONTRACT

This provision is applicable to all Federal-aid construction contracts on the National Highway System pursuant to 23 CFR 635.116.

1. The contractor shall perform with its own organization contract work amounting to not less than 30 percent (or a greater percentage if specified elsewhere in the contract) of the total original contract price, excluding any specialty items designated by the contracting agency. Specialty items may be performed by subcontract and the amount of any such specialty items performed may be deducted from the total original contract price before computing the amount of work required to be performed by the contractor's own organization (23 CFR 635.116).

a. The term "perform work with its own organization" in paragraph 1 of Section VI refers to workers employed or leased by the prime contractor, and equipment owned or rented by the prime contractor, with or without operators. Such term does not include employees or equipment of a subcontractor or lower tier subcontractor, agents of the prime contractor, or any other assignees. The term may include payments for the costs of hiring leased employees from an employee leasing firm meeting all relevant Federal and State regulatory requirements. Leased employees may only be included in this term if the prime contractor meets all of the following conditions: (based on longstanding interpretation)

- (1) the prime contractor maintains control over the supervision of the day-to-day activities of the leased employees;
- (2) the prime contractor remains responsible for the quality of the work of the leased employees;
- (3) the prime contractor retains all power to accept or exclude individual employees from work on the project; and
- (4) the prime contractor remains ultimately responsible for the payment of predetermined minimum wages, the submission of payrolls, statements of compliance and all other Federal regulatory requirements.

b. "Specialty Items" shall be construed to be limited to work that requires highly specialized knowledge, abilities, or

equipment not ordinarily available in the type of contracting organizations qualified and expected to bid or propose on the contract as a whole and in general are to be limited to minor components of the overall contract. 23 CFR 635.102.

2. Pursuant to 23 CFR 635.116(a), the contract amount upon which the requirements set forth in paragraph (1) of 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. Pursuant to 23 CFR 635.116(c), the contractor shall furnish (a) a competent superintendent or supervisor who is employed by the firm, has full authority to direct performance of the work in accordance with the contract requirements, and is in charge of all construction operations (regardless of who performs the work) and (b) such other of its own organizational resources (supervision, management, and engineering services) as the contracting officer determines is necessary to assure the performance of the contract.

4. No portion of the contract shall be sublet, assigned or otherwise disposed of except with the written consent of the contracting officer, or authorized representative, and such consent when given shall not be construed to relieve the contractor of any responsibility for the fulfillment of the contract. Written consent will be given only after the contracting agency has assured that each subcontract is evidenced in writing and that it contains all pertinent provisions and requirements of the prime contract. (based on long-standing interpretation of 23 CFR 635.116).

5. The 30-percent self-performance requirement of paragraph (1) is not applicable to design-build contracts; however, contracting agencies may establish their own self-performance requirements. 23 CFR 635.116(d).

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 Part 635). The contractor shall provide all safeguards, safety devices and protective equipment and take any other needed actions as it determines, or as the contracting officer may determine, to be reasonably necessary to protect the life and health of employees on the job and the safety of the public and to protect property in connection with the performance of the work covered by the contract. 23 CFR 635.108.

2. It is a condition of this contract, and shall be made a condition of each subcontract, which the contractor enters into pursuant to this contract, that the contractor and any subcontractor shall not permit any employee, in performance of the contract, to work in surroundings or under conditions which are unsanitary, hazardous or dangerous to his/her health or safety, as determined under construction safety and health standards (29 CFR Part 1926) promulgated by the Secretary of Labor, in accordance with Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704). 29 CFR 1926.10.

3. Pursuant to 29 CFR 1926.3, it is a condition of this contract that the Secretary of Labor or authorized representative thereof, shall have right of entry to any site of contract performance to inspect or investigate the matter of compliance

with the construction safety and health standards and to carry out the duties of the Secretary under Section 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. 3704).

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 Part 635) in one or more places where it is readily available to all persons concerned with the project:

18 U.S.C. 1020 reads as follows:

"Whoever, being an officer, agent, or employee of the United States, or of any State or Territory, or whoever, whether a person, association, firm, or corporation, knowingly makes any false statement, false representation, or false report as to the character, quality, quantity, or cost of the material used or to be used, or the quantity or quality of the work performed or to be performed, or the cost thereof in connection with the submission of plans, maps, specifications, contracts, or costs of construction on any highway or related project submitted for approval to the Secretary of Transportation; or

Whoever knowingly makes any false statement, false representation, false report or false claim with respect to the character, quality, quantity, or cost of any work performed or to be performed, or materials furnished or to be furnished, in connection with the construction of any highway or related project approved by the Secretary of Transportation; or

Whoever knowingly makes any false statement or false representation as to material fact in any statement, certificate, or report submitted pursuant to provisions of the Federal-aid Roads Act approved July 11, 1916, (39 Stat. 355), as amended and supplemented;

Shall be fined under this title or imprisoned not more than 5 years or both."

IX. IMPLEMENTATION OF CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT (42 U.S.C. 7606; 2 CFR 200.88; EO 11738)

This provision is applicable to all Federal-aid construction contracts in excess of \$150,000 and to all related subcontracts. 48 CFR 2.101; 2 CFR 200.326.

By submission of this bid/proposal or the execution of this contract or subcontract, as appropriate, the bidder, proposer, Federal-aid construction contractor, subcontractor, supplier, or vendor agrees to comply with all applicable standards, orders

or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251-1387). Violations must be reported to the Federal Highway Administration and the Regional Office of the Environmental Protection Agency. 2 CFR Part 200, Appendix II.

The contractor agrees to include or cause to be included the requirements of this Section in every subcontract, and further agrees to take such action as the contracting agency may direct as a means of enforcing such requirements. 2 CFR 200.326.

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. 2 CFR 180.220 and 1200.220.

1. Instructions for Certification – First Tier Participants:

a. By signing and submitting this proposal, the prospective first tier participant is providing the certification set out below.

b. The inability of a person to provide the certification set out below will not necessarily result in denial of participation in this covered transaction. The prospective first tier participant shall submit an explanation of why it cannot provide the certification set out below. The certification or explanation will be considered in connection with the department or agency's determination whether to enter into this transaction. However, failure of the prospective first tier participant to furnish a certification or an explanation shall disqualify such a person from participation in this transaction. 2 CFR 180.320.

c. The certification in this clause is a material representation of fact upon which reliance was placed when the contracting agency determined to enter into this transaction. If it is later determined that the prospective participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the contracting agency may terminate this transaction for cause of default. 2 CFR 180.325.

d. The prospective first tier participant shall provide immediate written notice to the contracting agency to whom this proposal is submitted if any time the prospective first tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances. 2 CFR 180.345 and 180.350.

e. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900-180.1020, and 1200. "First Tier Covered Transactions" refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contract). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant

who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

f. The prospective first tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction. 2 CFR 180.330.

g. The prospective first tier participant further agrees by submitting this proposal that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions," provided by the department or contracting agency, entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold. 2 CFR 180.220 and 180.300.

h. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. 2 CFR 180.300; 180.320, and 180.325. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. 2 CFR 180.335. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (<https://www.sam.gov/>). 2 CFR 180.300, 180.320, and 180.325.

i. Nothing contained in the foregoing shall be construed to require the establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of the prospective participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

j. Except for transactions authorized under paragraph (f) of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency may terminate this transaction for cause or default. 2 CFR 180.325.

2. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion – First Tier Participants:

a. The prospective first tier participant certifies to the best of its knowledge and belief, that it and its principals:

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.335;.

(2) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property, 2 CFR 180.800;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (a)(2) of this certification, 2 CFR 180.700 and 180.800; and

(4) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default. 2 CFR 180.335(d).

(5) Are not a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(6) Are not a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability (USDOT Order 4200.6 implementing appropriations act requirements).

b. Where the prospective participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal. 2 CFR 180.335 and 180.340.

3. Instructions for Certification - Lower Tier Participants:

(Applicable to all subcontracts, purchase orders, and other lower tier transactions requiring prior FHWA approval or estimated to cost \$25,000 or more - 2 CFR Parts 180 and 1200). 2 CFR 180.220 and 1200.220.

a. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.

b. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department, or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

c. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous by reason of changed circumstances. 2 CFR 180.365.

d. The terms "covered transaction," "debarred," "suspended," "ineligible," "participant," "person," "principal," and "voluntarily excluded," as used in this clause, are defined in 2 CFR Parts 180, Subpart I, 180.900 – 180.1020, and 1200. You may contact the person to which this proposal is

submitted for assistance in obtaining a copy of those regulations. "First Tier Covered Transactions" refers to any covered transaction between a recipient or subrecipient of Federal funds and a participant (such as the prime or general contractor). "Lower Tier Covered Transactions" refers to any covered transaction under a First Tier Covered Transaction (such as subcontracts). "First Tier Participant" refers to the participant who has entered into a covered transaction with a recipient or subrecipient of Federal funds (such as the prime or general contractor). "Lower Tier Participant" refers any participant who has entered into a covered transaction with a First Tier Participant or other Lower Tier Participants (such as subcontractors and suppliers).

e. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency with which this transaction originated. 2 CFR 1200.220 and 1200.332.

f. The prospective lower tier participant further agrees by submitting this proposal that it will include this clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions exceeding the \$25,000 threshold. 2 CFR 180.220 and 1200.220.

g. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended, ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant is responsible for ensuring that its principals are not suspended, debarred, or otherwise ineligible to participate in covered transactions. To verify the eligibility of its principals, as well as the eligibility of any lower tier prospective participants, each participant may, but is not required to, check the System for Award Management website (<https://www.sam.gov/>), which is compiled by the General Services Administration. 2 CFR 180.300, 180.320, 180.330, and 180.335.

h. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

i. Except for transactions authorized under paragraph e of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment. 2 CFR 180.325.

* * * * *

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:

(a) is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participating in covered transactions by any Federal department or agency, 2 CFR 180.355;

(b) is a corporation that has been convicted of a felony violation under any Federal law within the two-year period preceding this proposal (USDOT Order 4200.6 implementing appropriations act requirements); and

(c) is a corporation with any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability. (USDOT Order 4200.6 implementing appropriations act requirements)

2. Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant should attach an explanation to this proposal.

* * * * *

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 Part 20, App. A.

1. The prospective participant certifies, by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

a. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

b. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any Federal agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

2. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

3. The prospective participant also agrees by submitting its bid or proposal that the participant shall require that the language of this certification be included in all lower tier

subcontracts, which exceed \$100,000 and that all such recipients shall certify and disclose accordingly.

USE OF UNITED STATES-FLAG VESSELS:

This provision is applicable to all Federal-aid construction contracts, design-build contracts, subcontracts, lower-tier subcontracts, purchase orders, lease agreements, or any other covered transaction. 46 CFR Part 381.

This requirement applies to material or equipment that is acquired for a specific Federal-aid highway project. 46 CFR 381.7. It is not applicable to goods or materials that come into inventories independent of an FHWA funded-contract.

When oceanic shipments (or shipments across the Great Lakes) are necessary for materials or equipment acquired for a specific Federal-aid construction project, the bidder, proposer, contractor, subcontractor, or vendor agrees:

To utilize privately owned United States-flag commercial vessels to ship at least 50 percent of the gross tonnage (computed separately for dry bulk carriers, dry cargo liners, and tankers) involved, whenever shipping any equipment, material, or commodities pursuant to this contract, to the extent such vessels are available at fair and reasonable rates for United States-flag commercial vessels. 46 CFR 381.7.

To furnish within 20 days following the date of loading for shipments originating within the United States or within 30 working days following the date of loading for shipments originating outside the United States, a legible copy of a rated, 'on-board' commercial ocean bill-of-lading in English for each shipment of cargo described in paragraph (b)(1) of this section to both the Contracting Officer (through the prime contractor in the case of subcontractor bills-of-lading) and to the Office of Cargo and Commercial Sealift (MAR-620), Maritime Administration, Washington, DC 20590. (MARAD requires copies of the ocean carrier's (master) bills of lading, certified onboard, dated, with rates and charges. These bills of lading may contain business sensitive information and therefore may be submitted directly to MARAD by the Ocean Transportation Intermediary on behalf of the contractor). 46 CFR 381.7.

ATTACHMENT A - EMPLOYMENT AND MATERIALS PREFERENCE FOR APPALACHIAN DEVELOPMENT HIGHWAY SYSTEM OR APPALACHIAN LOCAL ACCESS ROAD CONTRACTS (23 CFR 633, Subpart B, Appendix B) This provision is applicable to all Federal-aid projects funded under the Appalachian Regional Development Act of 1965.

During the performance of this contract, the contractor undertaking to do work which is, or reasonably may be, done as on-site work, shall give preference to qualified persons who regularly reside in the labor area as designated by the DOL wherein the contract work is situated, or the subregion, or the Appalachian counties of the State wherein the contract work is situated, except:

To the extent that qualified persons regularly residing in the area are not available.

For the reasonable needs of the contractor to employ supervisory or specially experienced personnel necessary to assure an efficient execution of the contract work.

For the obligation of the contractor to offer employment to present or former employees as the result of a lawful collective bargaining contract, provided that the number of nonresident persons employed under this subparagraph (1c) shall not exceed 20 percent of the total number of employees employed by the contractor on the contract work, except as provided in subparagraph (4) below.

The contractor shall place a job order with the State Employment Service indicating (a) the classifications of the laborers, mechanics and other employees required to perform the contract work, (b) the number of employees required in each classification, (c) the date on which the participant estimates such employees will be required, and (d) any other pertinent information required by the State Employment Service to complete the job order form. The job order may be placed with the State Employment Service in writing or by telephone. If during the course of the contract work, the information submitted by the contractor in the original job order is substantially modified, the participant shall promptly notify the State Employment Service.

The contractor shall give full consideration to all qualified job applicants referred to him by the State Employment Service. The contractor is not required to grant employment to any job applicants who, in his opinion, are not qualified to perform the classification of work required.

If, within one week following the placing of a job order by the contractor with the State Employment Service, the State Employment Service is unable to refer any qualified job applicants to the contractor, or less than the number requested, the State Employment Service will forward a certificate to the contractor indicating the unavailability of applicants. Such certificate shall be made a part of the contractor's permanent project records. Upon receipt of this certificate, the contractor may employ persons who do not normally reside in the labor area to fill positions covered by the certificate, notwithstanding the provisions of subparagraph (1c) above.

The provisions of 23 CFR 633.207(e) allow the contracting agency to provide a contractual preference for the use of mineral resource materials native to the Appalachian region. The contractor shall include the provisions of Sections 1 through 4 of this Attachment A in every subcontract for work which is, or reasonably may be, done as on-site work.

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
CONNECTICUT REQUIRED
SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES
July 2022

1. General:

a) Equal employment opportunity requirements not to discriminate and to take affirmative action to assure equal employment opportunity as required by Executive Order 11246, Executive Order 11375 are set forth in Required Contract Provisions (Form PR-1273 or 1316, as appropriate) and these Special Provisions which are imposed pursuant to Section 140 of Title 23 U.S.C., as established by Section 22 of the Federal-Aid Highway Act of 1968, 49 CFR Part 21, 4a-60a and 46a-68c to 46a-68f of the Connecticut General Statutes. The requirements set forth in these Special Provisions shall constitute the specific affirmative action requirements for project activities under this contract and supplement the equal employment opportunity requirements set forth in the Required Contract Provisions.

b) "Company" refers to any entity doing business with the Connecticut Department of Transportation and includes but is not limited to the following:

Contractors and Subcontractors
Consultants and Subconsultants
Suppliers of Materials and Vendors (where applicable)
Municipalities (where applicable)
Utilities (where applicable)

c) The Company will work with the Connecticut Department of Transportation (CTDOT) and the Federal Government in carrying out equal employment opportunity obligations and in their review of his/her activities under the contract.

d) The Company and all his/her subcontractors or subconsultants holding subcontracts not including material suppliers, of \$10,000 or more, will comply with the following minimum specific requirement activities of equal employment opportunity: (The equal employment opportunity requirements of Executive Order 11246, as set forth in volume 60, Chapter 4, Section 1, subsection 1 of the Federal-Aid Highway Program Manual, are applicable to material suppliers as well as contractors and subcontractors.) The company will include these requirements in every subcontract of \$10,000 or more with such modification of language as necessary to make them binding on the subcontractor or subconsultant.

e) CTDOT shall require each contractor with contracts of \$10,000 or more or who have fifty or more employees and are awarded a public works contract, to comply with all existing procedures of CTDOT's Contract Compliance Program.

2. Equal Employment Opportunity Policy:

a) Companies with contracts, agreements or purchase orders valued at \$10,000 or more or who have fifty or more employees are required to comply with the Affirmative Action contract requirements. By signing a contract with CTDOT the contractor's commits to complying with

federal and state requirements to provide equal employment opportunity to all persons without regard to their race, color, religion, creed, sex, gender identity or expression, marital status, age, national origin, ancestry, status as a veteran, intellectual disability, mental disability, learning disability or physical disability, including but not limited to blindness, unless such disability prevents performance of the work involved and to promote the full realization of equal employment opportunity through a positive and continuous efforts.

3. Project Workforce Utilization Goals:

These goals are applicable to all construction projects performed in the covered area work (whether the project is federal or state funded). 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.

a. Appendix A establishes the goals for minority and female utilization in all crafts statewide on all State Funded construction projects.

b. Appendix B establishes the goals for minority and female utilization in all crafts statewide on Federally assisted or funded construction projects.

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 participation are expressed in percentage terms for the contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Federal Utilization Goals

See Appendix A

4. 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 Plan does not excuse any covered Contractor's or 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 Contractor's 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 workforce utilization 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 CTDOT 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 that which expressly target 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.
- g) Review at least annually, the company EEO Policy and affirmative action obligations with all employees having any responsibility for hiring, assignments, layoffs, terminations, or other employment decisions, 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 project worksite and in other areas of the Contractor's workforce.
- 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 opportunities through appropriate training 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 nonsegregated 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 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 so as to achieve maximum results from its efforts to ensure equal employment opportunity.

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.

5. Subcontracting:

- a. The Company will use his/her best efforts to solicit bids from and to utilize minority group subcontractors or subcontractors with meaningful minority group and female representation among their employees. Companies shall obtain lists of minority-owned construction firms from the Office of Equity.

- b. The Company will use its best efforts to ensure subcontractor compliance with their equal employment opportunity obligations.

6. Records and Reports:

- a. The Company will keep such records as are necessary to determine compliance with equal employment opportunity obligations. The records kept by the Company will be designed to indicate:
 - 1. The number of minority and non-minority group members and women employed in each classification on the project.
 - 2. The progress and efforts being made in cooperation with unions to increase employment opportunities for minorities and women; (applicable only to contractors who rely in whole or in part on unions as a source of their work force),
 - 3. The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and
 - 4. The progress and efforts being made in securing the services of minority group subcontractors or subcontractors with meaningful minority and female representation among their employees.
 - 5. Records of internal and external communication and outreach to document its affirmative efforts.

- b. All such records must be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of CTDOT and/or the United States Department of Transportation.

c. For Federal Highway Administration funded projects only:

The Company will submit an annual report to CTDOT each July or as otherwise directed, for the duration of the project, indicating the number of minorities, 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 PR 1391. If on-the-job training is being required by “Training Special Provision”, the Company will be required to furnish Form FHWA 1409 and 1415 as required by CTDOT.

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%
6.9%			
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
Killigly	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 in necessary to amend this Section of the Contract from time to time as is necessary for Covered Entity to comply with requirements of the Privacy Rule and the Health Insurance Portability and Accountability Act of 1996, Pub. L. No. 104-191.
- (3) Survival. The respective rights and obligations of Business Associate shall survive the termination of this Contract.
- (4) Effect on Contract. Except as specifically required to implement the purposes of this Section of the Contract, all other terms of the Contract shall remain in force and effect.
- (5) Construction. This Section of the Contract shall be construed as broadly as necessary to implement and comply with the Privacy Standard. Any ambiguity in this Section of the Contract shall be resolved in favor of a meaning that complies, and is consistent with, the Privacy Standard.
- (6) Disclaimer. Covered Entity makes no warranty or representation that compliance with this Section of the Contract will be adequate or satisfactory for Business Associate's own purposes. Covered Entity shall not be liable to Business Associate for any claim, civil or criminal penalty, loss or damage related to or arising from the unauthorized use or disclosure of PHI by Business Associate or any of its officers, directors, employees, contractors or agents, or any third party to whom Business Associate has disclosed PHI contrary to the provisions of this Contract or applicable law. Business Associate is solely responsible for all decisions made, and actions taken, by Business Associate regarding the safeguarding, use and disclosure of PHI within its possession, custody or control.
- (7) Indemnification. The Business Associate shall indemnify and hold the Covered Entity harmless from and against any and all claims, liabilities, judgments, fines, assessments, penalties, awards and any statutory damages that may be imposed or assessed pursuant to HIPAA, as amended or the HITECH Act, including, without limitation, attorney's fees, expert witness fees, costs of investigation, litigation or dispute resolution, and costs awarded thereunder, relating to or arising out of any violation by the Business Associate and its agents, including subcontractors, of any obligation of Business Associate and its agents, including subcontractors, under this section of the contract, under HIPAA, the HITECH Act, the Privacy Rule and the Security Rule.

EXHIBIT E
AFFIRMATIVE ACTION POLICY STATEMENT (July 2022)

It is the policy of this firm to assure that applicants are employed, and that employees are treated during employment, without regard to an individual's race, color, religion, creed, sex, gender identity or expression, marital status, national origin, age, ancestry, status as a veteran, intellectual disability, mental disability, learning disability or physical disability, including but not limited to blindness, unless such disability prevents performance of the work involved and to promote the full realization of equal employment opportunity through positive and continuous affirmative efforts. Such action shall include employment, promotion, demotion or transfer, recruitment or recruitment advertising, layoff or terminations, rates of pay or other forms of compensation, selection for training/apprenticeship, pre-apprenticeship opportunities, and on-the-job training opportunities.

This firm will implement, monitor, enforce and achieve full compliance with this Affirmative Action Policy Statement in conjunction with the applicable Federal and State laws, regulations, executive orders, and contract provisions, including but not limited to those listed below:

Dissemination of Policy:

All members of the firm who are authorized to hire, supervise, promote, and discharge employees, or who recommend such action, or who are substantially involved in such action, will be made fully cognizant of, and will implement, this firm's Equal Employment Opportunity (EEO) policy and contractual responsibilities to provide EEO in each grade and classification of employment. These actions shall include:

1. Periodic meetings of supervisory and personnel office employees will be conducted before the start of work and then not less often than once every six months, at which time the firm's EEO policy and its implementation will be reviewed and explained. These meetings will be conducted by the EEO officer.
2. All new supervisory or personnel office employees will be given a thorough indoctrination by the EEO Officer, covering all major aspects of the contractor's EEO obligations within thirty days following their reporting for duty with the contractor.
3. All personnel who are engaged in direct recruitment for the firm will be instructed by the EEO Officer of the contractor's procedures for locating and hiring minority group employees.
4. Notices and posters setting forth the firm's EEO policy will be placed in areas readily accessible to employees, applicants for employment and potential employees.
5. The firm's EEO policy and the procedures to implement such policy will be brought to the attention of employees by means of meetings, employee handbooks, or other appropriate means.
6. Sexual Harassment Prevention Resources including training and remedies must be available to all employees. See Connecticut General Assembly Public Acts 19-16 and 19-93.

Recruitment:

When advertising for employees, the firm will include in all advertisements the notation; "An Affirmative Action/Equal Opportunity Employer." All such advertisements will be placed in

publications having a large circulation among minority groups in the area where the workforce would normally be derived.

1. The firm will, unless precluded by a valid bargaining agreement, conduct systematic and direct recruitment through public and private employee referral sources likely to yield qualified minority and female applicants. To meet this requirement, the firm will identify referral sources and establish procedures for recruitment to obtain the referral of minority and female applicants.
2. In the event the firm has a valid bargaining agreement providing for exclusive hiring referrals, he/she is expected to observe the provisions of that agreement to the extent that the system permits the contractor's compliance with EEO contract provisions. (The United States Department of Labor has held that where implementation of such agreements has had the effect of discriminating against minorities or women, or obligates the contractor to do the same, such implementation violates Executive Order 11246, as amended.)
3. The firm will encourage his/her present employees to refer minority group applicants for employment. Information and procedures with regard to referring minority group applicants will be discussed with employees.

Personnel Actions:

Wages, working conditions, and employee benefits shall be established and administered, and personnel actions of every type, including hiring, upgrading, promotion, transfer, demotion, layoff, and termination, shall be taken without regard to an individual's race, color, religion, creed, sex, gender identity or expression, marital status, national origin, age, ancestry, status as a veteran, intellectual disability, mental disability, learning disability or physical disability, including but not limited to blindness, unless such disability prevents performance of the work involved. The following procedures shall be followed:

1. The firm will conduct periodic inspections of project sites to insure that working conditions and employee facilities do not indicate discriminatory treatment of personnel.
2. The firm will periodically review selected personnel actions in depth to determine whether there is evidence of discrimination. Where evidence is found, the contractor will promptly take correction action. If the review indicates that the discrimination may extend beyond the actions reviewed, such corrective action shall include all affected persons.
3. The firm shall periodically evaluate the spread of wages paid within each classification to determine any evidence of discriminatory wage practices.
4. The firm will promptly investigate all complaints of alleged discrimination made to the firm and will take appropriate corrective action within a reasonable time. If the investigation indicates that the discrimination may affect persons other than the complainant, such corrective actions shall include such other persons. Upon completion of each investigation, the contractor will inform every complainant of all of his avenues of appeal.

Training and Promotion:

The firm will assist in locating, qualifying, and increasing the skills of minorities and women. The firm will utilize the following tools to identify training and promotional opportunities in the firm:

1. The firm will advise employees and applicants for employment of available training programs and the entrance requirements.
2. The firm will periodically review the training and promotion of minority group and female employees and will encourage eligible employees to apply for such training and promotion.

Unions:

If the firm relies in whole or in part upon unions as a source of employees, the contractor will use his/her best efforts to obtain the cooperation of such unions to increase opportunities for minority groups and women within the unions, and to effect referrals by such unions of minority and female employees. Actions by the firm either directly or through a contractor's association acting as agent will include the procedures set forth below:

1. The firm will use best efforts to develop, in cooperation with the unions, joint training programs aimed toward qualifying more minority group members and women for membership in the unions and increasing the skills of minority group employees and women so that they may qualify for higher paying employment.
2. The firm will use best efforts to incorporate an EEO clause into each union agreement to the extent that such union will be contractually bound to refer applicants without regard to their to an individual's race, color, religion, creed, sex, gender identity or expression, marital status, national origin, age, ancestry, status as a veteran, intellectual disability, mental disability, learning disability or physical disability, including but not limited to blindness, unless such disability prevents performance of the work involved.
3. The firm is to obtain information as to the referral practices and policies of the labor union except that to the extent that such information is within the exclusive possession of the labor union and such labor union refuses to furnish the information to the contractor, the contractor shall notify the Connecticut Department of Transportation (CTDOT) of the efforts made to obtain the information.
4. In the event the union is unable to provide the firm with a reasonable flow of minority and women referrals within the time limit set forth in the collective bargaining agreement, the contractor will, through independent recruitment efforts, fill the employment vacancies. (The United States Department of Labor has held that it shall be no excuse that the union with which the contractor has a collective bargaining agreement providing for exclusive referral failed to refer minority employees.) In the event the union referral practice prevents the contractor from meeting the obligations under Executive Order 11246 as amended, and in compliance with 23 CFR Part 230, the firm will notify CTDOT.

Selection of Subcontractors:

The firm will not discriminate on the grounds race, color, religion, sex, sexual orientation, gender identity or expression, marital status, national origin, ancestry, age, intellectual disability, learning disability, physical disability, including, but not limited to, blindness, or status as a veteran in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

1. The firm shall use his/her best efforts to ensure subcontractor/subconsultant compliance with Federal and State Equal Opportunity (EO) and EEO requirements.

Records and Reports:

The Contractor shall keep records as necessary to document compliance with EO/EEO requirements. Such reports shall be retained for a period of three years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of CTDOT and/or the United States Department of Transportation. The following records should be maintained:

6. The number of minority and non-minority group members and women employed in each work classification;
7. The progress and efforts being made in cooperation with unions, when applicable to increase the employment opportunities for minorities and women;
8. The documentation showing progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority and female employees; and
9. Complaints of Discrimination.

In implementing this policy and ensuring that affirmative action is being provided, each time a hiring opportunity occurs this firm will contact and request referrals from minority and female organizations, referral sources, and media sources. All advertising will emphasize that the firm is “An Affirmative Action/Equal Opportunity Employer.”

In order to substantiate this firm’s efforts and affirmative actions to provide equal opportunity, the firm will maintain and submit, as requested, documentation such as referral request correspondence, copies of advertisements utilized and follow-up documentation to substantiate that efforts were made in good faith. This firm will maintain the necessary internal audit procedures and record keeping systems to report the firm’s affirmative action efforts.

It is understood by Owner/CEO/President of the firm and the firm’s Equal Employment Opportunity Officer and supervisory and managerial personnel that failure to effectively implement, monitor and enforce this firm’s affirmative action program and/or failure to adequately document and submit as required, the affirmative actions taken and efforts made to recruit and hire minority and female applicants in accordance with our affirmative action program in each instance of hire, will result in this firm being required to recommit itself to a modified and more stringent affirmative action program as a condition of approval. It is recognized that this policy is a contractual requirement and is a prerequisite for performing services for the contracting agency. This policy in addition to CTDOT’s EO/EEO contract provisions and requirements, shall constitute the CTDOT Affirmative Program requirements.

The ultimate responsibility for the full implementation of this firm’s Affirmative Action Program rests with the Chief Executive Officer of this firm.

EXHIBIT F

(Federal wage rate package will be inserted at the end after State wages for the final executed contract only. Refer to NTC – Federal Wage Determinations)

EXHIBIT G
State Wages and Other Related Information

Please refer to the Department of Labor website for the latest updates, annual adjusted wage rate increases, certified payroll forms and applicable statutes.

<http://www.ctdol.state.ct.us/wgwkstnd/prevailwage.htm>

Prevailing Wage Law Poster Language

**THIS IS A PUBLIC WORKS PROJECT Covered by the
PREVAILING WAGE LAW CT General Statutes Section 31-53**

If you have QUESTIONS regarding your wages CALL (860) 263-6790

Section 31-55 of the CT State Statutes requires every contractor or subcontractor performing work for the state to post in a prominent place the prevailing wages as determined by the Labor Commissioner.

Informational Bulletin

THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE (applicable to public building contracts entered into on or after July 1, 2007, where the total cost of all work to be performed is at least \$100,000)

- (1) This requirement was created by Public Act No. 06-175, which is codified in Section 31-53b of the Connecticut General Statutes (pertaining to the prevailing wage statutes);
- (2) The course is required for public building construction contracts (projects funded in whole or in part by the state or any political subdivision of the state) entered into on or after July 1, 2007;
- (3) It is required of private employees (not state or municipal employees) and apprentices who perform manual labor for a general contractor or subcontractor on a public building project where the total cost of all work to be performed is at least \$100,000;
- (4) The ten-hour construction course pertains to the ten-hour Outreach Course conducted in accordance with federal OSHA Training Institute standards, and, for telecommunications workers, a ten-hour training course conducted in accordance with federal OSHA standard, 29 CFR 1910.268;
- (5) The internet website for the federal OSHA Training Institute is http://www.osha.gov/fso/ote/training/edcenters/fact_sheet.html;

- (6) The statutory language leaves it to the contractor and its employees to determine who pays for the cost of the ten-hour Outreach Course;
- (7) Within 30 days of receiving a contract award, a general contractor must furnish proof to the Labor Commissioner that all employees and apprentices performing manual labor on the project will have completed such a course;
- (8) Proof of completion may be demonstrated through either: (a) the presentation of a bona fide student course completion card issued by the federal OSHA Training Institute; or (2) the presentation of documentation provided to an employee by a trainer certified by the Institute pending the actual issuance of the completion card;
- (9) Any card with an issuance date more than 5 years prior to the commencement date of the construction project shall not constitute proof of compliance;
- (10) Each employer shall affix a copy of the construction safety course completion card to the certified payroll submitted to the contracting agency in accordance with Conn. Gen. Stat. § 31-53(f) on which such employee's name first appears;
- (11) Any employee found to be in non-compliance shall be subject to removal from the worksite if such employee does not provide satisfactory proof of course completion to the Labor Commissioner by the fifteenth day after the date the employee is determined to be in 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.

November 29, 2006

Notice

To All Mason Contractors and Interested Parties Regarding Construction Pursuant to Section 31-53 of the Connecticut General Statutes (Prevailing Wage)

The Connecticut Labor Department Wage and Workplace Standards Division is empowered to enforce the prevailing wage rates on projects covered by the above referenced statute. Over the past few years the Division has withheld enforcement of the rate in effect for workers who operate a forklift on a prevailing wage rate project due to a potential jurisdictional dispute. The rate listed in the schedules and in our Occupational Bulletin (see enclosed) has been as follows:

Forklift Operator:

- **Laborers (Group 4) Mason Tenders** - operates forklift solely to assist a mason to a maximum height of nine feet only.
- **Power Equipment Operator (Group 9)** - operates forklift to assist any trade and to assist a mason to a height over nine feet.

The U.S. Labor Department conducted a survey of rates in Connecticut but it has not been published and the rate in effect remains as outlined in the above Occupational Bulletin.

Since this is a classification matter and not one of jurisdiction, effective January 1, 2007 the Connecticut Labor Department will enforce the rate on each schedule in accordance with our statutory authority.

Your cooperation in filing appropriate and accurate certified payrolls is appreciated.

**CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION**

**CONTRACTORS WAGE CERTIFICATION FORM
Construction Manager at Risk/General Contractor/Prime Contractor**

I, _____ of _____
Officer, Owner, Authorized Rep. Company Name

do hereby certify that the _____
Company Name

Street

City

and all of its subcontractors will pay all workers on the

Project Name and Number

Street and City

the wages as listed in the schedule of prevailing rates required for such project (a copy of which is attached hereto).

Signed

Subscribed and sworn to before me this _____ day of _____, _____.

Notary Public

Return to: Connecticut Department of Labor
Wage & Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109

Rate Schedule Issued (Date): _____

Information Bulletin ***Occupational Classifications***

The Connecticut Department of Labor has the responsibility to properly determine "job classification" on prevailing wage projects covered under C.G.S. Section 31-53(d).

Note: This information is intended to provide a sample of some occupational classifications for guidance purposes only. It is not an all-inclusive list of each occupation's duties. This list is being provided only to highlight some areas where a contractor may be unclear regarding the proper classification. If unsure, the employer should seek guidelines for CTDOL.

Below are additional clarifications of specific job duties performed for certain classifications:

□ **ASBESTOS WORKERS**

Applies all insulating materials, protective coverings, coatings and finishes to all types of mechanical systems.

□ **ASBESTOS INSULATOR**

Handle, install apply, fabricate, distribute, prepare, alter, repair, dismantle, heat and frost insulation, including penetration and fire stopping work on all penetration fire stop systems.

□ **BOILERMAKERS**

Erects hydro plants, incomplete vessels, steel stacks, storage tanks for water, fuel, etc. Builds incomplete boilers, repairs heat exchanges and steam generators.

□ **BRICKLAYERS, CEMENT MASONS, CEMENT FINISHERS, MARBLE MASONS, PLASTERERS, STONE MASONS, PLASTERERS. STONE MASONS, TERRAZZO WORKERS, TILE SETTERS**

Lays building materials such as brick, structural tile and concrete cinder, glass, gypsum, terra cotta block. Cuts, tools and sets marble, sets stone, finishes concrete, applies decorative steel, aluminum and plastic tile, applies cements, sand, pigment and marble chips to floors, stairways, etc.

□ **CARPENTERS, MILLWRIGHTS. PILEDRIVERMEN. LATHERS. RESILEINT FLOOR LAYERS, DOCK BUILDERS, DIKERS, DIVER TENDERS**

Constructs, erects, installs and repairs structures and fixtures of wood, plywood and wallboard. Installs, assembles, dismantles, moves industrial machinery. Drives piling into ground to provide foundations for structures such as buildings and bridges, retaining walls for earth embankments, such as cofferdams. Fastens wooden, metal or rockboard lath to walls, ceilings and partitions of buildings, acoustical tile layer, concrete form builder. Applies firestopping materials on fire resistive joint systems only. Installation of curtain/window walls only where attached to wood or metal studs. Installation of insulated material of all types whether blown, nailed or attached in other ways to walls, ceilings and floors of buildings. Assembly and installation of modular furniture/furniture systems. Free-standing furniture is not covered. This includes free standing: student chairs, study top desks, book box desks, computer furniture, dictionary stand, atlas stand, wood shelving, two-position information access station, file cabinets, storage cabinets, tables, etc.

□ **LABORER, CLEANING**

- The clean up of any construction debris and the general (heavy/light) cleaning, including sweeping, wash down, mopping, wiping of the construction facility and its furniture, washing, polishing, and dusting.

□ **DELIVERY PERSONNEL**

- If delivery of supplies/building materials is to one common point and stockpiled there, prevailing wages are not required. If the delivery personnel are involved in the distribution of the material to multiple locations within the construction site then they would have to be paid prevailing wages for the type of work performed: laborer, equipment operator, electrician, ironworker, plumber, etc.

- An example of this would be where delivery of drywall is made to a building and the delivery personnel distribute the drywall from one "stockpile" location to further sub-locations on each floor. Distribution of material around a construction site is the job of a laborer or tradesman, and not a delivery personnel.

□ **ELECTRICIANS**

Install, erect, maintenance, alteration or repair of any wire, cable, conduit, etc., which generates, transforms, transmits or uses electrical energy for light, heat, power or other purposes, including the Installation or maintenance of telecommunication, LAN wiring or computer equipment, and low voltage wiring. *License required per Connecticut General Statutes: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9.

□ **ELEVATOR CONSTRUCTORS**

Install, erect, maintenance and repair of all types of elevators, escalators, dumb waiters and moving walks. *License required by Connecticut General Statutes: R-1, 2, 5, 6.

□ **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 J1,2,3,4 SP-1,2 S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4.

□ **POWER EQUIPMENT OPERATORS**

Operates several types of power construction equipment such as compressors, pumps, hoists, derricks, cranes, shovels, tractors, scrapers or motor graders, etc. Repairs and maintains equipment. *License required, crane operators only, per Connecticut General Statutes.

□ **ROOFERS**

Covers roofs with composition shingles or sheets, wood shingles, slate or asphalt and gravel to waterproof roofs, including preparation of surface. (demolition or removal of any type of roofing and or clean-up of any and all areas where a roof is to be relaid.)

□ **SHEETMETAL WORKERS**

Fabricate, assembles, installs and repairs sheetmetal products and equipment in such areas as ventilation, air-conditioning, warm air heating, restaurant equipment, architectural sheet metal work, sheetmetal roofing, and aluminum gutters. Fabrication, handling, assembling, erecting, altering, repairing, etc. of coated metal material panels and composite metal material panels when used on building exteriors and interiors as soffits, facia, louvers, partitions, canopies, cornice, column covers, awnings, beam covers, cladding, sun shades, lighting troughs, spires, ornamental roofing, metal ceilings, mansards, copings, ornamental and ventilation hoods, vertical and horizontal siding panels, trim, etc. The sheet metal classification also applies to the vast variety of coated metal material panels and composite metal material panels that have evolved over the years as an alternative to conventional ferrous and non-ferrous metals like steel, iron, tin, copper, brass, bronze, aluminum, etc. Fabrication, handling, assembling, erecting, altering, repairing, etc. of architectural metal roof, standing seam roof, composite metal roof, metal and composite bathroom/toilet partitions, aluminum gutters, metal and composite lockers and shelving, kitchen equipment, and walk-in coolers. To include testing and air –balancing ancillary to installation and construction.

□ **SPRINKLER FITTERS**

Installation, alteration, maintenance and repair of fire protection sprinkler systems. ***License required per Connecticut General Statutes: F-1, 2, 3, 4.**

□ **TILE MARBLE AND TERRAZZO FINISHERS**

Assists and tends the tile setter, marble mason and terrazzo worker in the performance of their duties.

□ **TRUCK DRIVERS**

~How to pay truck drivers delivering asphalt is under REVISION~

Truck Drivers are requires to be paid prevailing wage for time spent "working" directly on the site. These drivers remain covered by the prevailing wage for any time spent transporting between the actual construction location and facilities (such as fabrication, plants, mobile factories, batch plant, borrow pits, job headquarters, tool yards, etc.) dedicated exclusively, or nearly so, to performance of the contract or project, which are so located in proximity to the actual construction location that it is reasonable to include them. ***License required, drivers only, per Connecticut General Statutes.**

For example:

- Material men and deliverymen are not covered under prevailing wage as long as they are not directly involved in the construction process. If, they unload the material, they would then be covered by prevailing wage for the classification they are performing work in: laborer, equipment operator, etc.
- Hauling material off site is not covered provided they are not dumping it at a location outlined above.
- Driving a truck on site and moving equipment or materials on site would be considered covered work, as this is part of the construction process.

- Any questions regarding the proper classification should be directed to:

**Public Contract Compliance Unit
Wage and Workplace Standards Division
Connecticut Department of Labor
200 Folly Brook Blvd, Wethersfield, CT 06109
(860) 263-6543.**

**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.

SEE BELOW FOR STATE WAGE RATES

INSERT STATE WAGES HERE

Minimum Rates and Classifications for Heavy/Highway Construction

ID#: 24-59963

**Connecticut Department of Labor
Wage and Workplace Standards**

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: 0017-0192

Project Town: Bristol

State#:

FAP#:

Project: Replacement of Bridge No. 04487 East Street over Pequabuck River

CLASSIFICATION	Hourly Rate	Benefits
1) Boilermaker	46.21	29.35
1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	41.63	34.50
2) Carpenters, Piledrivermen	37.61	27.61
2a) Diver Tenders	37.61	27.61
3) Divers	46.07	27.61
03a) Millwrights	40.56	28.87
4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	56.25	25.15
4a) Painters: Brush and Roller	37.62	24.55
4b) Painters: Spray Only	40.62	24.55

As of: March 27, 2024

4c) Painters: Steel Only	39.62	24.55
4d) Painters: Blast and Spray	40.62	24.55
4e) Painters: Tanks, Tower and Swing	39.62	24.55
4f) Elevated Tanks (60 feet and above)	46.62	24.55
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)	42.6	33.21+3% of gross wage
6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection	42.37	40.02 + 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)	48.28	35.50
----LABORERS----		
8) Group 1: General Laborers and concrete specialist	33.5	25.59
8) Group 1a: Acetylene Burners (Hours worked with a torch)	34.5	25.59
9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen	33.75	25.59
10) Group 3: Pipelayers	34.0	25.59
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	34.0	25.59

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12) Group 5: Toxic waste removal (non-mechanical systems)	35.5	25.59
13) Group 6: Blasters	35.25	25.59
Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)	36.5	25.59
Group 8: Traffic control signalmen	20.1	25.59
Group 9: Hydraulic Drills	34.25	25.59
Group 10: Toxic Waste Removers A or B With PPE	36.5	25.59
----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	35.73	25.59 + a
13b) Brakemen, Trackmen, Miners' Helpers and all other men	34.76	25.59 + a
----CLEANING, CONCRETE AND CAULKING TUNNEL----		
14) Concrete Workers, Form Movers, and Strippers	34.76	25.59 + a
15) Form Erectors	35.09	25.59 + a
----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL IN FREE AIR:----		

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16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers, Miners Helpers	34.76	25.59 + a
17) Laborers Topside, Cage Tenders, Bellman	34.65	25.59 + a
18) Miners	35.73	25.59 + a
----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR: ----		
18a) Blaster	42.22	25.59 + a
19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	42.02	25.59 + a
20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	40.04	25.59 + a
21) Mucking Machine Operator, Grout Boss, Track Boss	42.81	25.59 + a
----TRUCK DRIVERS----(*see note below)		
Two Axle Trucks, Helpers	32.16	30.51 + a
Three Axle Trucks; Two Axle Ready Mix	32.27	30.51 + a
Three Axle Ready Mix	32.33	30.51 + a
Four Axle Trucks	32.39	30.51 + a
Four Axle Ready-Mix	32.44	30.51 + a

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Heavy Duty Trailer (40 tons and over)	34.66	30.51 + a
Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids)	32.44	30.51 + a
Heavy Duty Trailer (up to 40 tons)	33.39	30.51 + a
Snorkle Truck	32.54	30.51 + a
----POWER EQUIPMENT OPERATORS----		
Group 1: Crane Handling or Erecting Structural Steel or Stone, Hoisting Engineer (2 drums or over). (Trade License Required)	52.78	27.80 + a
Group 1a: Front End Loader (7 cubic yards or over); Work Boat 26 ft. and over.	48.37	27.80 + a
Group 2: Cranes (100 ton rate capacity and over); Bauer Drill/Caisson. (Trade License Required)	52.41	27.80 + a
Group 2a: Cranes (under 100 ton rated capacity).	51.51	27.80 + a
Group 2b: Excavator over 2 cubic yards; Pile Driver (\$3.00 premium when operator controls hammer).	48.0	27.80 + a
Group 3: Excavator; Gradall; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar); Grader Operator; Bulldozer Fine Grade (slopes, shaping, laser or GPS, etc.). (Trade License Required)	47.1	27.80 + a
Group 4: Trenching Machines; Lighter Derrick; CMI Machine or Similar; Koehring Loader (Skooper).	46.64	27.80 + a
Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Spreader; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps;	45.92	27.80 + a

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Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24" mandrel)

Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller. 45.92 27.80 + a

Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer). 45.55 27.80 + 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) 45.14 27.80 + a

Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine. 44.67 27.80 + 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), Vacuum Excavation Truck and Hydrovac Excavation Truck (27 HG pressure or greater). 44.14 27.80 + a

Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc. 41.69 27.80 + a

Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment. 41.69 27.80 + a

Group 12: Wellpoint Operator. 41.61 27.80 + a

Group 13: Compressor Battery Operator. 40.92 27.80 + a

Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain). 39.54 27.80 + a

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Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	39.06	27.80 + a
Group 16: Maintenance Engineer.	38.28	27.80 + a
Group 17: Portable Asphalt Plant Operator; Portable Crusher Plant Operator; Portable Concrete Plant Operator., Portable Grout Plant Operator, Portable Water Filtration Plant Operator.	43.46	27.80 + a
Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).	40.54	27.80 + a

****NOTE: SEE BELOW**

----LINE CONSTRUCTION----(Railroad Construction and Maintenance)----

20) Lineman, Cable Splicer, Technician	48.36	16.92
21) Heavy Equipment Operator	42.26	6.5% + 19.88
22) Equipment Operator, Tractor Trailer Driver, Material Men	40.96	6.5% + 19.21
23) Driver Groundmen	26.5	6.5% + 9.00
23a) Truck Driver	40.96	6.5% + 17.76

----LINE CONSTRUCTION----

24) Driver Groundmen	30.92	6.5% + 9.70
25) Groundmen	22.67	6.5% + 6.20

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26) Heavy Equipment Operators	37.1	6.5% + 10.70
27) Linemen, Cable Splicers, Dynamite Men	41.22	6.5% + 12.20
28) Material Men, Tractor Trailer Drivers, Equipment Operators	35.04	6.5% + 10.45

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*

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. For those without internet access, please contact the division listed below.

The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.

All subsequent annual adjustments will be posted on our Web Site for contractor access.

Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage

As of: March 27, 2024

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.



**GEOTECHNICAL INVESTIGATION REPORT
REPLACEMENT OF BRIDGE NO. 04487
EAST STREET OVER PEQUABUCK RIVER
BRISTOL, CONNECTICUT**

State Project No. 017-192

**May 21, 2021 (rev 8/30/22)
GM2 Project No. 40398.00**



**Prepared by:
GM2 Associates, Inc.
Glastonbury, CT**

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1.0 INTRODUCTION

This report presents the results of our geotechnical engineering services performed for the proposed replacement bridge carrying East Street over Pequabuck River (Bridge No. 04487) in Bristol, Connecticut. Our geotechnical engineering scope of services included advancing four bridge test borings (B-1 through B-4) and one roadway boring (B-5). The bridge borings terminated in bedrock; the top of bedrock ranging from approximately 10 to 18 feet below the existing ground surface. Two to four test probes were also drilled behind each abutment. A Site Location Map and an Exploration Location Plan are included in Appendix A as Figures 1 and 2, respectively. Logs of the test borings are included in Appendix B. A summary of the test probes is shown in Section 4.2

2.0 GENERAL INFORMATION

A summary of the existing site and the proposed project is presented below:

Item	Description
Location	East Street over Pequabuck River in Bristol, Connecticut, next to the intersection with Memorial Boulevard, Appendix A, Figure 1 – Project Locus
Site layout	Appendix A, Figure 2 - Exploration Location Plan
Topography	The bridge deck is at elevation (El) 277 (NAVD 1988 Datum) at the south end and El 278 at the north end; the river edge was estimated to be about El 268 feet, during the time of the GM2 site survey. The bridge is located in a broad river valley. Bedrock outcrops were noted upstream and downstream of the bridge.
Existing Bridge	The existing structure is a 62-foot two-span, 49.5-foot-wide bridge supported on reinforced concrete spread footing foundations. The abutments and center pier, as shown on the Record Drawings are approximately 14 feet tall with footings noted to bear on “solid rock”. It is estimated the abutments and center pier bear at about El 263 feet.

Proposed Bridge	Due to river hydraulic considerations, a two-span bridge will replace the existing bridge. The two-span bridge will include new abutments and a center pier with 30-foot spans. The existing bridge will be demolished, allowing the new bridge substructure to be constructed in the same location as the existing bridge. New abutments will be either gravity or cantilever type, bearing on bedrock. The center pier would also be supported on bedrock. The superstructure will consist of either steel or pre-cast concrete girders and a cast-in-place concrete deck.
Finish Elevation	Similar alignment and as the existing bridge, with a slight lowering in grade providing a more level transition to Memorial Boulevard.
Record Drawings	Connecticut State Highway Department, "Plans for New Bridge over Pequabuck River at East Street – Bristol, Connecticut, dated June 1929.
Reference Documents	9 th Edition, 2020 American Association of State Highway and Transportation Officials (AASHTO) LRFD Bridge Design Specifications 2020 Connecticut Department of Transportation (ConnDOT) Geotechnical Engineering Manual. ConnDOT Bridge Design Manual ConnDOT Standard Specifications for Roads, Bridges, Facilities and Incidental Construction – Form 818

3.0 GEOLOGY

The site is located in a relatively narrow valley associated with the Pequabuck River and controlled by moderately elevated topography. The hills are typically comprised of relatively shallow bedrock overlain by glacial till. The valley is comprised of alluvial deposits of sand, gravel and silt on the order of 5 to 25 feet thick regionally. Cobbles and boulders can be found in the alluvial soils as they are eroded from their parent till deposit and bedrock. For the East Street Bridge site, the alluvial layer is relatively thin due to the presence of bedrock within 20 feet below ground surface.

4.0 SUBSURFACE EXPLORATION

4.1 Test Borings

Four test borings (B-1 through B-4) were drilled behind the existing abutment corners on January 7 through 11, 2021 as shown in Appendix A on the Exploration Location Plan. One test boring (B-5) was drilled for the approach roadway at the north end of the bridge. The borings were located in the field by GM2. Borings B-1 through B-5 were advanced to depths ranging from 7 to 27 feet below the existing ground surface.

The test borings were completed by New England Boring Contractors (NEBC) of Glastonbury, CT. Dig Safe was notified by NEBC in order to locate and mark the location of public underground utilities in proximity to the boring locations.

The test borings were typically advanced using 3 and 4-inch diameter flush joint casing. Soil samples were obtained from the borings using the Standard Penetration Test (SPT) in general accordance with the procedures set forth in ASTM D1586 - *Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils*. Soil samples were obtained using 2-inch O.D., 1.375-inch I.D., split-spoon samplers, driven 24 inches into the ground with a 140-pound automatic hammer with a free fall of 30 inches. The number of blows required

to drive the sampler from 6 to 18-inches of penetration provides the SPT blow count resistance, or N-value. Upon completion of each boring, the borehole was backfilled with auger cuttings and capped with cold mix asphalt.

Rock core samples were obtained in the bedrock encountered at B-1 through B-4 using NX size core barrels. Coring terminated at 19 to 27 feet below ground surface at the north and south abutments, respectively.

4.2 Test Probes

Three to four test probes, identified as P-1 through P-7, were drilled on January 8 and 11, 2021 in a line perpendicular to the existing south and north abutments. The approximate test probe locations are shown on the Exploration Location Plan. The test probes were drilled using 4-inch O.D. solid stem augers and roller bits, terminating as noted in the following table.

Probe No.	Abutment	Total Depth (ft.)	Notes
P-1	South	13	Large area of bituminous concrete lifting during probe drilling, indicating likely cobbles and boulders in the fill. Refusal on probable bedrock.
P-2	South	NA	Not drilled due to uplifted bituminous concrete at P-1
P-3	South	13	Refusal on probable bedrock.
P-4	North	11.5	Refusal on probable bedrock.
P-5	North	12	Refusal on probable bedrock.
P-6	North	3	Refusal on boulder or back of the abutment.
P-7	North	12	Encountered resistance at 4 feet, possibly on the abutment and slid north, terminating at refusal on probable bedrock.

Test probes were performed in an attempt to confirm the shape of the back of the abutment was consistent with dimensions shown on the 1929 Record Drawings. Roller bit drilling methods were needed to penetrate obstructions/boulders in the fill at each abutment. It appears probes terminated on bedrock; since evidence of concrete was not noted on the roller bit when the probe was completed. The test probes seemed to confirm there is little, if any, heel on the abutment foundations and the substructure is at least as wide as shown on the Record Drawings.

4.3 Laboratory Testing

Laboratory testing was performed by Geotesting Express on three soil samples obtained from the test borings to assist in soil classification. The test results, included in Appendix C, are summarized below:

Sample Identification	Depth (feet)	AASHTO Classification	Gravel Content (%)	Sand Content (%)	Fines Content (%)
B-2/S2	3 to 5	SM	20.3	52.2	27.5
B-3/S1	1 to 3	SM	11.5	65.0	23.5
B-5/S1	1 to 3	ML	19.8	32.6	47.6

Laboratory testing was also performed on bedrock samples obtained from B-1 to evaluate compressive strength. The results of the tests, which are also included in Appendix C, are summarized below:

Sample Identification	Lithology	Depth (feet)	Length/Dia. Ratio	Unit Weight (pcf)	Unconfined Compressive Strength (psi)
B-2/C2	Gneiss	19 to 20	2.2	167	16,988
B-3/C1	Gneiss	11 to 12	2.2	169	14,620

5.0 SUBSURFACE CONDITIONS

5.1 Subsurface Profile

Based on the five borings drilled during the exploration program, subsurface conditions can be generalized as follow:

Description	Approximate Depth to Bottom of Stratum (feet)	Material Encountered	Consistency / Relative Density
Fill	7 to 13.5	Poorly Graded Sand, with silt, trace gravel to Sandy Silt, with gravel, brown. Cobbles and boulders should be expected. (A-1-a, A-1-b)	Loose to dense
Alluvium	10.5 to 17.5	Poorly Graded Sand with gravel to Silty Sand, brown to red-brown. Cobble and boulders should be expected. (A-2-4, A-4)	Loose to medium dense
Bedrock	N/A	Gray and brown, coarse-grained Gneiss, thinly foliated. (RQD = 43% to 90%)	Hard, slightly weathered to unweathered, except the upper few feet can be severely weathered

Conditions encountered at the exploration locations are indicated on the boring logs. A north-south subsurface profile and subsurface profiles at each abutment are shown on Figures 3 and 4, respectively. Stratification boundaries on the boring log represent the approximate location of changes in soil and rock types; in situ, the transition between materials may be gradual. Further soil and rock description details can be found on the boring logs in Appendix B of this report.

5.2 Groundwater Conditions

Explorations were noted during drilling and after completion for the presence and level of groundwater. While drilling at B-1, B-2 and B-4, the groundwater was estimated at approximately 9 to 10 feet (approximately El 268 feet) generally corresponding to a few feet higher than the water level in the Pequabuck River as measured from the bridge deck.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff, river elevation, and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. Groundwater level fluctuations should be considered when developing the design and construction plans for the project.

5.3 Summary of Soil Properties

Soil parameters were determined for each geologic layer encountered in the test borings based on relative density, observation of the soil types, LRFD Design Specifications, and engineering judgment. A summary of the soil parameters used for the basis of our geotechnical engineering analyses is shown below:

Geologic Deposit	Total Unit Weight (pcf)	Drained Internal Friction (degrees)	Cohesion (psf)	Poisson's Ratio	Intact Elastic Modulus (ksi)	Rock Mass Modulus (ksi)	Unconfined Compressive Strength (ksi)
Existing Fill	125	32	0	0.25	3.0	NA	NA
Alluvium	120	30	0	0.30	2.5	NA	NA
Gneiss Bedrock	168	NA	NA	0.15	8,000	6,100	15.8 ⁽¹⁾

1. The unconfined compressive strength is based on laboratory tests of intact rock samples. Value used for design is the average of the two laboratory test results.

5.4 Seismic Considerations

Design of transportation structures subject to earthquake ground motions requires classification of the upper 100 feet of the site profile in accordance with AASHTO LRFD Specifications, Section 3-10. The Seismic Site Class type for this project was defined by a weighted average of N-Values. We recommend the following seismic design parameters.

Description	Value
Reference Used	AASHTO
Site Class ⁽¹⁾	C (AASHTO 3.10.3.1)
Seismic Zone	1 (AASHTO 3.10.6)
Maximum Considered Earthquake Ground Motions (5 Percent Critical Damping)	S _s - 0.130g (0.2 second spectral response acceleration) (AASHTO Figure 3.10.2.1-2)
	S ₁ - 0.035g (1.0 second spectral response acceleration) (AASHTO Figure 3.10.2.1-3)
Liquefaction Potential in Event of an Earthquake	Not susceptible

1. Site Class is based on the average characteristics of the upper 100 feet of the subsurface profile. The borings extended to a maximum depth of 27 feet, terminating in bedrock. Although the site is comprised of bedrock, AASHTO criteria for Site Class A or B requires shear wave velocity data. The Site Class was downgraded to C due to lack of site-specific shear wave data.

6.0 EVALUATION AND RECOMMENDATIONS

Based on the encountered subsurface conditions, the site is suitable for supporting new bridge abutments on spread footings bearing on Concrete Fill over sound bedrock. Since spread footings will bear on erosion resistant material, scour is not a concern. Wing walls may also be supported on spread footings, using the design parameters presented herein.

6.1 Preliminary Design Loads

GM2 has estimated preliminary loads per abutment, which were used in estimating settlement for spread footing foundations. The maximum factored vertical load per linear foot of abutment width, including a combined dead and live load, is approximately 20 kips/ft. Lateral loads due to soil pressure should be estimated based on effective unit weights and drained internal friction angles shown in Section 5.3.

6.2 Spread Footings

6.2.1 Design Parameters

Design parameters for shallow foundations for constructing the new abutments and center pier as well as related structural elements are presented in the following table. The existing abutment foundations bear at about El 263 to 265 feet. For the new abutments, footings bearing at slightly lower elevations were used in our analyses.

Description	Value
Estimated Design Bearing Elevation (feet)	South Abutment: El 260 Center Pier: El 262 North Abutment: El 263
Bearing Materials	Directly on Sound Bedrock or Concrete Fill over Bedrock
Nominal Bearing Resistance, q_n (ksf) – Strength Limit (AASHTO 10.6.3.2.2)	142 (Note 1)
Bearing Resistance Factor, ϕ_b - Strength Limit (AASHTO 10.5.5.2.2-1)	0.45
Presumptive Bearing Resistance, q_n (ksf) – Service Limit (AASHTO C10.6.2.6.1-1 and 10.6.2.6.2)	142 (Note 1)
Sliding Resistance, $\tan\delta$ (FHWA-SA-02-05 Table 5-15)	0.70 ($\delta=35$ degrees)
Shear Resistance Factor for Sliding, $\phi\tau$ - Strength Limit (AASHTO 10.5.5.2.2-1)	0.80
Passive Resistance Factor for Sliding, ϕ_{ep} - Strength Limit (AASHTO 10.5.5.2.2-1)	0.50
Minimum Footing Embedment below Finished Grade for Frost Protection (inches)	24

Notes

1. The nominal bearing resistance is limited to 30 percent of the compressive strength (3,300 psi), Class PCC 03340 (CTDOT M.03.02). The actual nominal bearing resistance of the bedrock is greater.

6.2.2 Settlement Analysis

Spread footings will bear on leveling Concrete Fill over bedrock, therefore minor settlement is expected due to compression of the rock mass. For spread footings supported on bedrock, total settlement is expected to be 1/4 inch or less.

6.3 Lateral Earth Pressures

Reinforced concrete wingwalls with unbalanced backfill levels should be designed for earth pressures at least equal to those indicated in the following table. Earth pressures are influenced by structural design of the walls, conditions of wall restraint, methods of construction and/or compaction and the strength of the materials being

restrained. Active earth pressure is commonly used for design of freestanding cantilever retaining walls and assumes wall movement. The "at-rest" condition assumes no wall movement. In accordance with the ConnDOT Bridge Design Manual, wingwall and abutment backfill shall consist of Pervious Structure Backfill.

Earth Pressure Coefficients

Earth Pressure Conditions	Coefficient for Backfill Type	Equivalent Fluid Density (pcf)	Surcharge Pressure, p_1 (psf)	Earth Pressure, p_2 (psf)
Active (K_a)	Granular - 0.27	35	(0.27)S	(35)H
At-Rest (K_o)	Granular - 0.43	56	(0.43)S	(56)H
Passive (K_p)	Granular - 3.69	480	---	---

Applicable conditions to the above tables include:

- Internal friction angle of 35 degrees for compacted Pervious Structure Backfill
- Compacted effective unit weight of backfill equal to 130 pounds per cubic foot
- For active earth pressure, wall must rotate about base, with top lateral movements of about 0.002 H to 0.004 H, where H is wall height
- For passive earth pressure to develop, wall must move horizontally to mobilize resistance
- Uniform surcharge, where S is surcharge pressure
- Pervious Structure Backfill compacted to at least 98 percent of AASHTO T180 maximum dry density (Form 818)
- Loading from heavy compaction equipment not included
- No hydrostatic pressures acting on wall
- Ignore passive pressure in frost zone

6.4 Wall Drainage

Abutments and wingwalls must include provisions to dissipate unbalanced water pressure along the back of the wall. Drainage requirements should satisfy the CONNDOT Bridge Design Manual, Section 5.7 – Subsurface Drainage. In lieu of weepholes, it is recommended underdrains be installed near normal river level and designed to discharge at both ends of the abutment.

6.5 Global Stability

Global stability of the structure and approach embankments were not evaluated. No additional embankment fill loading is planned. Due to the satisfactory performance of the existing bridge and embankments bearing on bedrock, the need to evaluate global stability is not warranted. New embankment side slopes should be constructed with a maximum 2H:1V incline in accordance with the CONNDOT Highway Design Manual.

6.6 General Construction Considerations

6.6.1 Dewatering

Construction dewatering should be anticipated to remove existing fill and alluvial soil to sound bedrock for the new spread footing supported abutments. It is anticipated groundwater level may be 3 to 6 feet or more, depending on the season, above the bedrock subgrades, the greater depth occurring at the excavation for the south abutment. Water should be removed, to the extent practical, to the bedrock surface. Concrete Fill should be placed in a manner that displaces the remaining water from the bedrock surface. Comments regarding the need for a cofferdam are provided in Section 6.6.2

6.6.2 Temporary Excavations

Based on an estimated top of bedrock near El 260 to El 267 feet for the abutments, temporary lateral support will be necessary for placing Concrete Fill, as needed, and constructing abutments. It is understood that East Street will be closed from Memorial Boulevard to Riverside Avenue in order to replace the bridge. It is recommended at this time to assume a cofferdam will be required at each abutment location. The individual contractor(s) is responsible for designing and constructing stable, temporary excavations, as required, to maintain stability of the excavation sides and the excavation bottom.

Constructing cofferdams for the abutment excavations with interior braced sheet pile support systems will be difficult due to likely obstructions in the overburden, as well as shallow bedrock. Cofferdam support options should consider drilled and socketed soldier piles with lagging. Lateral earth support should be designed by a specialty contractor or engineer experienced in the design of lateral earth support systems. The design should include surcharge load from construction equipment and vehicle traffic, if the bridge is built in stages.

Excavations should comply with applicable local, state, and federal safety regulations, including current OSHA Excavation and Trench Safety Standards. The Contractor shall select the means and methods for providing support of excavations in accordance with safety requirements, plans, and project specifications. Based on our review of the test boring samples, the site soil would be classified as Type C, therefore a temporary open dewatered slope of 1.5H:1V may be suitable for preliminary estimating purposes. The Contractor must evaluate soil and bedrock conditions during excavations since variations in the soil can occur across the site. We recommend excavations be monitored continuously for signs of deterioration such as seepage of water or sloughing of soil. The contractor is ultimately responsible for excavation safety.

There are adjacent structures that will require special protection and monitoring as a result of the excavations, such as the single-story brick building at the northeast corner of the bridge and street lighting and underground utilities below Memorial Boulevard at the south end of the bridge. The building and the utilities could be within a zone of influence from the excavation, in other words they may be horizontally closer than the depth of the excavation.

The level of monitoring for the building will depend on its structural condition and the elevation of the lowest floor level. It is not confirmed at the time of this report, if the existing building has a basement level. The presence of a basement and therefore deeper foundations would be beneficial to reducing the chance of construction related settlement. If the building does not have a basement, the risk of settlement is greater depending on the type of temporary excavation support; underpinning may be required. Regarding utilities along Memorial Boulevard, they should be identified (accurately located and elevations determined) before construction to evaluate the level of protection.

It is recommended the project documents include technical provisions for the contractor to perform a pre-construction survey of adjacent structures and utilities. Temporary lateral support such as a cofferdam or a single line of sheeting should be designed to minimize lateral movements of adjacent structures. Technical provisions should also include requirements to monitor the existing building for settlement and underground utilities for lateral displacement.

Temporary excavation support and dewatering systems are considered major components to the earthwork operations for this project. The approach to these systems should be coordinated between the Owner, Geotechnical Engineer, Structural Engineer, and Contractor.

6.6.3 Spread Footing Foundation Subgrade Preparation

Due to the anticipated irregular and sloped bedrock surfaces, it is recommended Concrete Fill be placed below both the south and north abutments. Concrete Fill will reduce groundwater infiltration and protect and level the

excavation subgrades. The thickness of the Concrete Fill is estimated to be about 1 foot, based on the bottom of footing elevations in Section 6.2.1. The lateral limits of Concrete Fill should extend at least 6 inches beyond the edge of the footing. Prior to placing Concrete Fill, loose-jointed, weathered bedrock should be removed.

6.6.4 Fill Material Types

Off-site fill should meet the following material property requirements:

Fill Type	ConnDOT Reference	Acceptable Location for Placement
Concrete Fill	M.03.02, Class PCC 03340	Below spread footing foundations
Pervious Structure Backfill	M.02.05 – Grading “B”	Backfilling abutments and wingwalls.
Crushed Stone	M.01.01 – No. 67 Stone	Below spread footing foundations and around foundation drains
Embankment Fill	2.07 - Borrow	Embankment fill where finished grade is no steeper than 2H:1V. Excavated soils may be selectively re-used as Embankment fill, provided they are granular in composition, are free of deleterious materials, and contain less than 25 percent passing the No. 200 sieve.

6.6.5 Grading and Drainage

In conjunction with the proposed new abutments, there is no room to construct embankments with open side slopes. Roadway approach fill will be confined by the abutments and wingwalls.

Any exposed soil surfaces (unpaved) remaining after construction should be seeded and protected from eroding. Seeded surfaces may be protected with erosion mats until the vegetation is established. Site grading should direct surface water away from the wing walls and abutments.

7.0 CLOSING

We prepared this report for the exclusive use of the City of Bristol, Connecticut and their designated agents for design of the proposed East Street Bridge over Pequabuck River in Bristol, Connecticut. Recommendations in this report are based upon the information obtained from the subsurface investigation, and our understanding of the proposed construction. Changes to our recommendations may be warranted if the actual subsurface conditions vary from those anticipated, or if the proposed construction varies from our understanding, as discussed in this report. Isolated information is not to be reproduced, copied or transferred from this report without written consent from GM2 Associates, Inc.

Generally accepted soil mechanics and foundation engineering practices were used to develop our recommendations. We conducted our services in a manner consistent with a level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. We recommend the Geotechnical Engineer be provided the opportunity to review the foundation drawings and contract specifications to evaluate consistency with our recommendations.

This report does not reflect variations that may occur between boring locations across the site, or due to the modifying effects of weather. Furthermore, the scope of services for this project does not include either specifically or by implication any environmental or biological assessment of the site or identification or prevention of pollutants, hazardous material or conditions.

We recommend this report be made available to prospective construction bidders by incorporating it into the contract documents. Bidders should be informed that this report was prepared for design purposes only and may not contain sufficient information to prepare an accurate bid.

We appreciate the opportunity to be of service to you on this project. If you have questions regarding this report, or if we may provide additional services, please contact us.

Respectfully submitted,
GM2 Associates, Inc.

Prepared by:

Reviewed by:



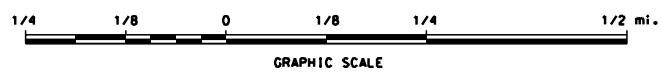
Lawrence J. Dwyer, P.E. (PEN.0015120)
Lead Geotechnical Engineer

Paul Brand
Project Manager

APPENDIX A
FIGURES



PROJECT SITE LOCATION



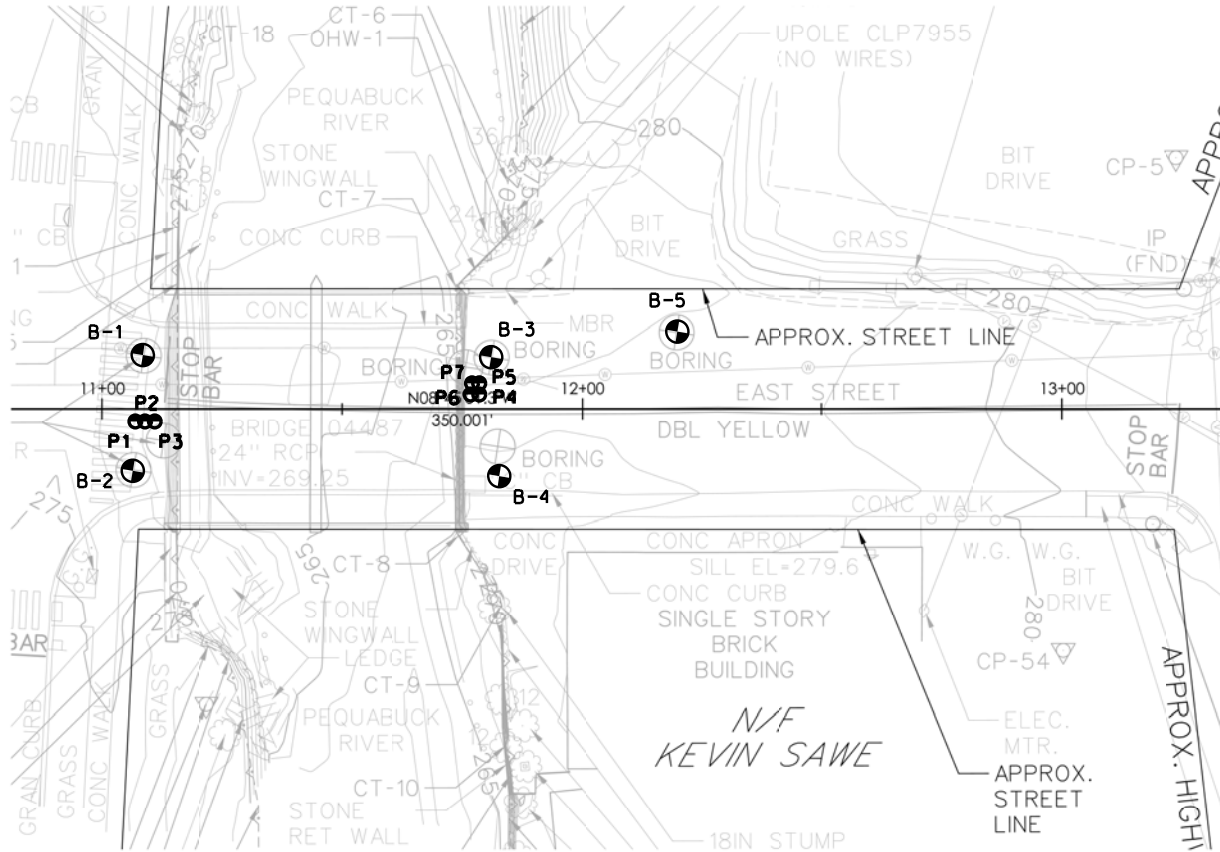
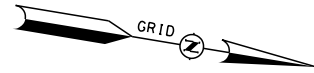
EAST ST. OVER PEQUABUCK RIVER

BRISTOL • CONNECTICUT

PROJECT LOCATION MAP

DGN	FIGURE NO.	SHEET NO.	SHEET TOTAL
ESB_BOR_LOCUS(FIG1)	1	1	1





LEGEND

- B-1 APPROXIMATE TEST BORING LOCATION
- P1 APPROXIMATE ABUTMENT PROBE LOCATION



NOTES

1. DRAWING WAS PREPARED FROM A GM2 ASSOCIATES, INC. SITE SURVEY DURING JANUARY 2021.
2. EXPLORATION LOCATIONS WERE TAPED FROM EXISTING SITE FEATURES.
3. GROUND SURFACE ELEVATIONS AT EXPLORATION LOCATIONS WERE INTERPOLATED FROM CONTOURS ON THE BASE PLAN.

EAST ST. OVER PEQUABUCK RIVER
BRISTOL, CONNECTICUT

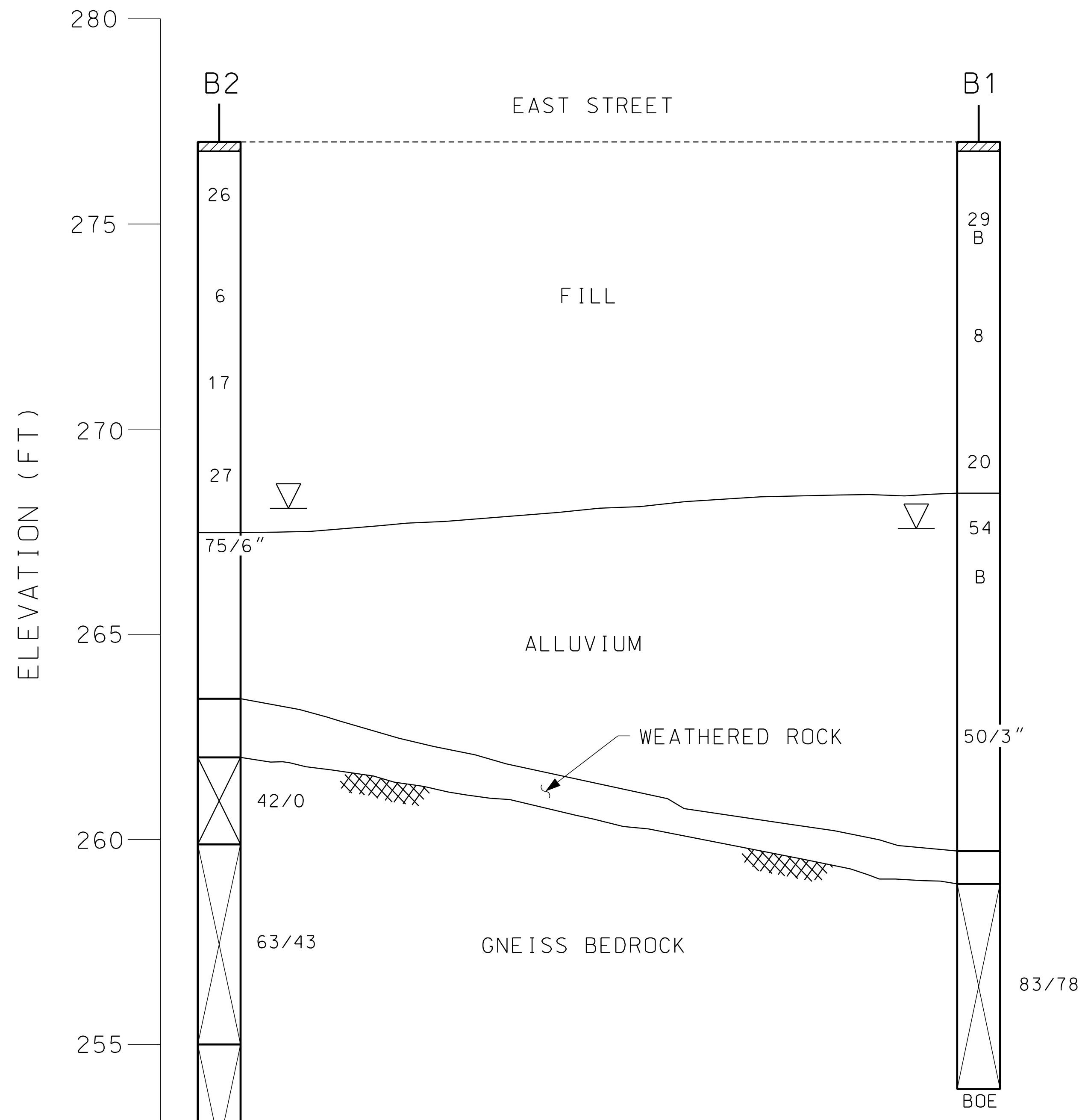
EXPLORATION LOCATION PLAN



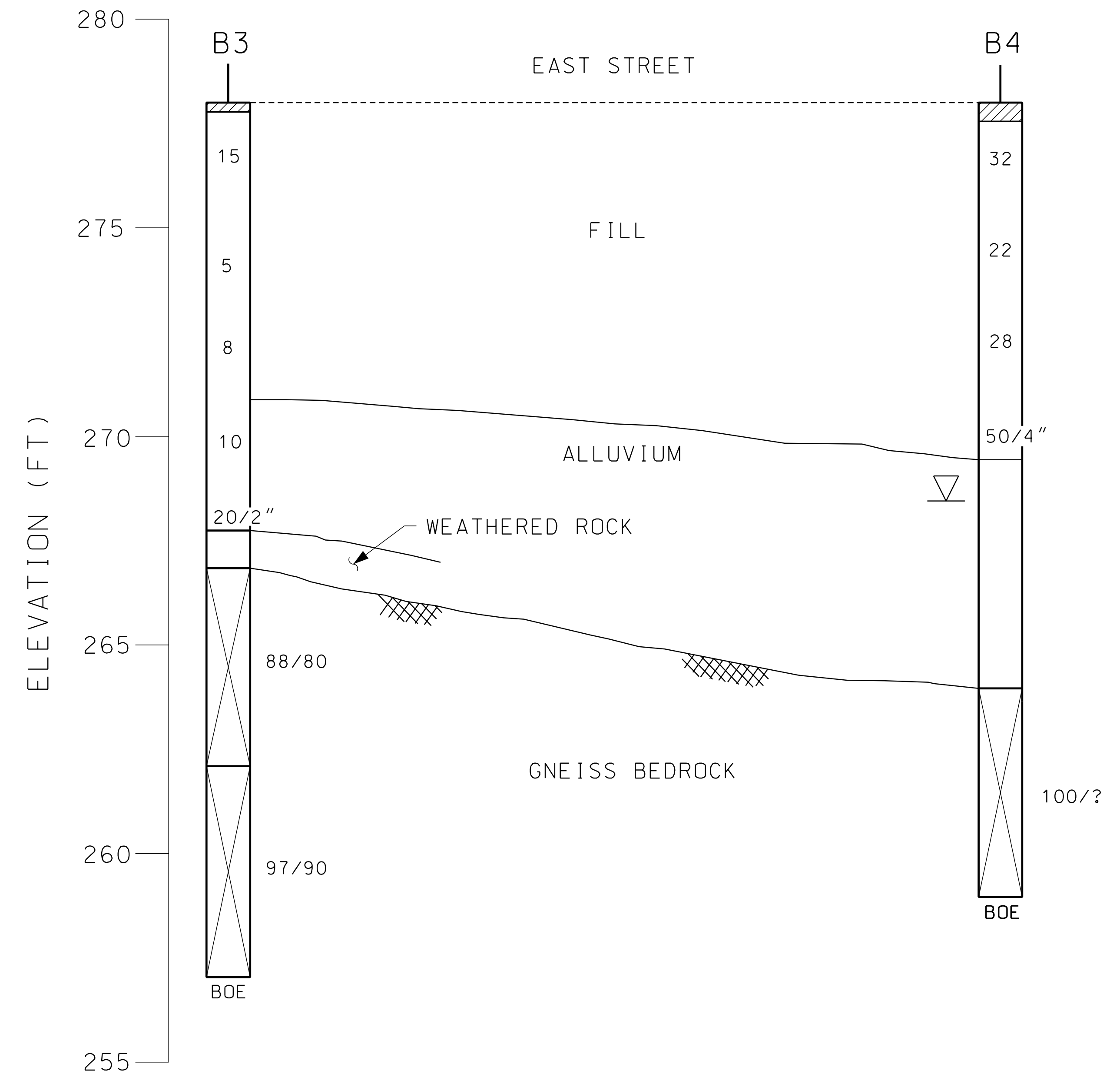
DGN	FIGURE NO.	SHEET NO.	SHEET TOTAL
ESB_BOR_LOC(FIG2)	2	1	1

SDR PROCESSED	E. ROLSER	DATE	8/29/2022
NEW DESIGN	E. ROLSER	DATE	8/29/2022
SHEET CHECKED	L. DWYER	DATE	8/29/2022
AS BUILT DETAILS		DATE	

REVISIONS AFTER PROPOSAL	STATION	DESCRIPTION



SOUTH ABUTMENT
SCALE: 1"=4' (H&V)



NORTH ABUTMENT
SCALE: 1"=4' (H&V)

- LEGEND**
- B1 — TEST BORING DESIGNATION
 - 11 — INTERPOLATED STATION CHANGE
 - 27 — WATER LEVEL IN BOREHOLE
 - 6 — BOULDER(S) ENCOUNTERED
 - B — BOULDER(S) ENCOUNTERED
 - 43 — SPLIT SPOON SAMPLE, N-VALUE (BLOWS PER 12" PENETRATION)
 - 87/53 — BED ROCK CORE SAMPLE, % RECOVERY/% ROD
 - BOE — BOTTOM OF EXPLORATION



EAST ST. OVER PEQUABUCK RIVER			
BRISTOL, CONNECTICUT			
SUBSURFACE PROFILES AT ABUTMENTS			
DGN	FIGURE NO.	SHEET NO.	TOTAL SHEETS
ESB_PRO(2)	4	2	2

APPENDIX B
TEST BORING LOGS



GM2 Associates, Inc.
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 Fax: 860-657-2926

BORING NUMBER B-1

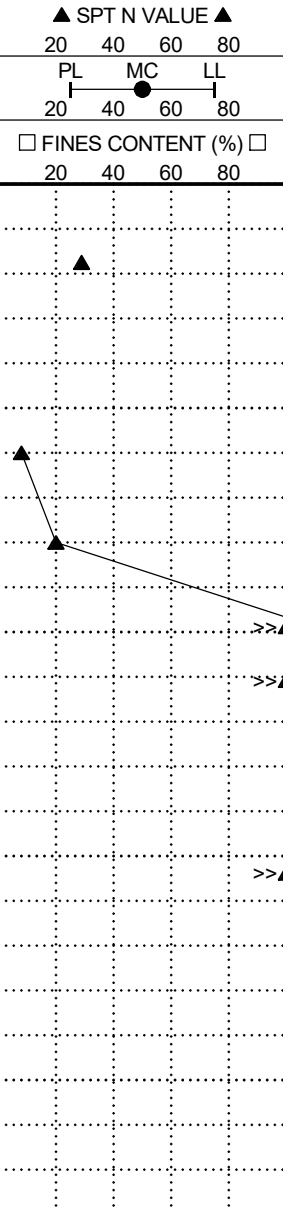
CLIENT City of Bristol, CT.
PROJECT NUMBER 40398.00
DATE STARTED 1/11/21 **COMPLETED** 1/11/21
DRILLING CONTRACTOR New England Boring Contractors
DRILLING METHOD Bore and wash
LOGGED BY G. Jacobsen **CHECKED BY** L. Dwyer
NOTES _____

PROJECT NAME Replacement of Bridge No. 04487
PROJECT LOCATION Bristol, CT.
GROUND ELEVATION 276.9 ft **HOLE SIZE** 4" inches
GROUND WATER LEVELS:
AT TIME OF DRILLING ---
AT END OF DRILLING 10.00 ft / Elev 266.90 ft Estimated
AFTER DRILLING ---

GINT STD US LAB.GDT - 8/28/22 15:07 - T:\PROJECTS\CONNECTICUT\40398 - EAST STREET OVER PEQUABUCK RIVER - BRISTOL\TEST BORINGS AND LAB\LOGS\EAST STREET OVER PEQUABUCK RIVER.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲				
								20	40	60	80	
0		4 Inches bituminous concrete										
0 - 2.5'	[Cross-hatched pattern]	POORLY GRADED SAND WITH SILT, (SP-SM) gray to brown, trace gravel (FILL)	SS 1	44	5-19-10 (29)							
2.5' - 3.5'	[Dashed line]	(Augured through boulder from 2.5' to 3.5') (FILL)	AU 1									
3.5' - 5'	[Cross-hatched pattern]	POORLY GRADED SAND WITH SILT, (SP-SM) reddish brown to brown, trace gravel (FILL)										
5' - 7'	[Cross-hatched pattern]	POORLY GRADED SAND WITH SILT, (SP-SM) brown, with gravel (FILL)	SS 2	50	4-4-4-4 (8)							
7' - 8'	[Cross-hatched pattern]	POORLY GRADED SAND WITH SILT, (SP-SM) brown, with gravel (FILL)	SS 3	58	7-8-12-11 (20)							
8' - 10'	[Dotted pattern]	POORLY GRADED SAND, (SP) brown, trace gravel, trace silt (ALLUVIUM)	SS 4	48	7-4-50-50/3"							
10' - 11'	[Dotted pattern]	(Rollerbitted through boulder from 11' to 13') (ALLUVIUM)	SS 5	0	70/2"							
11' - 15'	[Dotted pattern]	POORLY GRADED SAND, (SP) brown to reddish brown, with gravel (ALLUVIUM)										
15' - 17'	[Dotted pattern]	POORLY GRADED SAND, (SP) brown to reddish brown, with gravel (ALLUVIUM)	SS 6	67	40-50/3"							
17' - 20'	[Diagonal hatched pattern]	GNEISS, highly weathered (WEATHERED ROCK)										
20' - 23.0'	[Diagonal hatched pattern]	GNEISS, slightly weathered, thinly foliated, gray, coarse, hard, close fracture spacing, 15° bedding angle, Several vertical, healed cracks	RC 1	83 (78)								

Bottom of borehole at 23.0 feet.





GM2 Associates, Inc.
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BORING NUMBER B-2

CLIENT City of Bristol, CT.
PROJECT NUMBER 40398.00
DATE STARTED 1/7/21 **COMPLETED** 1/7/21
DRILLING CONTRACTOR New England Boring Contractors
DRILLING METHOD Bore and wash
LOGGED BY G.Jacobsen **CHECKED BY** L. Dwyer
NOTES _____

PROJECT NAME Replacement of Bridge No. 04487
PROJECT LOCATION Bristol, CT.
GROUND ELEVATION 276.7 ft **HOLE SIZE** 4" inches
GROUND WATER LEVELS:
 ▽ **AT TIME OF DRILLING** 9.00 ft / Elev 267.70 ft Initial
AT END OF DRILLING ---
AFTER DRILLING ---

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 8/28/22 15:07 - T:\PROJECTS\CONNECTICUT\40398 - EAST STREET OVER PEQUABUCK RIVER - BRISTOL\TEST BORINGS AND LABLOGS\EAST STREET OVER PEQUABUCK RIVER.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								PL	MC	LL	
								□ FINES CONTENT (%) □			
								20	40	60	80
0		4 Inches bituminous concrete									
		SILTY SAND, (SM) gray to dark brown, with gravel (FILL)	SS 1	17	10-11-15-9 (26)						
			SS 2	33	6-4-2-4 (6)						
5		POORLY GRADED SAND WITH SILT, (SP-SM) dark brown, with rock fragments (FILL)	SS 3	25	4-9-8-4 (17)						
			SS 4	25	22-18-9-5 (27)						
10		POORLY GRADED SAND WITH SILT, (SP-SM) brown, with gravel (ALLUVIUM)	SS 5	50	10-75						
15		GNEISS, highly weathered, thinly foliated, brown to gray, soft, close fracture spacing, 15° bedding angle, One vertical joint (WEATHERED ROCK)	RC 1	42 (0)							
		GNEISS, moderately weathered, thinly foliated, brown to gray, medium, hard, close fracture spacing, 15° bedding angle, Several high angle and vertical joints. (BEDROCK)	RC 2	63 (43)							
20		GNEISS, unweathered, thinly foliated, brown to gray, medium, hard, close fracture spacing, 15° bedding angle, Several high angle and vertical joints. (BEDROCK)	RC 3	97 (63)							
25											

Bottom of borehole at 27.0 feet.



GM2 Associates, Inc.
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 Glastonbury, CT 06033
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 Fax: 860-657-2926

BORING NUMBER B-3

CLIENT City of Bristol, CT.
PROJECT NUMBER 40398.00
DATE STARTED 1/7/21 **COMPLETED** 1/7/21
DRILLING CONTRACTOR New England Boring Contractors
DRILLING METHOD Bore and wash
LOGGED BY G. Jacobsen **CHECKED BY** L. Dwyer
NOTES _____

PROJECT NAME Replacement of Bridge No. 04487
PROJECT LOCATION Bristol, CT.
GROUND ELEVATION 277.8 ft **HOLE SIZE** 4" inches
GROUND WATER LEVELS:
AT TIME OF DRILLING --- Not Measured
AT END OF DRILLING ---
AFTER DRILLING ---

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 8/28/22 15:07 - T:\PROJECTS\CONNECTICUT\40398 - EAST STREET OVER PEQUABUCK RIVER - BRISTOL\TEST BORINGS AND LAB\LOGS\EAST STREET OVER PEQUABUCK RIVER.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								PL	MC	LL	
								20	40	60	80
								20	40	60	80
								□ FINES CONTENT (%) □			
								20	40	60	80
0		4 Inches bituminous concrete									
0 - 1		SILTY SAND, (SM) brown, trace gravel (FILL) SILTY SAND, (SM) brown, trace gravel (FILL)	SS 1	50	18-9-6-4 (15)						
1 - 2			SS 2	17	5-3-2-2 (5)						
2 - 3			SS 3	58	2-3-5-5 (8)						
3 - 10		POORLY GRADED SAND WITH SILT, (SP-SM) brown, trace gravel, laminated with sandy silt (ALLUVIUM)	SS 4	58	4-5-5-6 (10)						
10 - 11		GNEISS, highly weathered, thinly foliated, gray (WEATHERED ROCK)	SS 5	50	20/2"						
11 - 16		GNEISS, slightly weathered, thinly foliated, gray, coarse, very close fracture spacing, 15° bedding angle, Several high angle joints (BEDROCK)	RC 1	88 (80)							
16 - 21		GNEISS, unweathered, thinly foliated, gray, coarse, very close fracture spacing, 15° bedding angle, Several high angle joints (BEDROCK)	RC 2	97 (90)							

Bottom of borehole at 21.0 feet.



GM2 Associates, Inc.
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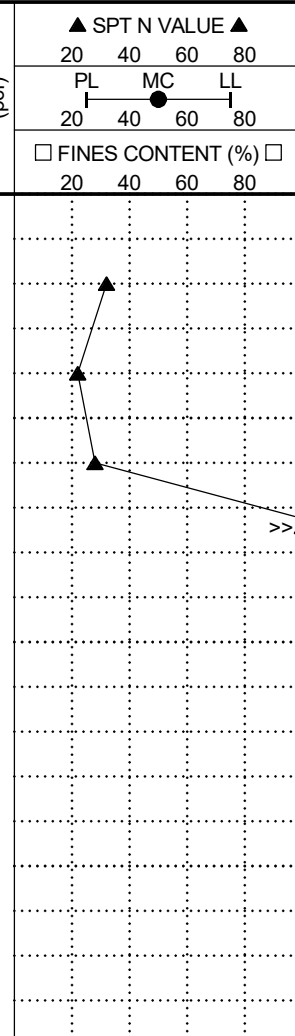
BORING NUMBER B-4

CLIENT City of Bristol, CT.
PROJECT NUMBER 40398.00
DATE STARTED 1/8/21 **COMPLETED** 1/8/21
DRILLING CONTRACTOR New England Boring Contractors
DRILLING METHOD Bore and wash
LOGGED BY G.Jacobsen **CHECKED BY** L. Dwyer
NOTES _____

PROJECT NAME Replacement of Bridge No. 04487
PROJECT LOCATION Bristol, CT.
GROUND ELEVATION 278.1 ft **HOLE SIZE** 4" inches
GROUND WATER LEVELS:
 ▽ **AT TIME OF DRILLING** 10.00 ft / Elev 268.10 ft Estimated
AT END OF DRILLING ---
AFTER DRILLING ---

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 8/28/22 15:07 - T:\PROJECTS\CONNECTICUT\40398 - EAST STREET OVER PEQUABUCK RIVER - BRISTOL\TEST BORINGS AND LAB\LOGS\EAST STREET OVER PEQUABUCK RIVER - BRISTOL\TEST BORINGS AND LAB\LOGS\EAST STREET OVER PEQUABUCK RIVER.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲			
								PL	MC	LL	
								□ FINES CONTENT (%) □			
								20	40	60	80
0		9.5 Inches bituminous concrete									
0 - 4.5		POORLY GRADED SAND WITH SILT, brown to dark brown, little gravel (FILL)	SS 1	58	13-12-20-14 (32)						
4.5 - 9.5		SILTY SAND, brown, with cobbles, and, trace gravel (FILL)	SS 2	50	12-10-12-10 (22)						
9.5 - 10.5		SILTY SAND, brown, with cobbles, Rollerbitted/drove casing through several cobbles 9' to 14' (ALLUVIUM)	SS 3	42	5-8-20-30 (28)						
10.5 - 15.0		GNEISS, moderately weathered to slightly weathered, thinly foliated, light gray, coarse, very close to medium fracture spacing, 30° to 60° bedding angle (BEDROCK)	RC 1	100 (40)	2-50/4"						



Bottom of borehole at 19.0 feet.



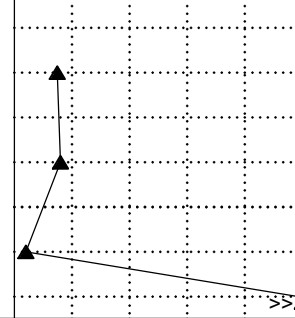
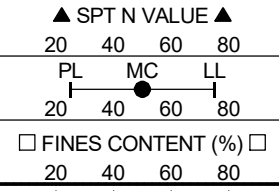
GM2 Associates, Inc.
 115 Glastonbury Blvd.
 Glastonbury, CT 06033
 Telephone: 860-659-1416
 Fax: 860-657-2926

BORING NUMBER B-5

GEOTECH BH PLOTS - GINT STD US LAB.GDT - 8/28/22 15:07 - T:\PROJECTS\CONNECTICUT\40398 - EAST STREET OVER PEQUABUCK RIVER - BRISTOL TEST BORINGS AND LABLOGS\EAST STREET OVER PEQUABUCK RIVER.GPJ

CLIENT <u>City of Bristol, CT.</u> PROJECT NUMBER <u>40398.00</u> DATE STARTED <u>1/8/21</u> COMPLETED <u>1/8/21</u> DRILLING CONTRACTOR <u>New England Boring Contractors</u> DRILLING METHOD <u>Solid Stem Auger</u> LOGGED BY <u>G.Jacobsen</u> CHECKED BY <u>L. Dwyer</u> NOTES _____	PROJECT NAME <u>Replacement of Bridge No. 04487</u> PROJECT LOCATION <u>Bristol, CT.</u> GROUND ELEVATION <u>278.2 ft</u> HOLE SIZE <u>4" inches</u> GROUND WATER LEVELS: AT TIME OF DRILLING <u>---</u> AT END OF DRILLING <u>--- Not Encountered</u> AFTER DRILLING <u>---</u>
--	--

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	▲ SPT N VALUE ▲		
								20	40	60
0		9.5 Inches bituminous concrete								
		SANDY SILT, (ML) brown, fine grained, with gravel (FILL)	SS 1	58	6-7-8-7 (15)					
		SANDY SILT, (ML) brown, fine grained, little gravel (FILL)	SS 2	50	7-8-8-8 (16)					
5		SILTY SAND, (SM) brown to yellowish brown, fine grained (ALLUVIUM)	SS 3	50	5-2-2-2 (4)					
		Refusal at 7.5 feet. Bottom of borehole at 7.5 feet.	SS 4	67	50/3"					

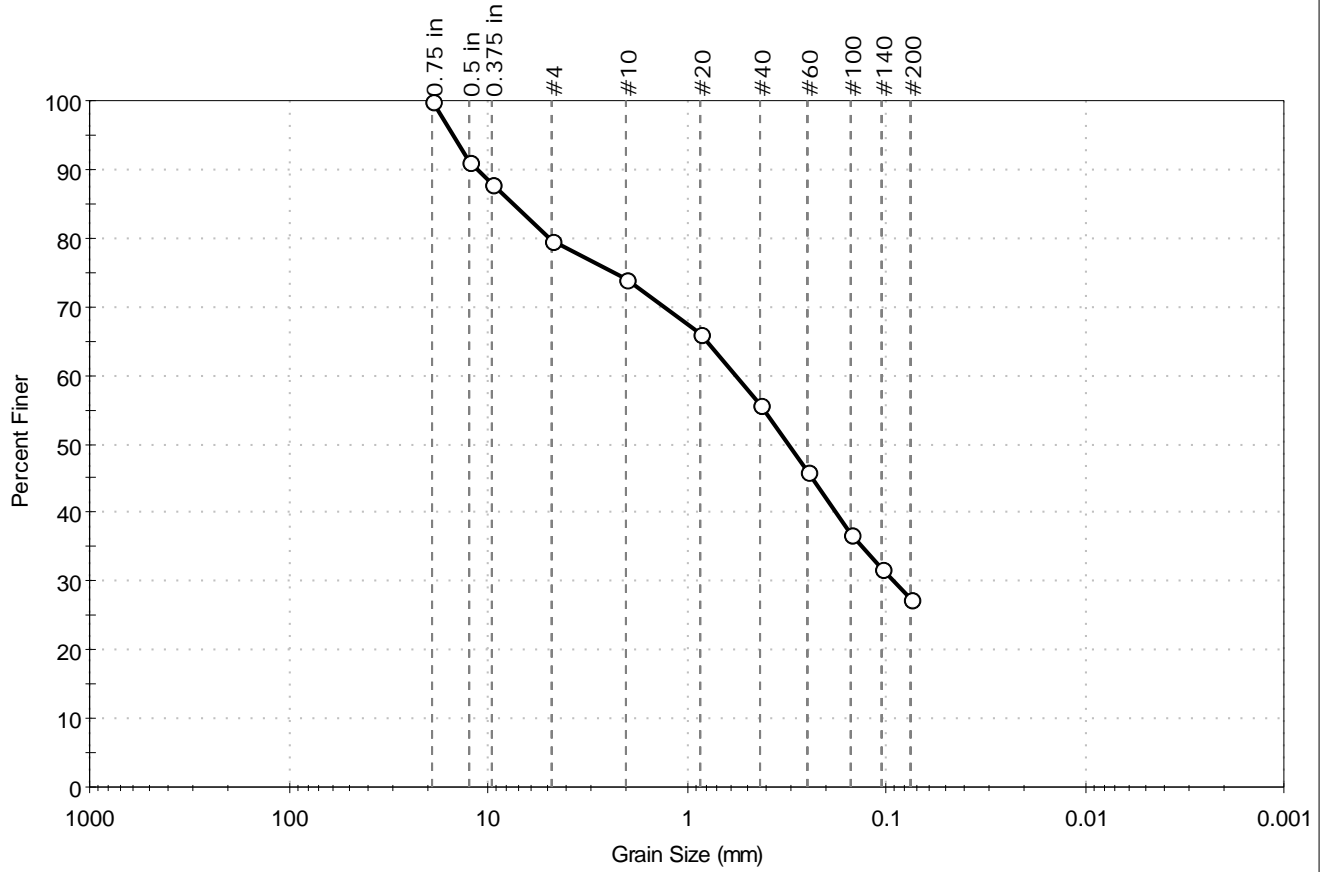


APPENDIX C
LABORATORY TEST RESULTS



Client: GM2 Associates	Project No: GTX-313139
Project: Replace Bridge No. 04487	
Location: Bristol, CT	
Boring ID: B2	Sample Type: bag
Sample ID: S2	Test Date: 02/03/21
Depth: 3-5 ft	Test Id: 609342
Test Comment: ---	Tested By: ckg
Visual Description: Moist, dark brown silty sand with gravel	Checked By: bfs
Sample Comment: ---	

Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	20.3	52.2	27.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	91		
0.375 in	9.50	88		
#4	4.75	80		
#10	2.00	74		
#20	0.85	66		
#40	0.42	56		
#60	0.25	46		
#100	0.15	37		
#140	0.11	32		
#200	0.075	27		

<u>Coefficients</u>	
D ₈₅ = 7.4615 mm	D ₃₀ = 0.0918 mm
D ₆₀ = 0.5610 mm	D ₁₅ = N/A
D ₅₀ = 0.3095 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

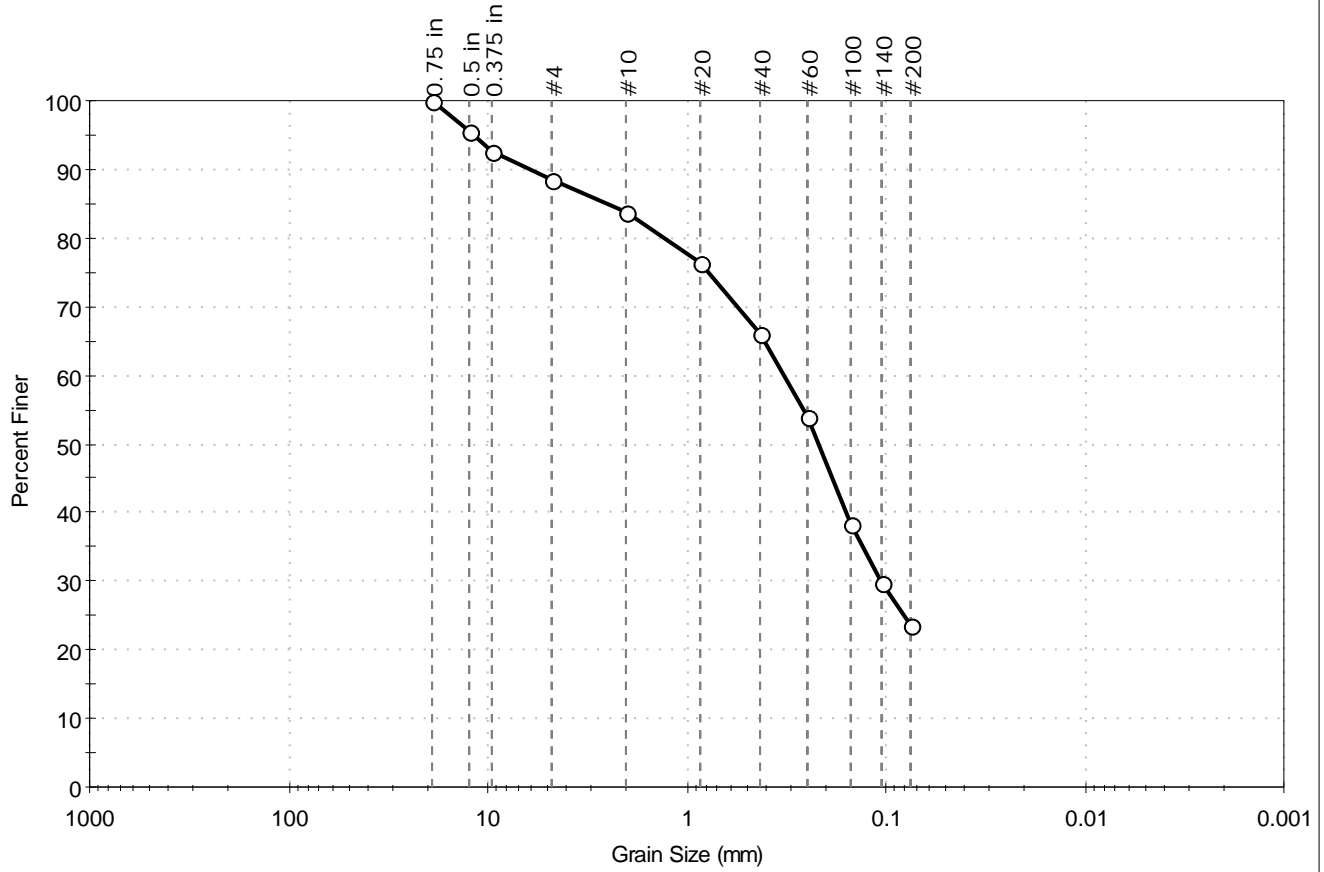
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client: GM2 Associates	Project No: GTX-313139
Project: Replace Bridge No. 04487	
Location: Bristol, CT	
Boring ID: B3	Sample Type: bag
Sample ID: S1	Test Date: 02/03/21
Depth: 1-3 ft	Test Id: 609343
Test Comment: ---	Tested By: ckg
Visual Description: Moist, brown silty sand	Checked By: bfs
Sample Comment: ---	

Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	11.5	65.0	23.5

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
0.75 in	19.00	100		
0.5 in	12.50	96		
0.375 in	9.50	93		
#4	4.75	88		
#10	2.00	84		
#20	0.85	76		
#40	0.42	66		
#60	0.25	54		
#100	0.15	38		
#140	0.11	30		
#200	0.075	24		

<u>Coefficients</u>	
D ₈₅ = 2.5492 mm	D ₃₀ = 0.1072 mm
D ₆₀ = 0.3247 mm	D ₁₅ = N/A
D ₅₀ = 0.2194 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

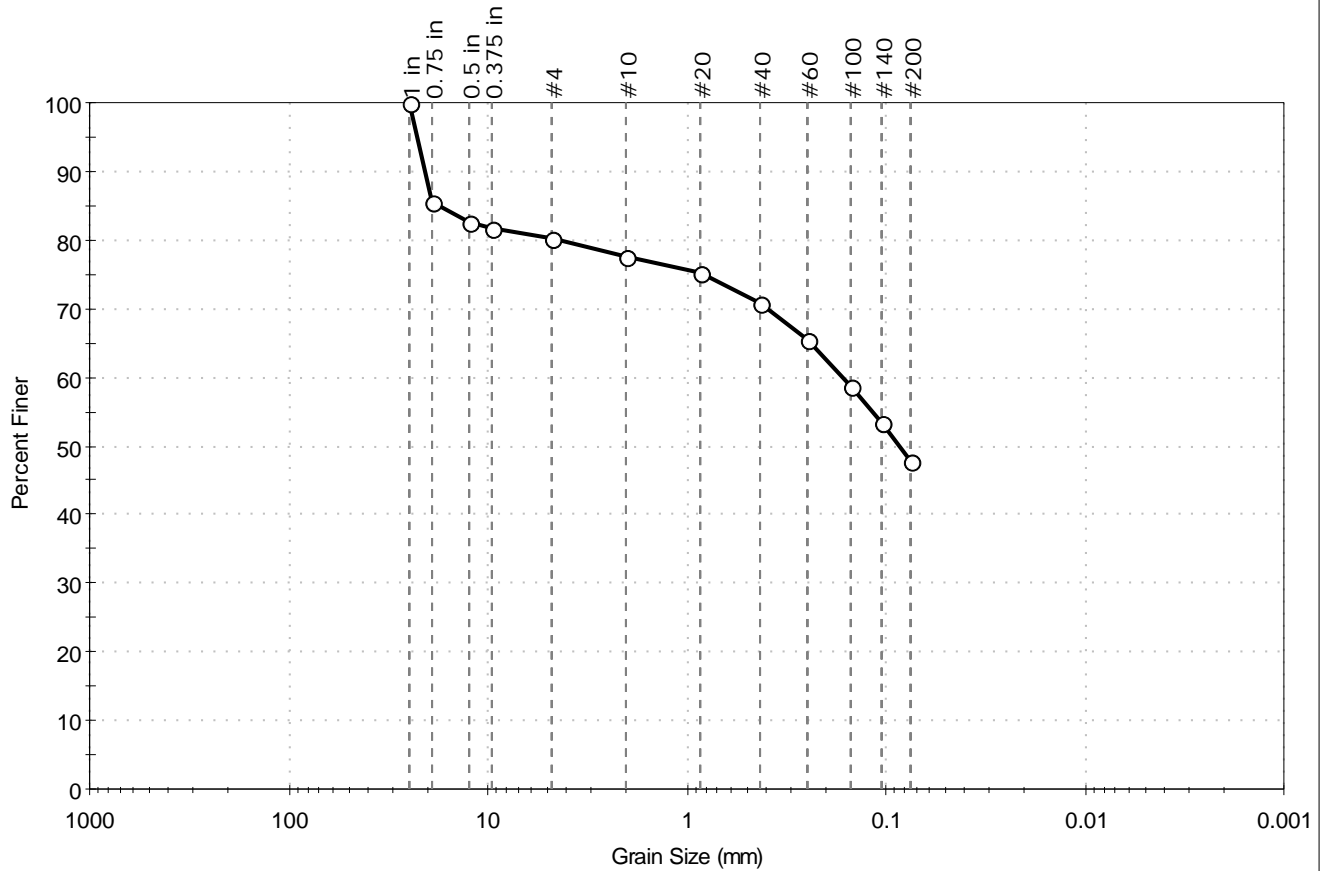
<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Gravel and Sand (A-2-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	GM2 Associates	Project No:	GTX-313139
Project:	Replace Bridge No. 04487		
Location:	Bristol, CT		
Boring ID:	B5	Sample Type:	bag
Sample ID:	S1	Test Date:	02/03/21
Depth:	1-3 ft	Test Id:	609344
Test Comment:	---		
Visual Description:	Moist, very dark brown silty sand with gravel		
Sample Comment:	---		

Particle Size Analysis - ASTM D6913



% Cobble	% Gravel	% Sand	% Silt & Clay Size
--	19.8	32.6	47.6

Sieve Name	Sieve Size, mm	Percent Finer	Spec. Percent	Complies
1 in	25.00	100		
0.75 in	19.00	86		
0.5 in	12.50	83		
0.375 in	9.50	82		
#4	4.75	80		
#10	2.00	78		
#20	0.85	75		
#40	0.42	71		
#60	0.25	65		
#100	0.15	59		
#140	0.11	53		
#200	0.075	48		

<u>Coefficients</u>	
D ₈₅ = 17.6423 mm	D ₃₀ = N/A
D ₆₀ = 0.1666 mm	D ₁₅ = N/A
D ₅₀ = 0.0862 mm	D ₁₀ = N/A
C _u = N/A	C _c = N/A

<u>Classification</u>	
ASTM	N/A
AASHTO	Silty Soils (A-4 (0))

<u>Sample/Test Description</u>
Sand/Gravel Particle Shape : ANGULAR
Sand/Gravel Hardness : HARD



Client:	GM2 Associates		
Project:	Replace Bridge No. 04487		
Location:	Bristol, CT	Project No:	GTX-313139
Boring ID:	---	Sample Type:	---
Sample ID:	---	Test Date:	02/17/21
Depth :	---	Test Id:	609346

**Bulk Density and Compressive Strength
of Rock Core Specimens by ASTM D7012 Method C**

Boring ID	Sample Number	Depth	Bulk Density, pcf	Compressive strength, psi	Failure Type	Meets ASTM D4543	Note(s)
B2	C2	19-20 ft	167	16988	1	Yes	---
B3	C1	11-12 ft	169	14620	1	No	2,*

- Notes: Density determined on core samples by measuring dimensions and weight and then calculating.
 All specimens tested at the approximate as-received moisture content and at standard laboratory temperature.
 The axial load was applied continuously at a stress rate that produced failure in a test time between 2 and 15 minutes.
 Failure Type: 1 = Intact Material Failure; 2 = Discontinuity Failure; 3 = Intact Material and Discontinuity Failure
 (See attached photographs)
- 1: Best effort end preparation. See Tolerance report for details.
 - 2: The as-received core did not meet the ASTM side straightness tolerance due to irregularities in the sample as cored.
 - 3: Specimen L/D < 2.
 - 4: The as-received core did not meet the ASTM minimum diameter tolerance of 1.875 inches.
 - 5: Specimen diameter is less than 10 times maximum particle size.
 - 6: Specimen diameter is less than 6 times maximum particle size.

*Because the indicated tested specimens did not meet the ASTM D4543 standard tolerances, the results reported here may differ from those for a test specimen within tolerances.



Client:	GM2 Associates	Test Date:	2/16/2021
Project Name:	Replace Bridge No. 04487	Tested By:	kdp
Project Location:	Bristol, CT	Checked By:	smd
GTX #:	313139		
Boring ID:	B2		
Sample ID:	C2		
Depth:	19-20 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)			
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap \leq 0.02 in.? YES			
Specimen Length, in:	4.41	4.41	4.41	Maximum difference must be $<$ 0.020 in.			
Specimen Diameter, in:	1.97	1.97	1.97	Straightness Tolerance Met? YES			
Specimen Mass, g:	591.82						
Bulk Density, lb/ft ³ :	167						
Length to Diameter Ratio:	2.2						
		Minimum Diameter Tolerance Met?	YES				
		Length to Diameter Ratio Tolerance Met?	YES				

END FLATNESS AND PARALLELISM (Procedure FP1)															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00020	-0.00030	-0.00040
Diameter 2, in (rotated 90°)	-0.00020	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
												Difference between max and min readings, in: 0° = 0.00050 90° = 0.00020			
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00010	-0.00010	-0.00020	-0.00040
Diameter 2, in (rotated 90°)	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00010
													Difference between max and min readings, in: 0° = 0.0005 90° = 0.0002		
													Maximum difference must be $<$ 0.0020 in. Difference = \pm 0.00025		
													Flatness Tolerance Met? YES		

	<p>DIAMETER 1</p> <p>End 1: Slope of Best Fit Line: 0.00023 Angle of Best Fit Line: 0.01342</p> <p>End 2: Slope of Best Fit Line: 0.00023 Angle of Best Fit Line: 0.01326</p> <p>Maximum Angular Difference: 0.00016</p> <p>Parallelism Tolerance Met? YES Spherically Seated</p> <hr/> <p>DIAMETER 2</p> <p>End 1: Slope of Best Fit Line: 0.00006 Angle of Best Fit Line: 0.00327</p> <p>End 2: Slope of Best Fit Line: 0.00011 Angle of Best Fit Line: 0.00655</p> <p>Maximum Angular Difference: 0.00327</p> <p>Parallelism Tolerance Met? YES Spherically Seated</p>
--	---

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)						Maximum angle of departure must be \leq 0.25°	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00050	1.970	0.00025	0.015	YES		
Diameter 2, in (rotated 90°)	0.00020	1.970	0.00010	0.006	YES		
						Perpendicularity Tolerance Met? YES	
END 2							
Diameter 1, in	0.00050	1.970	0.00025	0.015	YES		
Diameter 2, in (rotated 90°)	0.00020	1.970	0.00010	0.006	YES		

Client:	GM2 Associates
Project Name:	Replace Bridge No. 04487
Project Location:	Bristol, CT
GTX #:	313139
Test Date:	2/17/2021
Tested By:	cmh
Checked By:	smd
Boring ID:	B2
Sample ID:	C2
Depth, ft:	19-20



After cutting and grinding



After break



Client:	GM2 Associates	Test Date:	2/16/2021
Project Name:	Replace Bridge No. 04487	Tested By:	kdp
Project Location:	Bristol, CT	Checked By:	smd
GTX #:	313139		
Boring ID:	B3		
Sample ID:	C1		
Depth:	11-12 ft		
Visual Description:	See photographs		

UNIT WEIGHT DETERMINATION AND DIMENSIONAL AND SHAPE TOLERANCES OF ROCK CORE SPECIMENS BY ASTM D4543

BULK DENSITY				DEVIATION FROM STRAIGHTNESS (Procedure S1)			
	1	2	Average	Maximum gap between side of core and reference surface plate: Is the maximum gap \leq 0.02 in.? NO			
Specimen Length, in:	4.38	4.38	4.38	Maximum difference must be $<$ 0.020 in.			
Specimen Diameter, in:	1.96	1.96	1.96	Straightness Tolerance Met? NO			
Specimen Mass, g:	587.28						
Bulk Density, lb/ft ³ :	169						
Length to Diameter Ratio:	2.2	Minimum Diameter Tolerance Met?	YES				
		Length to Diameter Ratio Tolerance Met?	YES				

END FLATNESS AND PARALLELISM (Procedure FP1)															
END 1	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	-0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	-0.00010	-0.00010	-0.00010	-0.00010	-0.00020
	Difference between max and min readings, in: 0° = 0.00010 90° = 0.00020														
END 2	-0.875	-0.750	-0.625	-0.500	-0.375	-0.250	-0.125	0.000	0.125	0.250	0.375	0.500	0.625	0.750	0.875
Diameter 1, in	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Diameter 2, in (rotated 90°)	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00010	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Difference between max and min readings, in: 0° = 0 90° = 0.0001 Maximum difference must be $<$ 0.0020 in. Difference = \pm 0.00010														
	Flatness Tolerance Met? YES														

	<p>DIAMETER 1</p> <p>End 1: Slope of Best Fit Line: 0.00002 Angle of Best Fit Line: 0.00115</p> <p>End 2: Slope of Best Fit Line: 0.00000 Angle of Best Fit Line: 0.00000</p> <p>Maximum Angular Difference: 0.00115</p> <p>Parallelism Tolerance Met? YES Spherically Seated</p> <hr/> <p>DIAMETER 2</p> <p>End 1: Slope of Best Fit Line: 0.00008 Angle of Best Fit Line: 0.00442</p> <p>End 2: Slope of Best Fit Line: 0.00008 Angle of Best Fit Line: 0.00442</p> <p>Maximum Angular Difference: 0.00000</p> <p>Parallelism Tolerance Met? YES Spherically Seated</p>
--	---

PERPENDICULARITY (Procedure P1) (Calculated from End Flatness and Parallelism measurements above)						Maximum angle of departure must be \leq 0.25°	
END 1	Difference, Maximum and Minimum (in.)	Diameter (in.)	Slope	Angle°	Perpendicularity Tolerance Met?		
Diameter 1, in	0.00010	1.960	0.00005	0.003	YES		
Diameter 2, in (rotated 90°)	0.00020	1.960	0.00010	0.006	YES	Perpendicularity Tolerance Met?	YES
END 2							
Diameter 1, in	0.00000	1.960	0.00000	0.000	YES		
Diameter 2, in (rotated 90°)	0.00010	1.960	0.00005	0.003	YES		

Client:	GM2 Associates
Project Name:	Replace Bridge No. 04487
Project Location:	Bristol, CT
GTX #:	313139
Test Date:	2/17/2021
Tested By:	cmh smd
Checked By:	11-12 ft
Boring ID:	B3
Sample ID:	C1
Depth, ft:	11-12



After cutting and grinding



After break

**710A/710L
Environmental Report
Replacement of East St Bridge No. 04487 over
Pequabuck River
Bristol,CT**

CT DOT Project No. 017-192

Completed for

GM2Associates, Inc.
115 Glastonbury Boulevard
Glastonbury, CT 06033

Completed by

Comprehensive Environmental Inc.
1 Hartford Square-East, Suite 227
New Britain, CT 06052

May 19, 2021



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3.0	Analysis and Conclusions.....	3-1
3.1	Recommendations and Budget Estimates.....	3-1

Appendices

Appendix A	East Street Site Locus Map
Appendix B	Sample Locations and Existing Conditions Survey
Appendix C	Osprey Hazardous Materials Report
Appendix D	Asbestos Licenses
Appendix E	Sample Location Photolog

1.0 Introduction

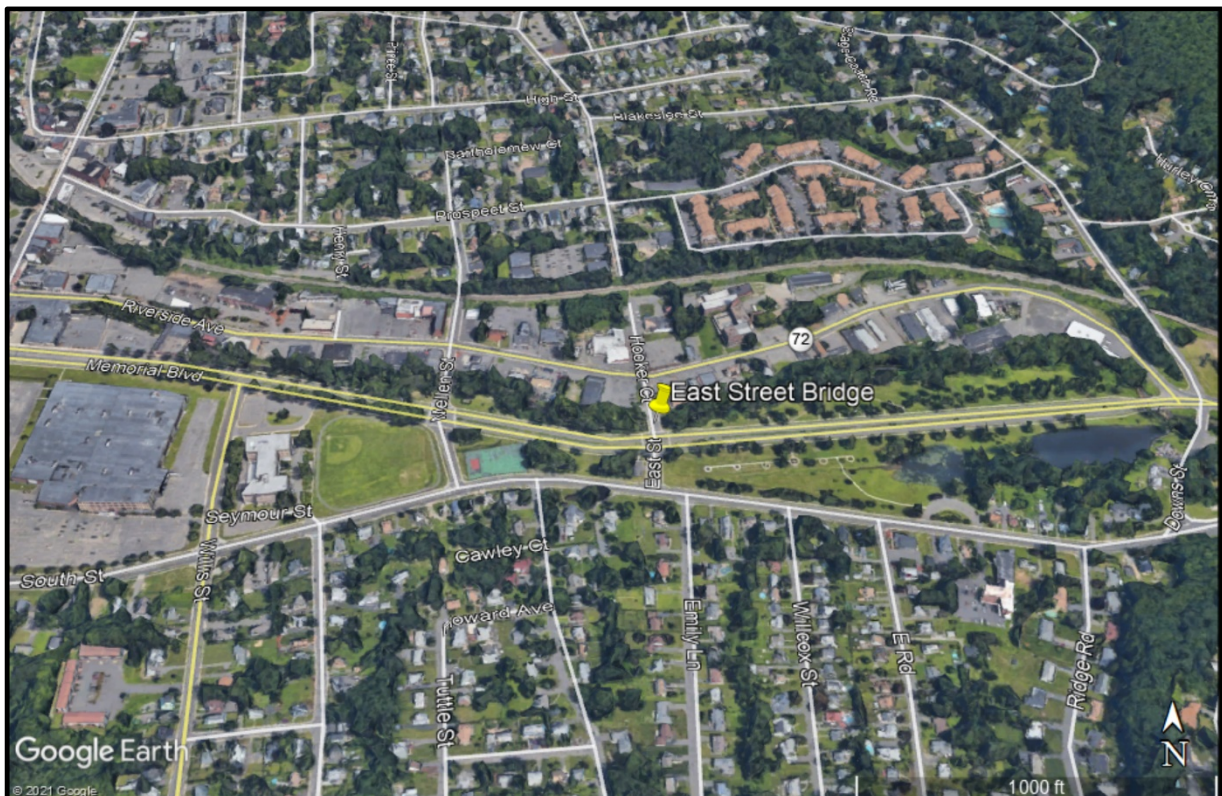
The GM2 Associates, Inc. retained Comprehensive Environmental Inc. (CEI) to prepare an environmental report regarding the presence of lead paint, PCBs, asbestos and other environmental hazards at the East Street Bridge over the Pequabuck River in Bristol, Connecticut. The existing bridge is planned for an entire replacement and as such extensive demolition debris will be generated for the bridge. This report is prepared to comply with Connecticut DOT environmental assessment task 710 A and 710 L.

1.1 Project Overview

CEI is providing the following scope of services in the furtherance of this report. The scope of work includes the following:

- Preliminary site data review
- Health and safety plan for on-site workers
- QA/QC practices
- Site inspection and sampling for asbestos containing material (ACM)
- Site inspection and sampling for lead-based paint (LBP)
- Site Inspection for other environmental hazards (Guano, etc.)
- Preparation of a draft and final report including budgetary costs for abatement or disposal of lead-based paint and asbestos

Below is an aerial view of the East Street Bridge (#04487) over the Pequabuck River in Bristol, CT. A Site Locus Map is included in **Appendix A – Site Locus Map**.



2.0 Field Activities

2.1 Site Investigation

On April 08, 2021 CEI staff mobilized to aid in the inspection activities and in the taking of representative samples for lead-based paint, PCBs, and asbestos. The water level and flow of the Pequabuck River were minimal and favorable for the inspection. The weather was approximately 65 degrees Fahrenheit and sunny. Ladders were used to obtain samples where appropriate.

The CEI team consisted of one project scientist, Thomas McCarthy, who accompanied Robert Grabarek, PE an asbestos certified planner and investigator. His credentials are included in **Appendix D** of this report. There are no credentials for the sampling of lead-based paint. All staff on-site are 40-hour hazardous waste certified.

Before the start of field activities, the CEI health and safety plan were reviewed by all members of the team. There were no health or safety issues during the site investigation. Before the onset of field operations CEI staff reviewed the site and existing bridge information provided by GM2 Associates. This information was a simple plan view detailing basic existing site conditions. No other detailed existing information was provided.

Sample locations shown in **Appendix B**. A photolog of select sample locations is included in **Appendix E**.

Approximately 12 samples from 4 locations were analyzed for the presence of asbestos. Samples ES1 through ES4 were analyzed and found to contain no asbestos. Approximately 9 samples from 3 locations were analyzed for the presence of PCBs. Samples ES1 through ES3 were analyzed and found to contain no PCBs. See a summary of results below:

Sample ID	Location	Material	Analysis	Asbestos Results
ES1	East Street Bridge rail base caulk grey	Caulk grey	Asbestos/PCBs	Non-ACM
ES2	East Street Bridge parapet joint caulk grey	Caulk grey	Asbestos/PCBs	Non-ACM
ES3	East Street Bridge deck expansion joint caulk brown	Caulk grey	Asbestos/PCBs	Non-ACM
ES4	East Street Bridge deck underside	Gunite (sprey on concrete) grey	Asbestos	Non-ACM

In addition, 5 samples were taken for the presence of lead-based paint. The HUD definition of a lead-based paint is any paint >0.5%. The results are summarized below:

Sample ID	Location	Total Lead (%)	TCLP Lead (mg/L)	Total PCBs (mg/kg)
ES1	East Street Bridge rail base caulk grey	ND<1.0	0.041	ND<0.40
ES2	East Street Bridge parapet joint caulk grey	ND<1.0	ND<0.013	ND<0.40
ES3	East Street Bridge deck expansion joint caulk brown	ND<1.0	ND<0.013	ND<0.40
ES RP1	East Street Bridge rail paint brown	ND<1.0		
ES RP2	East Street Bridge rail paint grey	6.7		

Based on the above analyses, the paint on the bridge railings only is lead based paint. No other hazardous materials were observed during the evaluation.

Laboratory data reports are included as part of the full Hazardous Materials Report by Osprey and are provided in **Appendix C**.

3.0 Analysis and Conclusions

3.1 Recommendations and Budget Estimates

ACMs were not found within/on any of the sampled materials from the East Street Bridge.

Lead based grey paint was found on the bridge railings (ES RP2 – 6.7%) above the HUD threshold of >0.5% for the East Street Bridge. Due to their age and limited quantity, these railings should be recycled as to avoid their paint waste from being classification as a hazardous waste.

PCBs were not found in any of the collected caulk samples from the East Street Bridge.

No other regulated items of concern (e.g. guano) were noted at the time of inspection.

Any workers dealing with the lead paint must comply with OSHA 29CFR 1926.62 – “Lead in Construction”.

Summary of Recommendations

There will be one waste stream generated by demolition of the **East Street Bridge**:

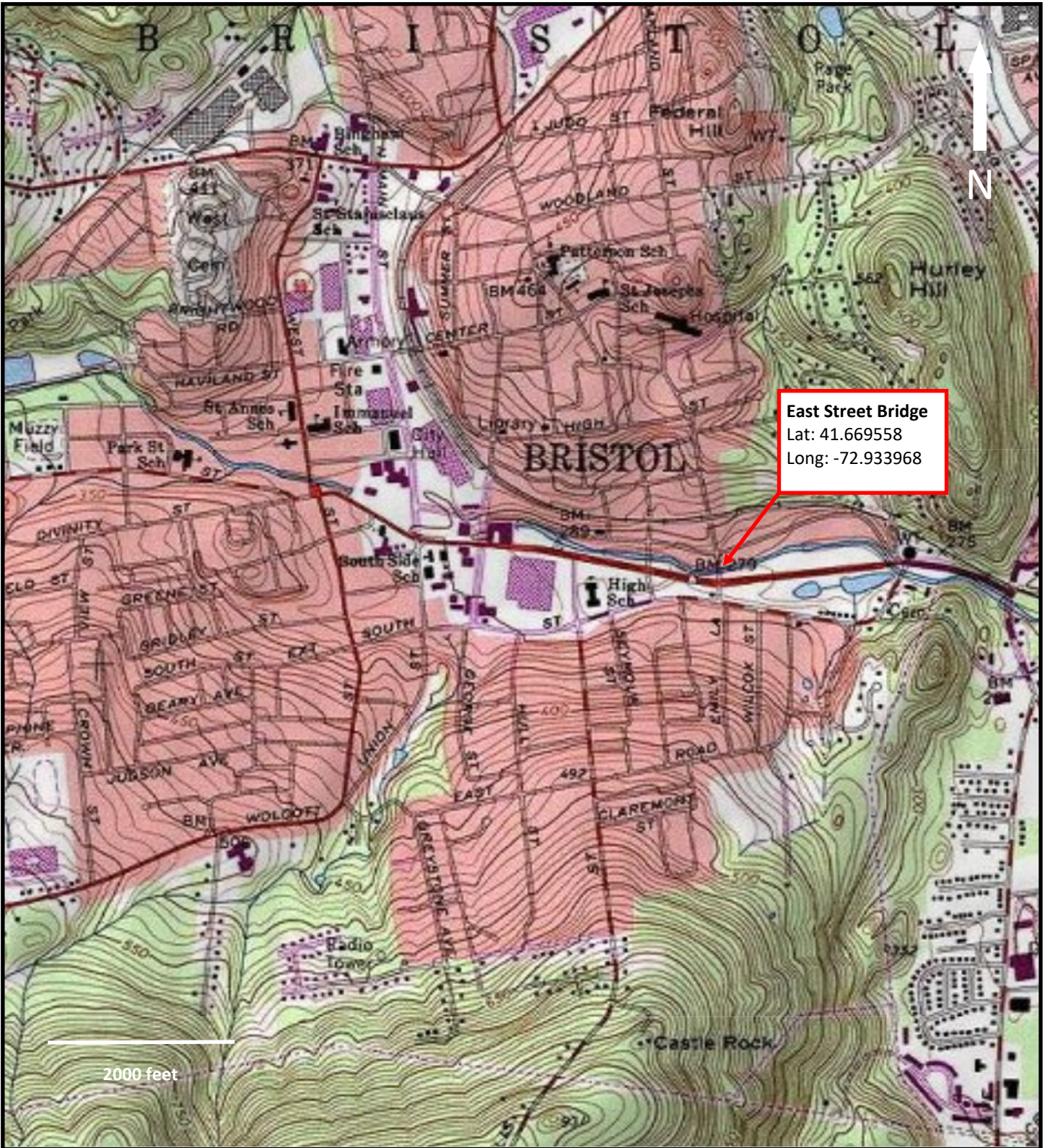
The grey rail paint (ES RP2) will not likely need to be dealt with as hazardous waste as the whole railing will be recycled as part of bridge demolition and thus will not constitute a hazardous waste itself. No TCLP lead testing was completed for this paint. Any lead paint chips generated by the removal of the railing will have to be tested and will likely need to be disposed of as hazardous waste. The cost for this item would be less than \$1,000.

There should be no additional cost for the recycling of the steel material and the same cost should be included in the overall cost for bridge demolition. The recycling of materials is part of any demolition project and is strongly encouraged by the State of Connecticut.

CEI senior personnel performed a QA/QC review in accordance with the company manual.

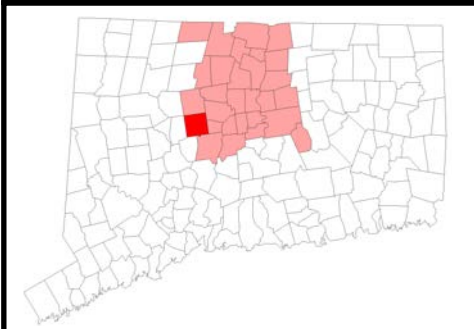
Appendix C - Existing Conditions Survey

Appendix E – Osprey Hazardous Materials Report



East Street Bridge
 Lat: 41.669558
 Long: -72.933968

2000 feet



Comprehensive Environmental Inc.

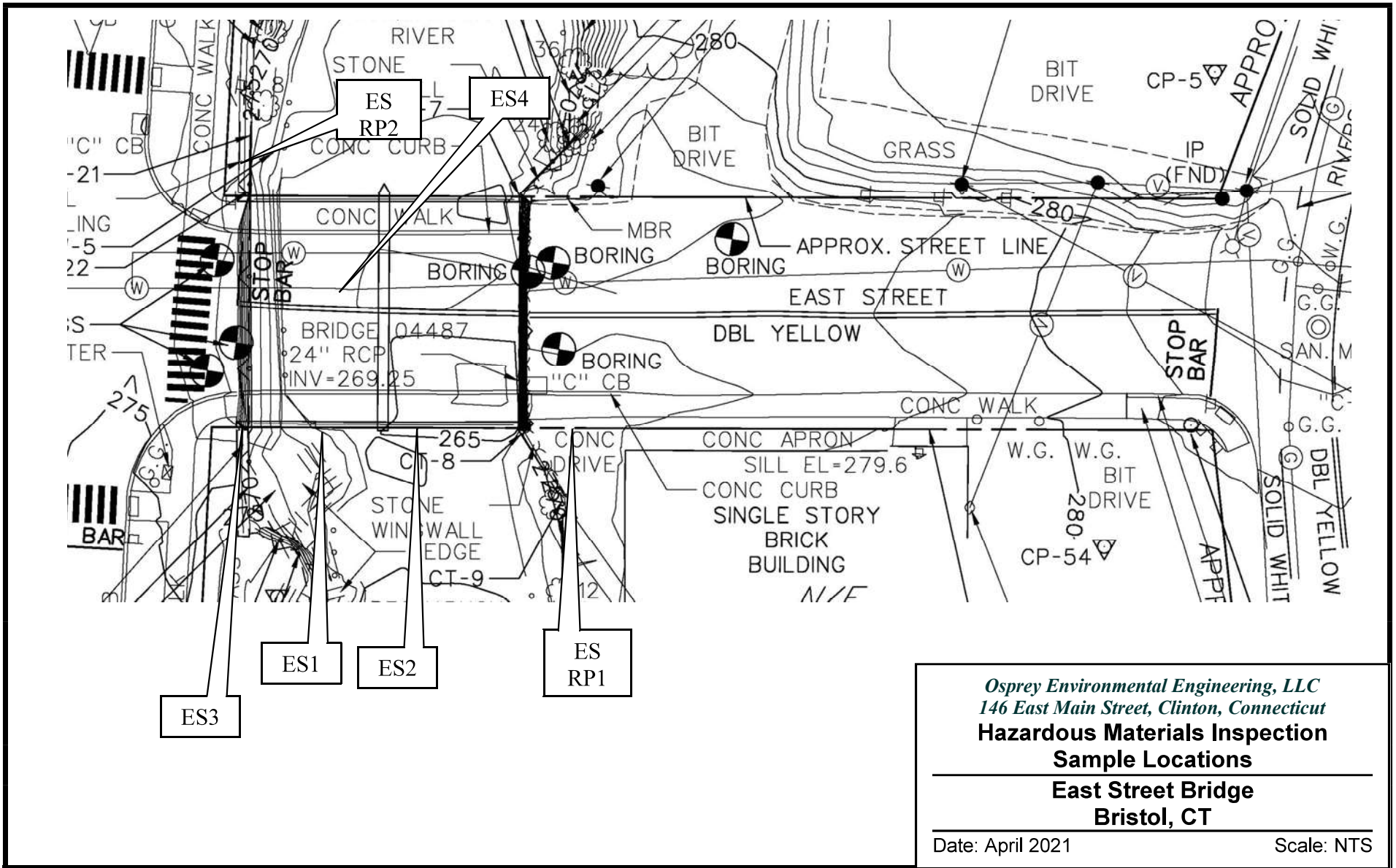
Figure 1

East Street Bridge Site Locus Map

Asbestos, PCB, Lead Paint
 Survey

Bristol, Connecticut

**Appendix B – Sample Locations and
Existing Site Conditions and
Existing Conditions Survey**



Osprey Environmental Engineering, LLC
 146 East Main Street, Clinton, Connecticut
Hazardous Materials Inspection
Sample Locations

East Street Bridge
Bristol, CT

 Date: April 2021 Scale: NTS

Appendix C – Osprey Hazardous Materials Report



OSPREY ENVIRONMENTAL ENGINEERING, LLC

146 East Main Street Clinton, CT 06413

Phone: 860.669.8651

Sebastian Amenta, P.E., Regional Program Director
Comprehensive Environmental Inc.
1 Hartford Square, Suite 227
New Britain, CT 06052

30 April 2021

Re: Hazardous Materials Survey – Pequabuck River Bridge Spans
East Street Bridge and Mellen Street Bridge, Bristol, CT

Robert Grabarek of Osprey, a Connecticut Licensed Asbestos Inspector, conducted a hazardous materials survey for the above referenced bridges on 09 April 2021. The survey was conducted to identify all asbestos containing materials, lead paint, and PCB materials as well as other environmental hazards including guano, spills, etc. present at the structures in the areas shown on the attached drawings. The survey included the collection of samples of all suspect asbestos containing materials in accordance with State and Federal sampling requirements. Asbestos samples were submitted to EMSL, Inc., an NVLAP/AIHA accredited laboratory and were analyzed by polarized light microscopy to determine whether the materials met the definition of asbestos containing materials (>1% asbestos). Lead and PCB samples were submitted to Complete Environmental Services, Inc. of Stratford, CT. A summary table of findings and plans indicating sampling locations are appended.

A minimum of three samples was taken for each of nine suspected asbestos containing materials. Of these, the following were asbestos containing materials.

<i>ID</i>	<i>Location</i>	<i>Asbestos Containing Material</i>	<i>Quantity</i>
MS2	Mellen Street Bridge deck/abutment connection	Bituminous tar black adjacent to bit. sheet	*
NP3	Mellen Street Bridge rail support risers	Base caulk brown at base plates	5 s.f.

* The quantity of asbestos-containing bituminous tar caulk at the Mellen Street Bridge could not be quantified due to visual limitations. It appeared that the caulk was present where the abutments met the exterior bridge concrete base beam/sub-parapet wall. If it is limited to those areas the area of the caulk may be limited to approximately 12 square feet at each of the four contact points, however this could not be ascertained

Samples with no asbestos present were as follows:

<i>ID</i>	<i>Location</i>	<i>Material (no asbestos present)</i>
ES1	East Street Bridge rail base	Caulk grey
ES2	East Street Bridge parapet joint	Caulk grey
ES3	East Street Bridge deck expansion joint	Caulk brown
ES4	East Street Bridge deck underside	Gunite (spray on concrete) grey
MS1	Mellen Street Bridge deck/abutment connection	Bituminous sheet black
NP4	Mellen Street Bridge parapet joint	Caulk black
NP5	Mellen Street Bridge girder support base	Bearing pad brown/orange woven

Lead and PCB analyses produced the following information on lead based paint:

<i>ID</i>	<i>Location</i>	<i>Total Lead (%)</i>	<i>TCLP Lead (mg/l)</i>	<i>Total PCBs (mg/kg)</i>
ES1	East Street Bridge rail base caulk grey	ND <0.10	0.041	ND<0.40
ES2	East Street Bridge parapet joint caulk grey	ND <0.10	ND<0.013	ND<0.40
ES3	East Street Bridge deck expansion joint caulk brown	ND <0.10	ND<0.013	ND<0.40
ES RP1	East Street Bridge rail paint brown	ND <0.10		
ES RP2	East Street Bridge rail paint grey	6.7		
MS1	Mellen Street Bridge bituminous sheet black		0.031	ND<0.40
MS2	Mellen Street Bridge bituminous tar black		0.19	ND<0.40
NP3	Mellen Street Bridge rail base caulk brown	4.5	84	0.25
NP4	Mellen Street Bridge parapet joint caulk black	0.21	3.2	ND<0.40
NP5	Mellen Street Bridge bearing pad orange/brown woven			
NR1	Mellen Street Bridge girder paint brown/orange	55	430	
NR2	Mellen Street Bridge rail paint brown/orange	22		

The HUD definition of a lead based paint is any paint >0.5%. Based on the above analyses, the paint on the bridge girders and railings for both bridges are lead based paint. The paints are have elevated TCLP lead levels. The threshold for a US Environmental Protection Agency (EPA) characteristic hazardous waste for lead is 5.0 mg/l. Most of the railings and girders have elevated lead levels and therefore should be treated as hazardous wastes if the metals are not to be recycled.

PCBs were present in one rail base caulk at 0.25 mg/kg. This is well under EPA TSCA regulatory threshold of 50 parts per million (mg/kg). That caulk meets the definition of a hazardous waste based on TCLP lead concentration and therefore will need to be treated as a regulated waste irrespective of the PCB content.

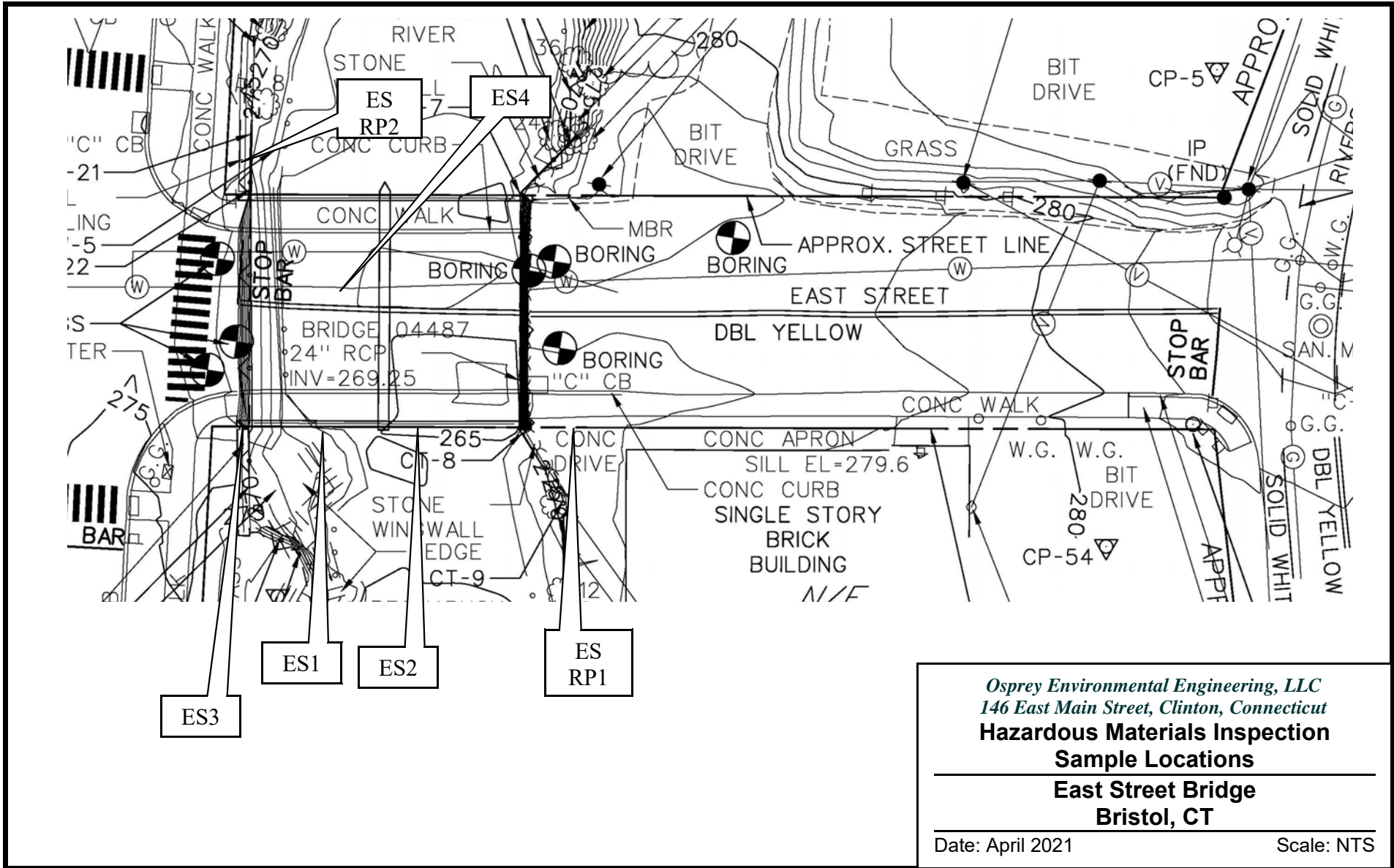
No guano, spills or environmental releases or other hazardous materials were noted during this inspection.

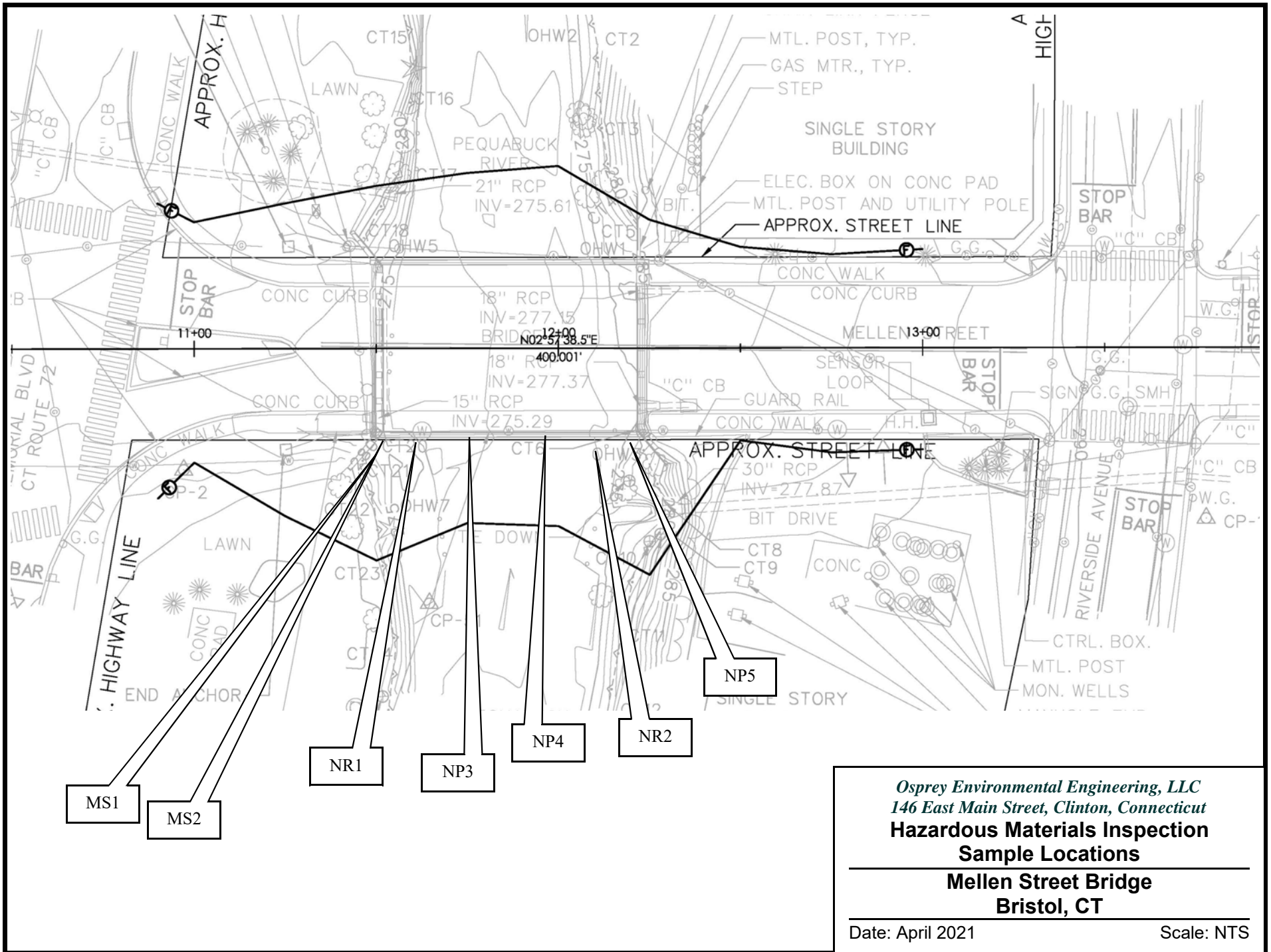
Should you have any questions regarding the above, please contact me.

Sincerely,
Osprey Environmental Engineering, LLC



Robert Grabarek, P.E., L.S., LEP
President





Osprey Environmental Engineering, LLC
 146 East Main Street, Clinton, Connecticut
Hazardous Materials Inspection
Sample Locations
Mellen Street Bridge
Bristol, CT
 Date: April 2021 Scale: NTS



EMSL Analytical, Inc.

165 Gracey Avenue Meriden, CT 06451

Tel/Fax: (203) 284-5948 / (203) 284-5978

<http://www.EMSL.com> / wallingfordlab@emsl.com

EMSL Order: 242102039

Customer ID: OSPR52

Customer PO:

Project ID:

Attention: Robert Grabarek
Osprey Environmental Engineering, LLC
146 East Main Street
Clinton, CT 06413

Phone: (860) 669-8651

Fax: (860) 664-3751

Received Date: 04/19/2021 2:40 PM

Analysis Date: 04/26/2021

Collected Date: 04/09/2021

Project: ASBESTOS SURVEY-EAST ST. & MELLEN STREET, BRISTOL, CT

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
1A 242102039-0001	ES1-EAST ST BRIDGE - RAIL BASE CAULK GREY	Gray/White Non-Fibrous Homogeneous	2% Fibrous (Other)	98% Non-fibrous (Other)	None Detected
1B 242102039-0002	ES1-EAST ST BRIDGE - RAIL BASE CAULK GREY	Gray/White Non-Fibrous Homogeneous	2% Fibrous (Other)	98% Non-fibrous (Other)	None Detected
1C 242102039-0003	ES1-EAST ST BRIDGE - RAIL BASE CAULK GREY	Gray Non-Fibrous Homogeneous	2% Fibrous (Other)	98% Non-fibrous (Other)	None Detected
2A 242102039-0004	ES2-EAST ST BRIDGE - PARAPET JOINT CAULK GREY	White/Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
2B 242102039-0005	ES2-EAST ST BRIDGE - PARAPET JOINT CAULK GREY	White/Black Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
2C 242102039-0006	ES2-EAST ST BRIDGE - PARAPET JOINT CAULK GREY	White Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
3A 242102039-0007	ES3-EAST ST BRIDGE - DECK EXPANSION JOINT CAULK BROWN	Brown Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected
3B 242102039-0008	ES3-EAST ST BRIDGE - DECK EXPANSION JOINT CAULK BROWN	Brown Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected
3C 242102039-0009	ES3-EAST ST BRIDGE - DECK EXPANSION JOINT CAULK BROWN	Brown Fibrous Homogeneous	60% Cellulose	40% Non-fibrous (Other)	None Detected
4A 242102039-0010	ES4-EAST ST BRIDGE - DECK UNDERSIDE GUNITES GREY	Gray Non-Fibrous Homogeneous		6% Quartz 94% Non-fibrous (Other)	None Detected
4B 242102039-0011	ES4-EAST ST BRIDGE - DECK UNDERSIDE GUNITES GREY	Gray Non-Fibrous Homogeneous		7% Quartz 93% Non-fibrous (Other)	None Detected
4C 242102039-0012	ES4-EAST ST BRIDGE - DECK UNDERSIDE GUNITES GREY	Gray Non-Fibrous Homogeneous	2% Cellulose	8% Quartz 90% Non-fibrous (Other)	None Detected
5A 242102039-0013	MS1-MELLEN ST BRIDGE - BITUMINOUS SHEET BLACK	Black Non-Fibrous Homogeneous	15% Cellulose	85% Non-fibrous (Other)	None Detected
5B 242102039-0014	MS1-MELLEN ST BRIDGE - BITUMINOUS SHEET BLACK	Black Non-Fibrous Homogeneous	15% Cellulose	85% Non-fibrous (Other)	None Detected

Initial report from: 04/26/2021 14:31:10



EMSL Analytical, Inc.

165 Gracey Avenue Meriden, CT 06451

Tel/Fax: (203) 284-5948 / (203) 284-5978

<http://www.EMSL.com> / wallingfordlab@emsl.com

EMSL Order: 242102039
Customer ID: OSPR52
Customer PO:
Project ID:

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Description	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
5C 242102039-0015	MS1-MELLEN ST BRIDGE - BITUMINOUS SHEET BLACK	Black Non-Fibrous Homogeneous	15% Cellulose	85% Non-fibrous (Other)	None Detected
6A 242102039-0016	MS2-MELLEN ST BRIDGE - BITUMINOUS TAR BLACK	Black Non-Fibrous Homogeneous		88% Non-fibrous (Other)	12% Chrysotile
6B 242102039-0017	MS2-MELLEN ST BRIDGE - BITUMINOUS TAR BLACK				Positive Stop (Not Analyzed)
6C 242102039-0018	MS2-MELLEN ST BRIDGE - BITUMINOUS TAR BLACK				Positive Stop (Not Analyzed)
7A 242102039-0019	NP3-MELLEN ST BRIDGE - RAIL BASE CAULK BROWN	Gray/Rust Non-Fibrous Homogeneous		92% Non-fibrous (Other)	8% Chrysotile
7B 242102039-0020	NP3-MELLEN ST BRIDGE - RAIL BASE CAULK BROWN				Positive Stop (Not Analyzed)
7C 242102039-0021	NP3-MELLEN ST BRIDGE - RAIL BASE CAULK BROWN				Positive Stop (Not Analyzed)
8A 242102039-0022	NP4-MELLEN ST BRIDGE - PARAPET JOINT CAULK BLACK	Black Non-Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
8B 242102039-0023	NP4-MELLEN ST BRIDGE - PARAPET JOINT CAULK BLACK	Black Non-Fibrous Homogeneous	10% Cellulose	90% Non-fibrous (Other)	None Detected
8C 242102039-0024	NP4-MELLEN ST BRIDGE - PARAPET JOINT CAULK BLACK	Black Non-Fibrous Homogeneous	15% Cellulose	85% Non-fibrous (Other)	None Detected
9A 242102039-0025	NP5-MELLEN ST BRIDGE - BEARING PAD ORANGE WOVEN	Orange Fibrous Homogeneous	40% Cellulose	60% Non-fibrous (Other)	None Detected
9B 242102039-0026	NP5-MELLEN ST BRIDGE - BEARING PAD ORANGE WOVEN	Orange Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected
9C 242102039-0027	NP5-MELLEN ST BRIDGE - BEARING PAD ORANGE WOVEN	Orange Fibrous Homogeneous	80% Cellulose	20% Non-fibrous (Other)	None Detected

Initial report from: 04/26/2021 14:31:10



EMSL Analytical, Inc.

165 Gracey Avenue Meriden, CT 06451

Tel/Fax: (203) 284-5948 / (203) 284-5978

<http://www.EMSL.com> / wallingfordlab@emsl.com

EMSL Order: 242102039

Customer ID: OSPR52

Customer PO:

Project ID:

Analyst(s)

Danny Sandhu (3)

Leslie Tetrick (8)

Tara Svendsen (12)

Danny Sandhu, Asbestos Laboratory Manager
or Other Approved Signatory

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Samples analyzed by EMSL Analytical, Inc. Meriden, CT NVLAP Lab Code 200700-0.

Initial report from: 04/26/2021 14:31:10

242102039

OSPREY ENVIRONMENTAL ENGINEERING 146 EAST MAIN STREET, CLINTON CT 06413 860 669 8651
 Asbestos Survey- East St & Mellen Street, Bristol, CT 04/09/21

NOTES: Stop positive.



SAMPLE ID	Item	Loc.	Comments
1	A-C ES1	East St Bridge	Rail base caulk grey
2	A-C ES2	East St Bridge	Parapet joint caulk grey
3	A-C ES3	East St Bridge	Deck expansion joint caulk brown
4	A-C ES4	East St Bridge	Deck underside gunitite grey
5	A-C MS1	Mellen St Bridge	Bituminous sheet black
6	A-C MS2	Mellen St Bridge	Bituminous tar black
7	A-C NP3	Mellen St Bridge	Rail base caulk brown
8	A-C NP4	Mellen St Bridge	Parapet joint caulk black
9	A-C NP5	Mellen St Bridge	Bearing pad orange woven



Client: Mr. Robert Grabarek
Osprey Enviromental
146 East Main St
Clinton, CT 06413

Analytical Report

CET# 1040278

Report Date: April 16, 2021
Project: Bridges, Bristol

Connecticut Laboratory Certificate: PH 0116
Massachusetts Laboratory Certificate: M-CT903
Rhode Island Laboratory Certificate: 199



New York NELAP Accreditation: 11982
Pennsylvania Certificate: 68-02927

SAMPLE SUMMARY

The sample(s) were received at 3.4°C.

This report contains analytical data associated with following samples only.

Sample ID	Laboratory ID	Matrix	Collection Date/Time	Receipt Date
ES1	1040278-01	Caulk	4/08/2021 11:00	04/09/2021
ES2	1040278-02	Caulk	4/08/2021 11:00	04/09/2021
ES3	1040278-03	Solid	4/08/2021 11:00	04/09/2021
ESRP1	1040278-04	Paint Chip	4/08/2021 11:00	04/09/2021
ESRP2	1040278-05	Paint Chip	4/08/2021 11:00	04/09/2021
MS1	1040278-06	Solid	4/08/2021 11:00	04/09/2021
MS2	1040278-07	Solid	4/08/2021 11:00	04/09/2021
NR1	1040278-08	Paint Chip	4/08/2021 11:00	04/09/2021
NR2	1040278-09	Paint Chip	4/08/2021 11:00	04/09/2021
NP3	1040278-10	Solid	4/08/2021 11:00	04/09/2021
NP4	1040278-11	Solid	4/08/2021 11:00	04/09/2021

CET # : 1040278

Project: Bridges, Bristol

Analyte: Total Lead [EPA 6010C]

Analyst: SS

Prep: EPA 3051A

Matrix: Caulk

Laboratory ID	Client Sample ID	Result	RL	Units	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1040278-01	ES1	ND	0.10	%	1	B1D1405	04/14/2021	04/14/2021 15:19	
1040278-02	ES2	ND	0.10	%	1	B1D1405	04/14/2021	04/14/2021 15:23	
1040278-03	ES3	ND	0.10	%	1	B1D1405	04/14/2021	04/14/2021 15:58	
1040278-04	ESRP1	ND	0.10	%	1	B1D1405	04/14/2021	04/14/2021 16:03	
1040278-05	ESRP2	6.7	0.10	%	1	B1D1405	04/14/2021	04/14/2021 16:07	
1040278-08	NR1	55	10	%	100	B1D1405	04/14/2021	04/15/2021 13:44	
1040278-09	NR2	22	10	%	100	B1D1405	04/14/2021	04/15/2021 13:49	
1040278-10	NP3	4.5	0.10	%	1	B1D1405	04/14/2021	04/14/2021 16:20	
1040278-11	NP4	0.21	0.10	%	1	B1D1405	04/14/2021	04/14/2021 16:24	

Analyte: TCLP Lead [EPA 6020A]

Analyst: SS

Prep: EPA 3005A-1311

Matrix: Extract

Laboratory ID	Client Sample ID	Result	RL	Units	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1040278-01	ES1	0.041	0.013	mg/L	1	B1D1425	04/14/2021	04/14/2021 18:37	
1040278-02	ES2	ND	0.013	mg/L	1	B1D1425	04/14/2021	04/14/2021 18:42	
1040278-03	ES3	ND	0.013	mg/L	1	B1D1425	04/14/2021	04/14/2021 18:46	
1040278-06	MS1	0.031	0.013	mg/L	1	B1D1425	04/14/2021	04/14/2021 18:51	
1040278-07	MS2	0.19	0.013	mg/L	1	B1D1425	04/14/2021	04/14/2021 19:11	
1040278-08	NR1	430	0.013	mg/L	1	B1D1425	04/14/2021	04/14/2021 19:16	
1040278-10	NP3	84	0.013	mg/L	1	B1D1425	04/14/2021	04/14/2021 19:20	
1040278-11	NP4	3.2	0.013	mg/L	1	B1D1425	04/14/2021	04/14/2021 19:25	

CET # : 1040278
Project: Bridges, Bristol

Client Sample ID ES1

Lab ID: 1040278-01

PCBs by Soxhlet
Method: EPA 8082A

Analyst: SMW
Matrix: Caulk

Analyte	Result (mg/kg (As Rec))	RL (mg/kg (As Rec))	Dilution	Prep Method	Batch	Prepared	Date/Time Analyzed	Notes
PCB-1016	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:03	
PCB-1221	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:03	
PCB-1232	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:03	
PCB-1242	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:03	
PCB-1248	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:03	
PCB-1254	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:03	
PCB-1260	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:03	
PCB-1268	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:03	
PCB-1262	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:03	
<i>Surrogate: TCMX [1C]</i>	<i>56.8 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 12:03</i>	
<i>Surrogate: TCMX [2C]</i>	<i>47.3 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 12:03</i>	
<i>Surrogate: DCB [1C]</i>	<i>77.3 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 12:03</i>	
<i>Surrogate: DCB [2C]</i>	<i>82.7 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 12:03</i>	

CET # : 1040278
Project: Bridges, Bristol

Client Sample ID ES2

Lab ID: 1040278-02

PCBs by Soxhlet
Method: EPA 8082A

Analyst: SMW
Matrix: Caulk

Analyte	Result (mg/kg (As Rec))	RL (mg/kg (As Rec))	Dilution	Prep Method	Batch	Prepared	Date/Time Analyzed	Notes
PCB-1016	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:22	
PCB-1221	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:22	
PCB-1232	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:22	
PCB-1242	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:22	
PCB-1248	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:22	
PCB-1254	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:22	
PCB-1260	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:22	
PCB-1268	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:22	
PCB-1262	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:22	
<i>Surrogate: TCMX [1C]</i>	<i>70.0 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 12:22</i>	
<i>Surrogate: TCMX [2C]</i>	<i>57.4 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 12:22</i>	
<i>Surrogate: DCB [1C]</i>	<i>86.0 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 12:22</i>	
<i>Surrogate: DCB [2C]</i>	<i>95.0 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 12:22</i>	

CET # : 1040278
Project: Bridges, Bristol

Client Sample ID ES3

Lab ID: 1040278-03

**PCBs by Soxhlet
Method: EPA 8082A**

**Analyst: JTS
Matrix: Solid**

Analyte	Result (mg/kg (As Rec))	RL (mg/kg (As Rec))	Dilution	Prep Method	Batch	Prepared	Date/Time Analyzed	Notes
PCB-1016	ND	0.10	1	EPA 3540C	B1D1225	04/12/2021	04/14/2021 19:09	
PCB-1221	ND	0.10	1	EPA 3540C	B1D1225	04/12/2021	04/14/2021 19:09	
PCB-1232	ND	0.10	1	EPA 3540C	B1D1225	04/12/2021	04/14/2021 19:09	
PCB-1242	ND	0.10	1	EPA 3540C	B1D1225	04/12/2021	04/14/2021 19:09	
PCB-1248	ND	0.10	1	EPA 3540C	B1D1225	04/12/2021	04/14/2021 19:09	
PCB-1254	ND	0.10	1	EPA 3540C	B1D1225	04/12/2021	04/14/2021 19:09	
PCB-1260	ND	0.10	1	EPA 3540C	B1D1225	04/12/2021	04/14/2021 19:09	
PCB-1268	ND	0.10	1	EPA 3540C	B1D1225	04/12/2021	04/14/2021 19:09	
PCB-1262	ND	0.10	1	EPA 3540C	B1D1225	04/12/2021	04/14/2021 19:09	
<i>Surrogate: TCMX [1C]</i>	<i>42.2 %</i>	<i>30 - 150</i>			B1D1225	04/12/2021	<i>04/14/2021 19:09</i>	
<i>Surrogate: TCMX [2C]</i>	<i>43.5 %</i>	<i>30 - 150</i>			B1D1225	04/12/2021	<i>04/14/2021 19:09</i>	
<i>Surrogate: DCB [1C]</i>	<i>44.1 %</i>	<i>30 - 150</i>			B1D1225	04/12/2021	<i>04/14/2021 19:09</i>	
<i>Surrogate: DCB [2C]</i>	<i>43.7 %</i>	<i>30 - 150</i>			B1D1225	04/12/2021	<i>04/14/2021 19:09</i>	

CET # : 1040278
Project: Bridges, Bristol

Client Sample ID MS1

Lab ID: 1040278-06

PCBs by Soxhlet
Method: EPA 8082A

Analyst: SMW
Matrix: Solid

Analyte	Result (mg/kg (As Rec))	RL (mg/kg (As Rec))	Dilution	Prep Method	Batch	Prepared	Date/Time Analyzed	Notes
PCB-1016	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:41	
PCB-1221	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:41	
PCB-1232	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:41	
PCB-1242	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:41	
PCB-1248	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:41	
PCB-1254	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:41	
PCB-1260	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:41	
PCB-1268	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:41	
PCB-1262	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 12:41	
<i>Surrogate: TCMX [1C]</i>	<i>33.2 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 12:41</i>	
<i>Surrogate: TCMX [2C]</i>	<i>35.2 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 12:41</i>	
<i>Surrogate: DCB [1C]</i>	<i>33.9 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 12:41</i>	
<i>Surrogate: DCB [2C]</i>	<i>36.0 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 12:41</i>	

CET # : 1040278
Project: Bridges, Bristol

Client Sample ID MS2

Lab ID: 1040278-07

PCBs by Soxhlet
Method: EPA 8082A

Analyst: SMW
Matrix: Solid

Analyte	Result (mg/kg (As Rec))	RL (mg/kg (As Rec))	Dilution	Prep Method	Batch	Prepared	Date/Time Analyzed	Notes
PCB-1016	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 13:01	
PCB-1221	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 13:01	
PCB-1232	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 13:01	
PCB-1242	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 13:01	
PCB-1248	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 13:01	
PCB-1254	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 13:01	
PCB-1260	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 13:01	
PCB-1268	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 13:01	
PCB-1262	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 13:01	
<i>Surrogate: TCMX [1C]</i>	<i>38.5 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 13:01</i>	
<i>Surrogate: TCMX [2C]</i>	<i>34.5 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 13:01</i>	
<i>Surrogate: DCB [1C]</i>	<i>32.5 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 13:01</i>	
<i>Surrogate: DCB [2C]</i>	<i>32.9 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 13:01</i>	

CET # : 1040278
Project: Bridges, Bristol

Client Sample ID NP3

Lab ID: 1040278-10

PCBs by ASE
Method: EPA 8082A

Analyst: MFJ
Matrix: Solid

Analyte	Result (mg/kg wet)	RL (mg/kg wet)	Dilution	Prep Method	Batch	Prepared	Date/Time Analyzed	Notes
PCB-1016	ND	0.10	1	EPA 3545A	B1D1239	04/12/2021	04/13/2021 19:09	
PCB-1221	ND	0.10	1	EPA 3545A	B1D1239	04/12/2021	04/13/2021 19:09	
PCB-1232	ND	0.10	1	EPA 3545A	B1D1239	04/12/2021	04/13/2021 19:09	
PCB-1242	ND	0.10	1	EPA 3545A	B1D1239	04/12/2021	04/13/2021 19:09	
PCB-1248	ND	0.10	1	EPA 3545A	B1D1239	04/12/2021	04/13/2021 19:09	
PCB-1254	0.25	0.10	1	EPA 3545A	B1D1239	04/12/2021	04/13/2021 19:09	
PCB-1260	ND	0.10	1	EPA 3545A	B1D1239	04/12/2021	04/13/2021 19:09	
PCB-1268	ND	0.10	1	EPA 3545A	B1D1239	04/12/2021	04/13/2021 19:09	
PCB-1262	ND	0.10	1	EPA 3545A	B1D1239	04/12/2021	04/13/2021 19:09	
<i>Surrogate: TCMX [1C]</i>	<i>53.4 %</i>	<i>30 - 150</i>			B1D1239	04/12/2021	<i>04/13/2021 19:09</i>	
<i>Surrogate: TCMX [2C]</i>	<i>51.0 %</i>	<i>30 - 150</i>			B1D1239	04/12/2021	<i>04/13/2021 19:09</i>	
<i>Surrogate: DCB [1C]</i>	<i>58.3 %</i>	<i>30 - 150</i>			B1D1239	04/12/2021	<i>04/13/2021 19:09</i>	
<i>Surrogate: DCB [2C]</i>	<i>63.6 %</i>	<i>30 - 150</i>			B1D1239	04/12/2021	<i>04/13/2021 19:09</i>	

CET # : 1040278
Project: Bridges, Bristol

Client Sample ID NP4

Lab ID: 1040278-11

PCBs by Soxhlet
Method: EPA 8082A

Analyst: SMW
Matrix: Solid

Analyte	Result (mg/kg (As Rec))	RL (mg/kg (As Rec))	Dilution	Prep Method	Batch	Prepared	Date/Time Analyzed	Notes
PCB-1016	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 14:36	
PCB-1221	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 14:36	
PCB-1232	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 14:36	
PCB-1242	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 14:36	
PCB-1248	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 14:36	
PCB-1254	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 14:36	
PCB-1260	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 14:36	
PCB-1268	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 14:36	
PCB-1262	ND	0.40	4	EPA 3540C	B1D1511	04/15/2021	04/16/2021 14:36	
<i>Surrogate: TCMX [1C]</i>	<i>33.2 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 14:36</i>	
<i>Surrogate: TCMX [2C]</i>	<i>31.3 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 14:36</i>	
<i>Surrogate: DCB [1C]</i>	<i>30.3 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 14:36</i>	
<i>Surrogate: DCB [2C]</i>	<i>28.7 %</i>	<i>30 - 150</i>			B1D1511	04/15/2021	<i>04/16/2021 14:36</i>	L

All questions related to this report should be directed to David Ditta, Timothy Fusco, or Robert Blake at 203-377-9984.

Sincerely,

This technical report was reviewed by Robert Blake



David Ditta
Laboratory Director



Project Manager

Report Comments:

Sample Result Flags:

- E- The result is estimated, above the calibration range.
- H- The surrogate recovery is above the control limits.
- L- The surrogate recovery is below the control limits.
- B- The compound was detected in the laboratory blank.
- P- The Relative Percent Difference (RPD) of dual column analyses exceeds 40%.
- D- The RPD between the sample and the sample duplicate is high. Sample Homogeneity may be a problem.
- + - The Surrogate was diluted out.
- *C1- The Continuing Calibration did not meet method specifications and was biased low for this analyte. Increased uncertainty is associated with the reported value which is likely to be biased low.
- *C2- The Continuing Calibration did not meet method specifications and was biased high for this analyte. Increased uncertainty is associated with the reported value which is likely to be biased high.
- *F1- The Laboratory Control Sample recovery is outside of control limits. Reported value for this analyte is likely to be biased on the low side.
- *F2- The Laboratory Control Sample recovery is outside of control limits. Reported value for this analyte is likely to be biased on the high side.
- *I- Analyte exceeds method limits from second source standard in Initial Calibration Verification (ICV). No directional bias.

All results met standard operating procedures unless indicated by a data qualifier next to a sample result, or a narration in the QC report.

For Percent Solids, if any of the following prep methods (3050B, 3540C, 3545A, 3550C, 5035 and 9013A) were used for samples pertaining to this report, the percent solids procedure is within that prep method.

Complete Environmental Testing is only responsible for the certified testing and is not directly responsible for the integrity of the sample before laboratory receipt.

ND is None Detected at or above the specified reporting limit

Reporting Limit (RL) is the limit of detection for an analyte after any adjustment made for dilution or percent moisture.

All analyses were performed in house unless a Reference Laboratory is listed.

Samples will be disposed of 30 days after the report date.

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
<i>EPA 6010C in Solid</i>	
Lead	CT,NY,PA
<i>EPA 6020A in Water</i>	
Lead	CT
<i>EPA 8082A in Soil</i>	
PCB-1016	CT,NY,PA
PCB-1221	CT,NY,PA
PCB-1232	CT,NY,PA
PCB-1242	CT,NY,PA
PCB-1248	CT,NY,PA
PCB-1254	CT,NY,PA
PCB-1260	CT,NY,PA
PCB-1268	CT,NY,PA
PCB-1262	NY,PA
<i>EPA 8082A in Solid</i>	
PCB-1016	CT,NY,PA
PCB-1221	CT,NY,PA
PCB-1232	CT,NY,PA
PCB-1242	CT,NY,PA
PCB-1248	CT,NY,PA
PCB-1254	CT,NY,PA
PCB-1260	CT,NY,PA
PCB-1268	CT,NY,PA
PCB-1262	NY,PA

Complete Environmental Testing operates under the following certifications and accreditations:

Code	Description	Number	Expires
CT	Connecticut Public Health	PH0116	12/31/2020
NY	New York Certification (NELAC)	11982	04/01/2022
PA	Pennsylvania DEP	68-02927	05/31/2021

Appendix D – Asbestos Licenses

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

PURSUANT TO THE PROVISIONS OF THE GENERAL STATUTES OF CONNECTICUT

THE INDIVIDUAL NAMED BELOW IS CERTIFIED
BY THIS DEPARTMENT AS A

ASBESTOS CONSULTANT-INSP/MGMT PLANNER

ROBERT J. GRABAREK

CERTIFICATE NO.

000137

CURRENT THROUGH

10/31/21

VALIDATION NO.

03-849871

SIGNATURE

ACTING COMMISSIONER

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

PURSUANT TO THE PROVISIONS OF THE GENERAL STATUTES OF CONNECTICUT

THE INDIVIDUAL NAMED BELOW IS CERTIFIED
BY THIS DEPARTMENT AS A

ASBESTOS CONSULTANT-PROJECT DESIGNER

ROBERT J. GRABAREK

CERTIFICATE NO.

000071

CURRENT THROUGH

10/31/21

VALIDATION NO.

03-849872

SIGNATURE

ACTING COMMISSIONER

Appendix E – Sample Location Photolog



Photo 1: Photo of gunite applied to exterior of East Street Bridge (east side). Non ACM.



Photo 2: Photo of gunite remnants and footing of bridge on west side of bridge. West Side. Note person for scale.



Photo 4: Wingwall railing and caulking. Caulking and paint found to contain lead.



Photo 5: Underside of East Street bridge. Note uninsulated water main and gunite.



Photo 6: Gunite cover on East Street bridge. Note lead paint covered railing present in picture above parapet.