

**CITY OF BRISTOL  
DEPARTMENT OF PUBLIC WORKS  
BRISTOL, CONNECTICUT**



Specifications For  
**Contract 2P22-014**

**Installation of Sidewalks Shrub Road  
Bristol, Connecticut  
LOTICIP Project L017-0005**

Proposal Submitted by: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date submitted: \_\_\_\_\_

Date issued: XX xx 2025

Date Due: XXr xx 2025

**CONTRACT 2P22-014**  
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**Invitation to Bid 2P22-014  
Installation of Sidewalks Shrub Road  
LOTICIP Project L17-0005  
Bristol Connecticut**

The City of Bristol is accepting bids for the installation of sidewalk on Shrub Road. Bid documents may be obtained at no charge by downloading from the City of Bristol website via the following link:

<https://www.bristolct.gov/Bids.aspx?BidID=1293>

A non-mandatory bidder's conference to review the project requirements will be held on ????, 2024 at 11:00 am at Bristol City Hall, 111 North Main Street, Room 310, Bristol CT.

**Bids will be accepted until ????, 2025 at 2:00 pm** at the City of Bristol Purchasing Department, 111 North Main Street, 3<sup>rd</sup> Floor, Bristol CT 06010, at which time bids will be opened and read. Bids received after the opening date and time will not be considered for award. Each bid shall be in a sealed envelope addressed to the City of Bristol Purchasing Department, identified as ("Bid 2C24-093???) Shrub Road Reconstruction" accompanied by a Bid Security in the amount of 5% of the bidders base bid amount, in the form of a Bid Bond made payable to the City of Bristol.

The State of Connecticut has established that all municipal public works contracts in excess of \$50,000 financed in whole or in part by the state shall incorporate a 25% set-aside of contracting activity to small business enterprise(s); further, that 25% of said set-aside amount shall be set aside for minority business enterprise(s). Contractors are directed to the State of Connecticut Department of Administrative Services ("DAS") for information on set-aside provisions and/or registration as a set-aside business.

Prospective bidders shall examine the "Instruction to Bidders" and "Supplementary Instructions to Bidders" and shall comply and conform strictly with the conditions and instructions contained therein. The awarded contractor will be required to secure a Performance Bond and a Labor and Materials Bond, each in the amount of 100% of the contract award, provided by a surety licensed to do business in the State of Connecticut. The requirements for prevailing wage rates as outlined within G.G.S. 31-53 are to apply to the resultant contract award.

The City reserves the right to waive any informalities in the bid, to reject any or all bids, and to accept the bid that in its judgment is in its best interest. Bids must be firm and may not be withdrawn for a period of 90 days following the bid opening.

The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, gender, or national origin.

Roger D. Rousseau  
Purchasing Agent  
Tel (860) 584-6195  
<http://www.bristolct.gov/bids>

INSTRUCTIONS TO BIDDERS  
CITY OF BRISTOL, CONNECTICUT 06010

**Contract 2P22-014**  
**Installation of Sidewalks on Shrub Road**  
**LOTICIP Project L017-0005**

The following instructions and specifications shall be observed by all Bidders:

1. **TIME AND PLACE OF BID OPENING**

Bids will be received by and opened at **2:00 pm on ???? ??, 2025** at  
the City of Bristol CT  
Purchasing Department  
111 North Main Street, 3<sup>rd</sup> Floor  
Bristol, CT 06010

Any bid received after the date and time of the bid opening shall not be considered.

2. **PRE-BID MEETING**

A non-mandatory bidder's conference to review the project requirements will be held on **???? ??, 2025 at 11:00 am** at Bristol City Hall, 111 North Main Street, Room 310, Bristol CT.

3. **AVAILABILITY OF BID DOCUMENTS**

The prospective bidder must register its name and address when securing the plans and specifications. Plans and Specifications may be secured online at the web address noted below. Bidders are advised that all bid documents relative to this project are available online at the following web address:

<https://www.bristolct.gov/Bids.aspx?BidID=1293>

4. **FEE FOR BID DOCUMENTS**

Plans and specifications are available at no charge from the City of Bristol web site.

5. **BID ADDENDA**

If additional information or change shall present itself, the Purchasing Department will send such change in a written addendum not later than three days prior to the date fixed for the opening of bids to the address given by the Contractor at the time of securing the Proposal document. Failure of any bidder to receive any such addendum shall not relieve it of the obligations under its bid as submitted. All addenda so issued shall become a part of the Contract Documents. Certification of receipt of addenda shall be made by the bidder on the Proposal.

Notice of any addendum issued shall be provided by first class mail and/or by email notification; notice of said addendum are additionally posted upon release at the website hosting the plans and specifications. There is no additional download fee for retrieval of addenda.

Bidders are requested to acknowledge receipt of any addendum to ensure proper notification of changes to the published specifications. The City does not assume responsibility for any bidder that does not receive any addendum.

6. **BID BOND REQUIREMENTS**

A Bid Bond in the amount of five percent (5 %) of the total amount bid, issued by a surety licensed to do business in the State of Connecticut, is required. Bid Security will be returned to all except the successful bidder upon award, and to the successful bidder upon issuance of a Purchase Order. NO BID WILL BE ACCEPTED UNLESS ACCOMPANIED BY THE REQUIRED BID BOND.

7. **BID INSTRUCTIONS**

- (a) Bids must be provided directly to the Purchasing Department.
- (b) Bids must be made on the attached forms with complete information as requested on the bid forms; bids submitted on other than the forms included within this document will not be considered.

8. **EXAMINATION OF SITE CONDITIONS**

Bidders must satisfy themselves by personal examination of the locations and site of the proposed work as to the actual conditions and requirements of the work and inform themselves fully of the conditions relating to the construction and labor under which the work will be performed. No claim because of the lack of knowledge by the Contractor regarding the site, the proposed work, or content of the specifications and drawings will be allowed. At the date fixed for opening of Bids, it will be presumed that each Bidder has made an examination of the locations and site of work to be done under this Contract and has satisfied himself to the actual conditions and requirements.

9. **PREVAILING WAGE RATES**

This project shall be subject to prevailing wage rates. Enclosed within these specifications are prevailing wage rates as issued by the State of Connecticut Department of Labor. The successful bidder shall include any additional costs associated with prevailing wage rates as part of its bid.

10. **SALES AND USE TAX**

Bidders are reminded that the Connecticut State Sales and Use Tax, and associated Federal taxes are not applicable under this contract, and therefore these taxes are not to be included in the bid price(s).

Under terms of Regulation 16, referring to Contractors and Subcontractors, issued by the State Tax Commission in administration of the State Sales and Use Tax, the Contractor may purchase materials and supplies to be consumed in the performance of the Contract without payment of the tax and shall not include in his bid nor charge any sales or use tax thereon.

11. **DEFINITIONS**

The word "City" as used throughout these documents shall refer to the City of Bristol, Connecticut acting through its Mayor and City Council.

The phrase "Mayor" as used throughout these documents shall mean the Mayor of the City of Bristol.

The word "Director" as used throughout these documents refers to the Director of Public Works of the City of Bristol.

The word "Engineer" as used throughout these documents refers to the City Engineer of the City of Bristol.

The word "Bidder" as used throughout these documents refers to the party or parties submitting a bid to perform the work to be done or materials to be furnished under the Contract; the legal representatives of such party or parties.

The word "Contractor" as used throughout these documents refers to the party or parties contracting to perform the work to be done or materials to be furnished under the Contract; the legal representatives of such party or parties.

12. **SUBCONTRACTORS**

Notwithstanding the provisions for CHRO Small Business Enterprise (SBE) requirements as outlined in Article 19 of this section, the contractor shall not sublet any portion of the work without written permission. In no case may it sublet more than 49% of the monetary value of the Contract (i.e., the major units of work of the Contract shall be performed by the Contractor). If the Contractor sublets any part of the work, this does not relieve it or the bonding company of liabilities and obligations to the City. There is no contractual relationship between any subcontractor and the City; the Engineer deals only with the Contractor. For the purposes of this section, costs attributable directly to equipment purchase costs shall neither be attributable to general contractor nor subcontractor.

The Contractor must not assign or dispose of his Contract in any way without the written consent of the Engineer in conjunction with that of the Mayor. Disposal must be for a cause only.

13. **PROJECT LOCATION**

The work for this project will be performed at Wolcott Street, Bristol, Connecticut.

14. **INTENT**

The Intent of these specifications is to obtain a Contractor that will furnish all labor, supervision, tools, materials, and equipment necessary to perform full reconstruction of Wolcott Street, as shown within the attached drawings and specifications.

15. **WORK SCHEDULE**

The Contractor shall contact the Public Works Department prior to the start of any work associated with this Contract.

No work will be performed at night or on Sundays or legal holidays except in case of emergency and only to the extent necessary to make the work safe. The normal work day shall be considered as any eight (8) hour period falling between 7:00 am and 5:00 pm, Monday through Friday. Special clearance will be required for work outside these times.

16. **EVALUATION OF PRICES SUBMITTED**

Bids will be compared on the basis of the estimated quantities times unit or lump sum prices stated in the Proposal. In the event of a discrepancy between prices written in words and figures; the prices written in words shall govern. It is the intent of the City of Bristol to make award to the lowest responsible qualified bidder (reference C.G.S. 4a-59). In the event of a discrepancy between (1) the Total Amount of the bids as recorded on the bid form by the bidder and (2) the Total Amount of lump sum line items and/or unit prices as recorded on the bid form by the bidder extended by designated quantities and tabulated by the Purchasing Agent, the latter shall prevail.

17. **ENGINEER ESTIMATE OF WORK**

In the event that quantities of materials and/or services are provided and unit prices are requested, the estimate of work and material by which the bids will be compared, are as shown in the Proposal and are solely for the purpose of comparing proposals received and are approximate only and are not guaranteed. In such circumstance, the parts of the work have been divided into items in order to allow the bidder to bid for the different portions of the work in accordance with his estimate of their cost; so that in event of an increase or decrease of the quantities of any item of work, the actual quantity executed may be paid for at the price bid for that particular item of work.

18. **CONTRACTOR QUALIFICATIONS**

Bidders, if requested, must be able to present satisfactory evidence that they are capable and fully prepared with necessary capital, personnel, materials, and equipment to do the work to be contracted for under this Proposal.

Bidders must be registered with the State of Connecticut Department of Transportation as fully qualified to perform construction for a Class 8 or greater bridge structure and shall provide evidence of such registration as part of its bid submission, via a separate attachment.

Please note that in the event that the City of Bristol requests financial information (e.g., financial statements), such materials may remain confidential, if provided in a separate envelope clearly marked "Confidential."

19. **CERTIFICATE OF GOOD STANDING**

Any corporation whose Proposal is being considered for acceptance by the City may be required, if requested, to provide a "Certificate of Good Standing" from the Secretary of the State's Office for Connecticut.

20. **ACCEPTANCE/REJECTION OF BIDS**

The City of Bristol may reject bids which are incomplete, conditional, obscure, contain additions not called for, erasures not properly initialed, or which contain alterations or irregularities of any kind. The City may rightfully waive informalities. The Purchasing Agent reserves the right to reject any or all bids; or the bids for any one or more commodities; or contractual services included in any or all bids; and/or to waive any informality in bids; and unless otherwise specified, to buy any part or the whole from one or more bidders when it is to the City's best interest to do so. The City also reserves the right to reject any or all bids, or to accept any bid whether the lowest or not, should the City deem it for their best interest to do so.

Determination of the best interests of the City shall include consideration of active or pending civil litigation between the City and any firm (or its subcontractor or supplier) submitting a bid to the City.

Bidders are advised that the City of Bristol has established and maintains information relative to vendor debarment. Guidelines and regulations relative to debarment may be viewed online via the following web link:

<http://www.bristolct.gov/DocumentCenter/View/11910>

21. **Commission on Human Rights Opportunities**

The Contractor who is selected to perform this State project must comply with Connecticut General Statute Secs. 4a-60, 4a-60a, 4a-60g., and 46a-68b through 46a-68f, inclusive, as amended by June 2015 Special Session Public Act 15-5. An Affirmative Action Plan must be filed with and approved by the Commission on Human Rights and Opportunities prior to the commencement of construction.

State law requires a minimum of twenty-five (25%) percent of the contract to be set aside for award to subcontractors holding current certifications from the Connecticut Department of Administrative Services (DAS) under the provisions of Connecticut General Statute Sec. 4a-60g, as amended. (25% of the work with DAS certified Small and Minority owned businesses and 25% of that work with DAS certified Minority, Women and/or Disabled owned businesses.) The Contractor must demonstrate good faith effort to meet the twenty-five (25%) percent set-aside goals.

For municipal public works contracts and quasi-public agency projects, the Contractor must file a written or electronic non-discrimination certification with the Commission on Human

Rights and Opportunities (CHRO). Forms can be found at:

[http://www.ct.gov/opm/cwp/view.asp?a+2982&q=390928&opmNav\\_GID=1806](http://www.ct.gov/opm/cwp/view.asp?a+2982&q=390928&opmNav_GID=1806)

22. **WITHDRAWAL OF BID SUBMITTED**

Any bid may be withdrawn prior to the designated closing time for receiving bids. Bids may be withdrawn 90 days after the bid opening if no award has been made. If the City does not award a contract within ninety (90) days after the opening of bids, all bid proposals will be null and void except on mutual agreement of the City and the lowest qualified bidder, this time may be extended.

23. **FAILURE TO SUBMIT BID**

Failure to return a bid may result in the company's name being removed from the Bid List. "No Bids" and responsive bids will result in Bid List retention.

24. **CONTRACT EXECUTION**

The person or persons whose Proposal is accepted will be required to furnish all insurance certificates in amounts as hereinafter specified, within five (5) days from the date of notice of the award; said person or persons will also be required to furnish all performance and payment bonds within three (3) days from request by the City, and at least three (3) days prior to the signing of the Contract.

The person or persons whose Proposal is accepted will be required to execute a contract, in substantially the form annexed, as scheduled by the Office of the Mayor. Once the contract is executed via formal contract signing at Bristol City Hall, the Contractor will be issued a City Purchase Order for the contract.

Contracts valued at less than \$50,000.00 may be executed directly via the issuance of a purchase order, at the discretion of the City.

25. **INCLUSION OF CONTRACT PROVISIONS**

The bidders' attention is directed to the form of this agreement, which includes as a part of it in addition to the Instructions to Bidders, Bid Proposal, General Provisions, Special Provisions, Specifications, Measurement and Payment, Contract Drawings and Standard Detail Drawings.

26. **PROVISION OF CONTRACT RELATED DOCUMENTS**

Bonds and Insurance Certificates shall be submitted to the Purchasing Agent. In case of failure or refusal on the part of the bidder to enter into a contract or to furnish the required bonds and/or required insurance certificates, within the set time periods, the bidder shall forfeit to the City of Bristol such part of the bid bond as shall be equal to the difference between the total bid of the defaulting bidder, and the total bid of the person or persons with whom the contract is finally executed.

27. **ACCEPTANCE OF ALTERNATE MATERIALS OR METHODS**

When alternate bids are asked for, the City at time of the awarding or prior to signing of the Contract, through its Engineer, will select which type of material or construction will be used.

28. **INDEMNIFICATION**

The Contractor, in contracting for goods, services, materials, labor and the like with the City of Bristol and its respective officers, agents and servants, does hereby agree that the Contractor will indemnify and save harmless the City of Bristol, its respective officers, agents and servants from and against any and all claims, damages, losses, litigation expenses, counsel fees and compensation arising out of any injuries (including death) sustained by, or alleged to have been sustained by, the servants, employees or agents of the City of Bristol, or of the Contractor or of any participant or spectator, and from injuries (including death) sustained by, or alleged to have been sustained by, the public or any persons on or near the site, or on any other person or damage to property, real or personal, including property of the City of Bristol and their respective officers, agents and servants, caused in whole or in part by the acts or omission of the Contractor or any participant or spectator or anyone directly or indirectly employed or working for the bidder while engaged in the activity in the City of Bristol.

29. **EQUAL OPPORTUNITY - AFFIRMATIVE ACTION**

The successful contractor shall comply in all aspects with the Equal Employment Opportunity Act as well as the provisions of Title VI of the Civil Rights Act of 1964 and all amendments thereto. Each Contractor with 15 or more employees shall be required to have an Affirmative Action Plan which declares that the contractor does not discriminate on the basis of race, color, religion, gender, national origin or age and which specifies goals and target dates to assure the implementation of equal employment. Each contractor with fewer than 15 employees shall be required to have a written equal opportunity policy statement declaring that it does not discriminate on the basis of race, color, religion, gender, national origin, or age. Findings of noncompliance with applicable State and Federal equal opportunity laws and regulations could be sufficient reason for revocation or cancellation of this contract. The contract is subject to contract compliance requirements mandated by Sections 4a-60 and 4a-60a of the State of Connecticut General Statutes.

Included within these specifications is an Employment Information Form. Firms with 15 or more employees are required to complete the form and return as part of their bid submission.

30. **CONTRACTOR'S AND SUBCONTRACTOR'S INSURANCE**

The awarded Contractor shall provide a certificate of insurance naming the City of Bristol and the State of Connecticut as an "additional insured" in the minimum amounts as specified herein. Said insurance shall be provided at the sole expense of the Contractor with an insurance company which is licensed to do business in the State of Connecticut.

- a. **General liability** - \$1,000,000 (combined single limit) bodily injury/property damage coverage per occurrence and \$2,000,000 aggregate coverage.

- b. **Auto liability** - \$1,000,000 (combined single limit). Property damage and bodily injury coverage.

In addition to the above, the awarded contractor shall provide a certificate of insurance in the minimum amounts as specified herein. Said insurance shall be provided at the sole expense of the Contractor with an insurance company which is licensed to do business in the State of Connecticut.

- c. **Owners & Contractors Protective Insurance** policy to be provided in the name of the City of Bristol, with no deductible payable by the City, with the same limits as required for General Liability Insurance. A copy of the declaration page must be included with the certificate of insurance.
- d. **Worker's Compensation** as required by Connecticut Law.

The City of Bristol reserves the right to modify and/or change the insurance requirements. All individual modifications to the insurance limits require prior approval of the Comptroller's Office of the City of Bristol.

Certificates of coverage on motorized equipment, cars, and trucks, including non-ownership and hired vehicles shall also be filed.

Any subcontractor shall be likewise covered and shall furnish certificates of coverage acceptable to the City before starting work. It is the responsibility of the contractor to inform the city of any and all subcontractors relevant to this project, and to provide the City certificates of Coverage for such subcontractors, inclusive of workers compensation coverage. No work on the project can be performed in the absence of current certificates of coverage.

All certificates of coverage shall be filed in triplicate. All policies and/or certificates shall have a ten (10) day written notice to the City of Bristol of expiration or cancellation.

31. **BOND REQUIREMENTS**

The awarded contractor shall provide the following bonds in the minimum amounts as specified herein.

- a. **Labor and Materials Bond** in the amount of 100% of the Total Proposal Price guaranteeing to the City payments for all labor, materials, and equipment utilized in the completion of work under the Contract in the amount of contract award.
- b. **Performance Bond**, guaranteed by Surety licensed to do business in Connecticut, in the amount of 100% of the Total Proposal Price guaranteeing to the City the completion of the Contract.
- c. **DRS Guarantee Bond** (for out-of-state contractors only); A non-resident contractor working in Connecticut and a surety company licensed to do business in Connecticut shall use Form AU-766 enclosed to post a guaranteed bond with the Department of Revenue Services (DRS) for a specific project in the state.

All bonds shall be guaranteed by Surety licensed to do business in Connecticut.

It is distinctly agreed and understood that any changes in plans and/or specifications for this work, whether such changes increase or decrease the amount thereof, or the manner or time of payment, shall in no way annul, release or affect the liability and surety on the bond given by the Contractor.

32. **PERMITS**

The Contractor shall, at its own expense, take out and possess all necessary permits required and licenses required by law and necessary for the prosecution of the work under this Contract; including the posting of all bonds and payment of all fees and charges incidental to the due and lawful prosecution of the work covered by the Contract. The City of Bristol does not waive permit fees for work performed under this contract.

33. **SAFETY**

All work done and equipment used shall comply with all pertinent O.S.H.A., Federal, State, Municipal, and Local regulations, laws, ordinances, and Regulations affecting those employed and any affecting the conduct of the work.

Not later than thirty (30) days after the date a contract is awarded, the awarded contractor shall furnish proof to the Labor Commissioner that all employees performing manual labor on or in such public project, pursuant to such contract, have completed a course of at least ten (10) hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration, or in the case of telecommunications employees, have completed at least ten (10) hours of training in accordance with 29 CFR 1910.268.

34. **PERSONNEL REQUIREMENTS**

All work under the contract shall be performed by competent and proficient tradesman employed by the Contractor and under his supervision. Helpers and Apprentices may be used, but only under direct supervision of the job Foreman.

35. **PREVAILING WAGE RATES**

If designated as subject to prevailing wage rates in Item 9 of this section, the contractor shall pay its workers in accordance with the wage rates included with this specification.

**Contract 2P22-014**

**BID PROPOSAL**

CITY OF BRISTOL, CONNECTICUT 06010

**Contract 2P22-014  
Installation of Sidewalks Shrub Road**

City of Bristol, Connecticut  
Purchasing Department  
111 North Main Street  
Bristol, CT 06010

TO THE CITY OF BRISTOL:

The person signing herein hereby declares that no Person or persons other than members of his own organization are interested in this Proposal or in the contract proposed to be taken; that it is made without any connection with any other person or persons making a proposal for the same work and is in all respects fair and without collusion or fraud; that no person acting for or employed by the City of Bristol is directly or indirectly interested therein, or in the supplies or works to which it relates or will receive any part of the profit or any commission therefrom in any manner which is unethical or contrary to the best interests of the City of Bristol. It is understood that the City, its agents and employees, are not to be, in any manner, held responsible for the accuracy of, or bound by any estimates relative to the work; all such estimates are to be considered solely for the purpose of filling out and comparing the several proposals.

The person signing herein further declares that he has examined the site of the work, the general information, the plans and specifications and the form of contract, and will contract to provide all necessary tools, apparatus, freight, cartage and expense, and to do all the work and furnish all materials necessary to construct the proposed work in the manner and upon the conditions specified and the terms which follow herein.

The person signing herein also agrees to furnish satisfactory performance and payment bonds with surety and to execute and deliver within 15 days after the notice of award, a formal contract with the City of Bristol for the fulfillment of this Proposal; and it is agreed, in case of failure or neglect on the part of the undersigned to do so, the City may determine the contract abandoned and declare the Proposal and acceptance null and void. The City may, at its option, declare the bid bond forfeited. No bid may be withdrawn for a period of 90 days after the opening of the bids.

The entity submitting this bid proposal agrees to construct complete in place, including all labor, materials and equipment, "Contract 2C24-093 Wolcott Street Reconstruction" according to the attached specifications and plans for the unit prices and/or lump sum prices hereinafter listed, times the actual quantities of the completed work as computed by the Engineer.

**Contract 2P22-014**

The undersigned declares that the bidder is:

(a) A CORPORATION organized under the laws of the State of \_\_\_\_\_ having its principal office at \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

The principal officers, with their respective titles and addresses, are as follows:

Name	Title	Address
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

(b) A PARTNERSHIP consisting of the following individuals with their addresses:

Name	Address
_____	_____
_____	_____
_____	_____
_____	_____

(c) AN INDIVIDUAL by the name of \_\_\_\_\_  
and doing business as \_\_\_\_\_

**Contract 2P22-014**

**BID PROPOSAL**

In accordance with the attached specifications entitled "**Contract 2P22-014 Installation of Sidewalks, Shrub Road**", the undersigned agrees to perform all work in accordance with the specifications set forth herein, at the costs indicated below. In case of a discrepancy between the final Extension (cost) listed and the Unit Price times the Quantity listed, then the Unit Price times the Quantity shall govern the final Extension (cost) for any particular item.

<b>STRUCTURAL ITEMS</b>					
<b>Item</b>	<b>Description</b>	<b>Units</b>	<b>Qty.</b>	<b>Unit Price</b>	<b>Extension</b>
0203202	STRUCTURE EXCAVATION-EARTH (EXCLUDING COFFERDAM AND DEWATERING)	C.Y.	73		
0204001	COFFERDAM AND DEWATERING	L.F.	79		
0214100	COMPACTED GRANULAR FILL	C.Y.	12		
02016000	PERVIOUS STRUCTURE FILL	C.Y.	46		
04014441	1/2" PREFORMED STRUCTURE BACKFILL	S.F.	11		
0520041A	PREFORMED JOINT SEAL	LF	10		
0601062	FOOTING CONCRETE	C.Y.	21		
0601064	ABUTMENT AND WALL CONCRETE	C.Y.	13		
0602030	DEFORMED STEEL BARS – GALVANIZED	LB	2,595		
0603324A	PEDESTETRIAN BRIDGE	L.S	1		
0708001	DAMPROOFING	S.Y.	5		
0819002A	PENETRATING SEALER PROTECTIVE COMPOUND	S.Y.	52		

**Contract 2P22-014**

<b>HIGHWAYS ITEMS</b>					
<b>Item</b>	<b>Description</b>	<b>Units</b>	<b>Qty.</b>	<b>Unit Price</b>	<b>Extension</b>
0201001	CLEARING AND GRUBBING	L.S.	1		
0201012A	REMOVAL OF TREES	EA.	31		
0201198A	REMOVE AND RELOCATE STONES	LS.	1		
0201501A	RELOCATION OF MAILBOX	EA.	12		
0202000	EARTH EXCAVATION	C.Y.	1,400		
0202100	ROCK EXCAVATION	C.Y.	770		
0202512A	CUT CONCRETE SIDEWALK	L.F.	13		
0202513	REMOVAL OF CONCRETE SIDEWALKS	S.Y.	36		
0202529	CUT BITUMINOUS CONCRETE PAVEMENT	L.F.	5,405		
0205004	ROCK IN TRENCH EXCAVATION 0'-10' DEEP	C.Y.	5		
0207000	BORROW	C.Y.	775		
0209001	FORMATION OF SUBGRADE	S.Y.	540		
0213100	GRANULAR FILL	C.Y.	13		
0219001	SEDIMENTATION CONTROL SYSTEM	L.F.	3,900		
0219011A	SEDIMENTATION CONTROL SYSTEM AT CATCH BASIN	EA.	11		
0304002	PROCESSED AGGREGATE BASE	C.Y.	125		
0406170	HMA S1.0	TON	333		
0406172	HMA S0.375	TON	95		
0406194A	JOINT AND CRACK SEALING OF BITUMINOUS CONCRETE PAVEMENT	L.F.	5,404		
0406236	MATERIAL FOR TACK COAT	GAL.	68		
0409001	FINE-MILLING OF BITUMINOUS CONCRETE (0 IN TO 4 IN)	S.Y.	525		

**Contract 2P22-014**

<b>HIGHWAY ITEMS CONTINUED</b>					
<b>Item</b>	<b>Description</b>	<b>Units</b>	<b>Qty.</b>	<b>Unit Price</b>	<b>Extension</b>
0586001.10	TYPE 'C' CATCH BASIN - 0' - 10' DEEP	EA.	4		
0586003.10	TYPE 'C' CATCH BASIN DOUBLE GRATE TYPE 1 - 0' - 10' DEEP	EA.	4		
0586042.10	TYPE 'C-L' CATCH BASIN DOUBLE GRATE TYPE 1 - 0' - 10' DEEP	EA.	1		
0586703	CONVERT CATCH BASIN TO MANHOLE	EA.	4		
0601651A	RETAINING WALL (SITE NO. 1)	L.S.	1		
0601652A	RETAINING WALL (SITE NO.2)	L.S.	1		
0601653A	RETAINING WALL (SITE NO.3)	L.S.	1		
0601654A	RETAINING WALL (SITE NO.4)	L.S.	1		
0653001	CLEAN EXISTIN CATCH BASIN	EA.	29		
0686230.15	15" HIGH DENSITY POLYETHELENE PIPE 0' - 10' DEEP	L.F.	55		
0703011	INTERMEDIATE RIRPRAP	C.Y.	16		
0755014	GEOTEXTILE (SEPARATION-HIGH SURVIVABILITY	S.Y.	38		
0815001	BITUMINOUS CONCRETE LIP CURBING	L.F.	5,275		
0910034	THRIE BEAM 350 BRIDGE ATTACHMENT	EA.	1		
0910300	METAL BEAM RAIL (R-B MASH)	L.F.	165		
0911912	ANCHOR IN EARTH CUT SLOPE	EA.	1		
0912503	REMOVE METAL BEAM RAIL	L.F.	115		
0913992A	DECORATIVE FENCE	L.F.	50		
	<b>HIGHWAY ITEMS CONTINUED</b>				

**Contract 2P22-014**

<b>Item</b>	<b>Description</b>	<b>Units</b>	<b>Qty.</b>	<b>Unit Price</b>	<b>Extension</b>
0921001	CONCRETE SIDEWALK	S.F.	26,600		
0921005	CONCRETE SIDEWALK RAMP	S.F.	2,015		
0921048	DETECTABLE WARNING SURFACE	S.F.	280		
0922501	BITUMINOUS CONCRETE DRIVEWAY	S.Y.	510		
0944000	FURNISHING AND PLACING TOPSOIL	S.Y.	5,915		
0949145	QUERCUS RUBRA, NORTHERN RED OAK, 1 ¾ IN-2 IN CAL.B.B.	EA.	31		
0950019A	TURF ESTABLISHMENT - LAWN	S.Y.	5,915		
0950033	EROSION CONTROL MATTING TYPE H	S.Y.	50		
0950039	EROSION CONTROL MATTING TYPE D	S.Y.	2,805		
0969060A	CONSTRUCTION FIELD OFFICE, SMALL	MO.	13		
0971001A	MAINTENANCE AND PROTECTION OF TRAFFIC	L.S.	1		
0974005A	REMOVAL OF EXISTING RETAINING WALL	L.S.	1		
0975002	MOBILIZATION AND PROJECT CLOSEOUT	L.S.	1		
0978002	TRAFFIC DRUM	EA.	15		
0980001	CONSTRUCTION SURVEYING	L.S.	1		
0981100	42" TRAFFIC CONE	EA.	25		
1206036A	REMOVE AND RELOCATE SIGN	EA.	13		
1204122A	PROJECT SIGN	L.S.	1		
1206023A	REMOVAL AND RELOCATION OF EXISTING SIGNS	L.S.	1		
	<b>HIGHWAY ITEMS CONTINUED</b>				

**Contract 2P22-014**

Item	Description	Units	Qty.	Unit Price	Extension
1208937A	SIGN FACE - SHEET ALUMINUM (TYPE XI RETROREFLECTIVE SHEETING)	SF	26		
1210101	4" WHITE EPOXY RESIN PAVEMENT MARKINGS	L.F.	9,945		
1210102	4" YELLOW EPOXY RESIN PAVEMENT MARKINGS	L.F.	8,200		
1210105	EXPOXY RESIN PAVEMENT MARKINGS, SYMBOLS AND LEGENDS	S.F.	1,365		
1210108	6" YELLOW EPOXY RESIN PAVEMENT MARKINGS	L.F.	1,365		

The **TOTAL AMOUNT** of the Base Bid, as computed by the Bidder is:

\_\_\_\_\_

\_\_\_\_\_ DOLLARS and

\_\_\_\_\_ CENTS. \$ \_\_\_\_\_

**Contract 2P22-014**

The undersigned is familiar with the conditions surrounding this call for bid and is aware that the City reserves the right to reject any and all bids or to accept any bids whether lowest or not if deemed for the best interest of the City, and is submitting this bid without collusion with any other person, individual or corporate.

\_\_\_\_\_  
Witness

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
Date

\_\_\_\_\_  
Title

\_\_\_\_\_  
Company/Name of Firm

\_\_\_\_\_  
Company Telephone Number

\_\_\_\_\_  
Contact email address

\_\_\_\_\_  
Business Address

\_\_\_\_\_  
Mailing Address

\_\_\_\_\_  
City/Town      State      Zip

\_\_\_\_\_  
City/Town      State      Zip

**ADDENDA RECEIVED**

Number	Date
_____	_____
_____	_____
_____	_____

**Contract 2P22-014**

**LICENSES**

COMPANY NAME/ADDRESS/PHONE NUMBER      REPRESENTATIVE

1.	_____	_____
	_____	
2.	_____	_____
	_____	
3.	_____	_____
	_____	
4.	_____	_____
	_____	

**REFERENCES FOR SIMILAR WORK**

COMPANY NAME/ADDRESS/PHONE NUMBER      REPRESENTATIVE

1.	_____	_____
	_____	
2.	_____	_____
	_____	
3.	_____	_____
	_____	

**Contract 2P22-014**

**PROPOSED SUBCONTRACTORS**

COMPANY/INDIVIDUAL NAME/ADDRESS/PHONE

LICENSE NUMBER

1. \_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_

3. \_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_

4. \_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_

5. \_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_



**CONTRACTOR SITE VERIFICATION FORM**

**Contract 2P22-014  
Installation of SIDEWALKS, Shrub Road  
Bristol, CT**

AN INDIVIDUAL by the name of \_\_\_\_\_

and representing \_\_\_\_\_  
(Company Name)

hereby attest that I have field walked the site for the above referenced project and am familiar with the existing conditions.

\_\_\_\_\_  
Date

By: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

**Invitation to Bid 2P22-014  
Installation of Sidewalks Shrub Road  
Bristol, Connecticut  
LOT/CIP Project L017-0005**

Bidders must be registered with the State of Connecticut Department of Transportation as fully qualified to perform construction for a Class 8 or greater bridge structure and shall provide evidence of such registration as part of its bid submission, via a separate attachment.



## City of Bristol, Connecticut Non-Collusion Certification

The undersigned certifies under penalty of false statement that this proposal or contract has been made, submitted and executed in good faith and without collusion or fraud with any other person, and without any agreement designed to limit independent bidding or competition. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club or other organization, entity or group of individuals.

I further certify that I have not provided or directed to be provided gifts, meals, or gratuities, as defined in Sec. 2-129(b) of the Bristol Code of Ordinances to any official or employee of the City of Bristol responsible for awarding or administering this bid or contract.

### Please complete and sign

Legal Name of Bidder: \_\_\_\_\_

Business Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Name of Authorized Agent \_\_\_\_\_ Title: \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_



**City of Bristol, Connecticut  
NON-USE OF FRACKING WASTE MATERIALS**

We hereby certify under penalty of perjury that no natural gas waste or oil waste will be used by the undersigned bidder or any contractor, sub-contractor, agent or vendor agent in connection with the bid; nor will the undersigned bidder or any sub-contractor, agent or vendor agent thereof apply any natural gas waste or oil waste to any road or real property within the City of Bristol as a result of the submittal of this bid if selected.

For the purposes of this certification, the terms 'oil waste' and 'natural gas waste' do not include products derived from the distillation or refinement of petroleum such as asphalt or bitumen.

\_\_\_\_\_  
(Company Name)

\_\_\_\_\_  
Date

By: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

**COMMISSION ON HUMAN RIGHTS AND OPPORTUNITIES**  
**CONTRACT COMPLIANCE REGULATIONS**  
**NOTIFICATION TO BIDDERS**

(Revised 09/3/15)

The contract to be awarded is subject to contract compliance requirements mandated by Sections 4a-60 and 4a-60a of the Connecticut General Statutes; and, when the awarding agency is the State, Sections 46a-71(d) and 46a-81i(d) of the Connecticut General Statutes. There are Contract Compliance Regulations codified at Section 46a-68j-21 through 43 of the Regulations of Connecticut State Agencies, which establish a procedure for awarding all contracts covered by Sections 4a-60 and 46a-71(d) of the Connecticut General Statutes.

According to Section 46a-68j-30(9) of the Contract Compliance Regulations, every agency awarding a contract subject to the contract compliance requirements has an obligation to “aggressively solicit the participation of legitimate minority business enterprises as bidders, contractors, subcontractors and suppliers of materials.” “Minority business enterprise” is defined in Section 4a-60 of the Connecticut General Statutes as a business wherein fifty-one percent or more of the capital stock, or assets belong to a person or persons: “(1) Who are active in 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 Section 32-9n.” “Minority” groups are defined in Section 32-9n of the Connecticut General Statutes as “(1) Black Americans . . . (2) Hispanic Americans . . . (3) persons who have origins in the Iberian Peninsula . . . (4) Women . . . (5) Asian Pacific Americans and Pacific Islanders; (6) American Indians . . .” An individual with a disability is also a minority business enterprise as provided by Section 4a-60g of the Connecticut General Statutes. The above definitions apply to the contract compliance requirements by virtue of Section 46a-68j-21(11) of the Contract Compliance Regulations.

The awarding agency will consider the following factors when reviewing the bidder’s qualifications under the contract compliance requirements:

- (a) the bidder’s success in implementing an affirmative action plan;
- (b) the bidder’s success in developing an apprenticeship program complying with Sections 46a-68-1 to 46a-68-17 of the Administrative Regulations of Connecticut State Agencies, inclusive;
- (c) the bidder’s promise to develop and implement a successful affirmative action plan;
- (d) the bidder’s submission of employment statistics contained in the “Employment Information Form”, indicating that the composition of its workforce is at or near parity when compared to the racial and sexual composition of the workforce in the relevant labor market area; and
- (e) the bidder’s promise to set aside a portion of the contract for legitimate minority business enterprises. See Section 46a-68j-30(10)(E) of the Contract Compliance Regulations.

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**INSTRUCTIONS AND OTHER INFORMATION**

The following BIDDER CONTRACT COMPLIANCE MONITORING REPORT must be completed in full, signed, and submitted with the bid for this contract. The contract awarding agency and the Commission on Human Rights and Opportunities will use the information contained thereon to determine the bidders compliance to Sections 4a-60 and 4a-60a CONN. GEN. STAT., and Sections 46a-68j-23 of the Regulations of Connecticut State Agencies regarding equal employment opportunity, and the bidder’s good faith efforts to include minority business enterprises as subcontractors and suppliers for the work of the contract.

1) **Definition of Small Contractor**

Section 4a-60g CONN. GEN. STAT. defines a small contractor as a company that has been doing business under the same management and control and has maintained its principal place of business in Connecticut for a one year period immediately prior to its application for certification under this section, had gross revenues not exceeding fifteen million dollars in the most recently completed fiscal year, and at least fifty-one percent of the ownership of which is held by a person or persons who are active in the daily affairs of the company, and have the power to direct the management and policies of the company, except that a nonprofit corporation shall be construed to be a small contractor if such nonprofit corporation meets the requirements of subparagraphs (A) and (B) of subdivision 4a-60g CONN. GEN. STAT.

**MANAGEMENT:** Managers plan, organize, direct, and control the major functions of an organization through subordinates who are at the managerial or supervisory level. They make policy decisions and set objectives for the company or departments. They are not usually directly involved in production or providing services. Examples include top executives, public relations managers, managers of operations specialties (such as financial, human resources, or purchasing managers), and construction and engineering managers.

**BUSINESS AND FINANCIAL OPERATIONS:** These occupations include managers and professionals who work with the financial aspects of the business. These occupations include accountants and auditors, purchasing agents, management analysts, labor relations specialists, and budget, credit, and financial analysts.

**MARKETING AND SALES:** Occupations related to the act or process of buying and selling products and/or services such as sales engineer, retail sales workers and sales representatives including wholesale.

**LEGAL OCCUPATIONS:** In-House Counsel who is charged with providing legal advice and services in regards to legal issues that may arise during the course of standard business practices. This category also includes assistive legal occupations such as paralegals, legal assistants.

**COMPUTER SPECIALISTS:** Professionals responsible for the computer operations within a company are grouped in this category. Examples of job titles in this category include computer programmers, software engineers, database administrators, computer scientists, systems analysts, and computer support specialists

**ARCHITECTURE AND ENGINEERING:** Occupations related to architecture, surveying, engineering, and drafting are included in this category. Some of the job titles in this category include electrical and electronic engineers, surveyors, architects, drafters, mechanical engineers, materials engineers, mapping technicians, and civil engineers.

**OFFICE AND ADMINISTRATIVE SUPPORT:** All clerical-type work is included in this category. These jobs involve the preparing, transcribing, and preserving of written communications and records; collecting accounts; gathering and distributing information; operating office machines and electronic data processing equipment; and distributing mail. Job titles listed in this category include telephone operators, bill and account collectors, customer service representatives, dispatchers, secretaries and administrative assistants, computer operators and clerks (such as payroll, shipping, stock, mail and file).

**BUILDING AND GROUNDS CLEANING AND MAINTENANCE:** This category includes occupations involving landscaping, housekeeping, and janitorial services. Job titles found in this category include supervisors of landscaping or housekeeping, janitors, maids, grounds maintenance workers, and pest control workers.

**CONSTRUCTION AND EXTRACTION:** This category includes construction trades and related occupations. Job titles found in this category include boilermakers, masons (all types), carpenters, construction laborers, electricians, plumbers (and related trades), roofers, sheet metal workers, elevator installers, hazardous materials removal workers, paperhangers, and painters. Paving, surfacing, and tamping equipment operators; drywall and ceiling tile installers; and carpet, floor and tile installers and finishers are also included in this category. First line supervisors, foremen, and helpers in these trades are also grouped in this category..

**INSTALLATION, MAINTENANCE AND REPAIR:** Occupations involving the installation, maintenance, and repair of equipment are included in this group. Examples of job titles found here are heating, ac, and refrigeration mechanics and installers; telecommunication line installers and repairers; heavy vehicle and mobile equipment service technicians and mechanics; small engine mechanics; security and fire alarm systems installers; electric/electronic repair, industrial, utility and transportation equipment; millwrights; riggers; and manufactured building and mobile home installers. First line supervisors, foremen, and helpers for these jobs are also included in the category.

**MATERIAL MOVING WORKERS:** The job titles included in this group are Crane and tower operators; dredge, excavating, and lading machine operators; hoist and winch operators; industrial truck and tractor operators; cleaners of vehicles and equipment; laborers and freight, stock, and material movers, hand; machine feeders and offbearers; packers and packagers, hand; pumping station operators; refuse and recyclable material collectors; and miscellaneous material moving workers.

**PRODUCTION WORKERS:** The job titles included in this category are chemical production machine setters, operators and tenders; crushing/grinding workers; cutting workers; inspectors, testers sorters, samplers, weighers; precious stone/metal workers; painting workers; cementing/gluing machine operators and tenders; etchers/engravers; molders, shapers and casters except for metal and plastic; and production workers.

<p><u>White</u> (not of Hispanic Origin)- All persons having origins in any of the original peoples of Europe, North Africa, or the Middle East.</p> <p><u>Black</u>(not of Hispanic Origin)- All persons having origins in any of the Black racial groups of Africa.</p> <p><u>Hispanic</u>- All persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race.</p>	<p><u>Asian or Pacific Islander</u>- All persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This area includes China, India, Japan, Korea, the Philippine Islands, and Samoa.</p> <p><u>American Indian or Alaskan Native</u>- All persons having origins in any of the original peoples of North America, and who maintain cultural identification through tribal affiliation or community recognition.</p>
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**BIDDER CONTRACT COMPLIANCE MONITORING REPORT**

**PART I - Bidder Information**

Company Name Street Address City & State Chief Executive	Bidder Federal Employer Identification Number _____ Or Social Security Number _____
Major Business Activity (brief description)	Bidder Identification (response optional/definitions on page 1)  -Bidder is a small contractor. Yes ___ No ___ -Bidder is a minority business enterprise Yes ___ No ___ (If yes, check ownership category) Black ___ Hispanic ___ Asian American ___ American Indian/Alaskan Native ___ Iberian Peninsula ___ Individual(s) with a Physical Disability ___ Female ___
Bidder Parent Company (If any)	- Bidder is certified as above by State of CT Yes ___ No ___
Other Locations in Ct. (If any)	

**PART II - Bidder Nondiscrimination Policies and Procedures**

1. Does your company have a written Affirmative Action/Equal Employment Opportunity statement posted on company bulletin boards? Yes ___ No ___	7. Do all of your company contracts and purchase orders contain non-discrimination statements as required by Sections 4a-60 & 4a-60a Conn. Gen. Stat.? Yes ___ No ___
2. Does your company have the state-mandated sexual harassment prevention in the workplace policy posted on company bulletin boards? Yes ___ No ___	8. Do you, upon request, provide reasonable accommodation to employees, or applicants for employment, who have physical or mental disability? Yes ___ No ___
3. Do you notify all recruitment sources in writing of your company's Affirmative Action/Equal Employment Opportunity employment policy? Yes ___ No ___	9. Does your company have a mandatory retirement age for all employees? Yes ___ No ___
4. Do your company advertisements contain a written statement that you are an Affirmative Action/Equal Opportunity Employer? Yes ___ No ___	10. If your company has 50 or more employees, have you provided at least two (2) hours of sexual harassment training to all of your supervisors? Yes ___ No ___ NA ___
5. Do you notify the Ct. State Employment Service of all employment openings with your company? Yes ___ No ___	11. If your company has apprenticeship programs, do they meet the Affirmative Action/Equal Employment Opportunity requirements of the apprenticeship standards of the Ct. Dept. of Labor? Yes ___ No ___ NA ___
6. Does your company have a collective bargaining agreement with workers? Yes ___ No ___ 6a. If yes, do the collective bargaining agreements contain non-discrimination clauses covering all workers? Yes ___ No ___ 6b. Have you notified each union in writing of your commitments under the nondiscrimination requirements of contracts with the state of Ct? Yes ___ No ___	12. Does your company have a written affirmative action Plan? Yes ___ No ___ If no, please explain.  13. Is there a person in your company who is responsible for equal employment opportunity? Yes ___ No ___ If yes, give name and phone number. _____

1. Will the work of this contract include subcontractors or suppliers? Yes\_\_ No\_\_

1a. If yes, please list all subcontractors and suppliers and report if they are a small contractor and/or a minority business enterprise. (defined on page 1 / use additional sheet if necessary)

1b. Will the work of this contract require additional subcontractors or suppliers other than those identified in 1a. above?

Yes\_\_ No\_\_

**PART IV - Bidder Employment Information**

Date:

JOB CATEGORY *	OVERALL TOTALS	WHITE (not of Hispanic origin)		BLACK (not of Hispanic origin)		HISPANIC		ASIAN or PACIFIC ISLANDER		AMERICAN INDIAN or ALASKAN NATIVE	
		Male	Female	Male	Female	Male	Female	Male	Female	male	female
Management											
Business & Financial Ops											
Marketing & Sales											
Legal Occupations											
Computer Specialists											
Architecture/Engineering											
Office & Admin Support											
Bldg/ Grounds Cleaning/Maintenance											
Construction & Extraction											
Installation , Maintenance & Repair											
Material Moving Workers											
Production Occupations											
TOTALS ABOVE											
Total One Year Ago											
FORMAL ON THE JOB TRAINEES (ENTER FIGURES FOR THE SAME CATEGORIES AS ARE SHOWN ABOVE)											
Apprentices											
Trainees											

\*NOTE: JOB CATEGORIES CAN BE CHANGED OR ADDED TO (EX. SALES CAN BE ADDED OR REPLACE A CATEGORY NOT USED IN YOUR COMPANY)

1. Which of the following recruitment sources are used by you? (Check yes or no, and report percent used)				2. Check (X) any of the below listed requirements that you use as a hiring qualification  (X)	3. Describe below any other practices or actions that you take which show that you hire, train, and promote employees without discrimination
SOURCE	YES	NO	% of applicants provided by source		
State Employment Service				Work Experience	
Private Employment Agencies				Ability to Speak or Write English	
Schools and Colleges				Written Tests	
Newspaper Advertisement				High School Diploma	
Walk Ins				College Degree	
Present Employees				Union Membership	
Labor Organizations				Personal Recommendation	
Minority/Community Organizations				Height or Weight	
Others (please identify)				Car Ownership	
				Arrest Record	
				Wage Garnishments	

Certification (Read this form and check your statements on it CAREFULLY before signing). I certify that the statements made by me on this BIDDER CONTRACT COMPLIANCE MONITORING REPORT are complete and true to the best of my knowledge and belief, and are made in good faith. I understand that if I knowingly make any misstatements of facts, I am subject to be declared in non-compliance with Section 4a-60, 4a-60a, and related sections of the CONN. GEN. STAT.

(Signature)	(Title)	(Date Signed)	(Telephone)
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## CONSTRUCTION CONTRACT

**THIS AGREEMENT**, made and concluded by and between the **City of Bristol**, a Municipal Corporation organized and existing under the laws of the State of Connecticut, acting herein by its Mayor, duly authorized, hereinafter designated the "City", party of the first part and **[Company Name]**. (being the party named in the attached copy of the Proposal), hereinafter designated the "Contractor", party of the second part.

**WITNESSETH**, that said Contractor has agreed, and by these presents does for its, their, or its heirs, executors, administrators, successors, and assigns covenant, promise and agree to and with the said City for the consideration hereinafter mentioned and contained, and under the penalty expressed in Bonds hereunto annexed, that said Contractor shall and will, at his, its, or their own proper charge, costs and expense do and perform all the work and furnish all materials and labor necessary or proper, and build in good, firm and in substantial manner, with appurtenances of every kind complete in accordance with this Contract and the specifications which are a part hereof, and in accordance with such further plans and directions as have been made or may be made from time to time the work referred to as "**Contract 2CXX-xxx [contract name]**" in the amount of **[Contract amount in words] ([Contract amount in number format])**.

All to be in accordance with the terms of the Proposal for said work submitted to the City of Bristol on **[bid due date]** and accepted by said City on **[council approval date]** and made a part of this Contract.

The Instructions to Bidders, the Bid Proposal, General Provisions, the Specifications, together with Special Provisions, Addenda and the Bonds and any and all additions which may be inserted or attached to any or all of the sections listed above, together with the drawings named in the Instructions to Bidders are made a part of this Contract. The general features of said work are shown in the drawings referred to above which are made a part of this Contract. The Engineer shall furnish the Contractor with additional plans as may be necessary to show the details of construction, which are to be considered as illustrating the requirements and specifications set forth in this Contract and are to be followed by the Contractor in carrying out the work done hereunder. All work is to be performed under the direction and inspection of the City Engineer who shall interpret the intent and methods described in the plans and specifications.

The Contractor agrees to indemnify, defend, and save harmless, the City of Bristol, as well as its officers, agents, and employees from any and all claims and losses accruing or resulting from the performance of this Contract, and from any and all claims and losses accruing or resulting to any person, firm or Corporation who may be injured or damaged by the Contractor in the performance of this Contract.

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 (h) of C.G.S. 31-53, 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.

**IN WITNESS WHEREOF**, the parties hereto have hereunto set their hands and seals this \_\_\_\_\_ day of \_\_\_\_\_, 20XX.

Signed in the presence of:

\_\_\_\_\_  
\_\_\_\_\_

**The City of Bristol, Connecticut**

By: \_\_\_\_\_  
**Mayor [name]**

Signed in the presence of:

\_\_\_\_\_  
\_\_\_\_\_

**[Contractor Name]**

By: \_\_\_\_\_  
**[Officer name, Title]**

This Contract was **approved by vote of the City Council** of Bristol, Connecticut on the \_\_\_\_ day of \_\_\_\_\_, 20XX.

\_\_\_\_\_  
City Clerk

**Approved as to Form**  
Office of Corporation Counsel

By \_\_\_\_\_  
\_\_\_\_\_ 20XX

**Approved as to Technical Content**  
Department of Public Works

By \_\_\_\_\_  
\_\_\_\_\_ 20XX

**Approved as to Appropriations**  
Board of Finance, City of Bristol, Connecticut

By \_\_\_\_\_  
\_\_\_\_\_ 20XX





**WAIVER OF NOTICE OF SPECIAL MEETING  
OF THE BOARD OF DIRECTORS**

The undersigned, being all of the Board of Directors of [COMPANY NAME]

hereby waive written notice of a Special Meeting of the Board of Directors to be held at the Office  
of \_\_\_\_\_

on \_\_\_\_\_, 20\_\_\_\_, at \_\_\_\_\_ a.m./p.m.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



## SECTION 007201 GENERAL PROVISIONS

### 1. **INSPECTION:**

Inspectors representing the Engineer shall be authorized to inspect all work done and all materials furnished including the manufacture of said materials. Should a dispute arise as to the work performed or the materials supplied, the inspector may suspend the work or reject the material. The question of suitability will be decided only by the Engineer. The inspector is not authorized to revoke, alter, enlarge, relax or release any requirements of the specifications nor approve or accept any portion of the work, or issue any instructions contrary to the plans and specifications. No advice given by the inspector shall be binding on the City or release the Contractor from his obligations. The inspector shall perform no other duties than to inspect the work or materials; he shall not interfere with nor take part in the management of the work.

### 2. **ENGINEER TO BE JUDGE OF WORK:**

The Engineer shall be the judge of the character, nature and fitness of all work and materials furnished under the contract and the amount, quality and classification of the several kinds of work for which payment is to be made and he shall decide as to the meaning, intent and performance of the contract. The entire work shall be done under his supervision and to his satisfaction, and his estimates and his decisions upon all questions relating to said work shall be a condition precedent to the right of said Contractor to payments under the Contract.

### 3. **DISCREPANCIES, ERRORS AND OMISSIONS:**

The drawings and specifications are intended to be explanatory of each other, but should any discrepancy appear or any misunderstanding arise as to the import of anything contained in either, the interpretation and decision of the Engineer shall be final and binding on both parties to the Contract. Each section shall be a complete job and work implied shall be done as if specified or shown on the plans or required for a complete job under the respective work and shall be done by the Contractor without extra charge. In the case of discrepancies between the drawings and the written specifications in general, the drawings shall be considered to supersede the written specifications.

### 4. **LOCATION OF MAJOR COMPONENTS OF THE WORK:**

Major components of the work will be located and staked substantially as indicated on the drawings but the right is reserved by the Engineer to make such modification in the

location as may be found necessary. Payment for such variations or changes will be at the unit prices for like work listed in the Proposal.

**5. LAYOUT OF THE WORK:**

The Contractor will have the necessary base lines and control grades staked out as required for the satisfactory completion of the work under this Contract. The Contractor shall use all reasonable precautions to prevent such lines and grades from being disturbed. The cost of resetting any stakes required to be reset because of lack of such reasonable precaution by the Contractor, his men, his equipment or anyone indirectly connected with the job may be charged to the Contractor. The Contractor shall furnish a person or persons to assist in placing stakes and cutting of brush. If, at any time, the Contractor has reason to believe the stakes are wrong, the Contractor shall notify the Engineer. Any work put in that is obviously wrong shall be removed and corrected at the Contractor's expense. The Contractor shall layout his work from the base lines and control grades. The Contractor shall give all necessary assistance to the inspector in checking the line and grade of the work.

**6. SUBMITTALS:**

The Contractor shall submit plans, drawings, details or written statements of the methods of construction for the various units of the work as required by the Engineer, all of which shall be subject to the approval of the Engineer.

**7. DISCREPANCIES, ERRORS AND OMISSIONS:**

The drawings and specifications are intended to be explanatory of each other, but should any discrepancy appear or any misunderstanding arise as to the importance of anything contained in either, the interpretation and decision of the Engineer shall be final and binding on both parties to the Contract. Each section shall be a complete job and work implied shall be done as if specified or shown on the plans or required for a complete job under the respective work and shall be done by the Contractor without extra charge. In the case of discrepancies between the drawings and the written specification in general, the drawings shall be considered to supersede the written specifications.

**8. ADDITIONAL PLANS TO BE FURNISHED AS REQUIRED:**

The general features of said work are shown on the Contract drawings on file in the office of the Engineer and the Engineer will furnish the Contractor with such additional plans as may be necessary to show the details of construction which are to be considered as illustrating the requirements set forth in the Contract and Specifications and are to be followed by the Contractor in carrying out the work done thereunder. When

requested by the Engineer, the Contractor shall submit plans, drawings, details or written statements of the methods of construction for the various units of the work, which shall be subject to the approval of the Engineer.

**9. CHANGES AND EXTRA WORK:**

The Engineer shall have the power and without notice, or approval of Surety, to alter and change the line, grade, plan, form, position, dimension or material of or for the work herein contemplated, or any part thereof, in a manner not inconsistent with the general layout or project. This may be done either before the signing of the Contract or after starting of the work, or the Engineer may order in writing any extra work which may be deemed necessary in connection with the work. The Engineer may increase or decrease the unit quantities in the Proposal. If such alteration diminishes the quantity of work to be done, it shall not be a basis for a claim for payment for damages for anticipated profits not received. An increase shall be paid for according to work actually done and at the prices established for such or like work in the Contract or, in case no such price is established, then at actual reasonable cost as determined by the Engineer and the Contractor, as Lump Sum or Unit Prices as mutually agreed to before starting work or at actual cost plus as agreed to.

For work done under "Cost Plus", the compensation shall be as follows:

- (a) Monies actually paid for labor and foreman as required and as shown on the payroll plus 15% to cover insurance, taxes, social security, etc.
- (b) Actual cost for material used on job.
- (c) Power operated equipment as set forth in the equipment schedule applying to like jobs.

If equipment rental rates are agreed to, no percentage shall be added to these amounts.

Full payment shall be the sum of the above items which apply plus 15% for overhead and profit. Any extra work by a subcontractor will be computed as above specified with 10% for overhead and profit for the General Contractor.

**10. CLAIM BY CONTRACTOR FOR EXTRA WORK:**

Should the Contractor feel he has an extra payment due him for extra work performed or materials furnished or damages sustained in connection with any unit of the work, he shall present his claim in writing to the Engineer within ten (10) days after said extra work, furnishing extra materials or damages, itemized labor, material (including vouchers) and equipment used. The Engineer will review the claim and secure such advice and guidance

from the proper authority or disinterested persons as may be necessary to properly settle said claim. No claim entered after ten (10) days or not in proper form will be accepted by the Engineer. A claim for extra work by the Contractor shall not be a reason to suspend works. The Contractor shall continue work during the resolution of the claim for extra work.

**11. CONTRACTOR RESPONSIBLE FOR ENTIRE WORK UNTIL ACCEPTED:**

The Contractor shall have charge of and be responsible for the entire work until its final completion and acceptance, and any imperfect or unfaithful work or defective materials that may be discovered at any time before the final completion and acceptance of the work or work injured or destroyed by the elements or the public, shall be corrected immediately on the requirement of the Engineer.

The presence of an inspector shall not relieve the Contractor of responsibility because of failure due to poor materials or workmanship and if the work is obviously constructed in error.

**12. PROGRESS SCHEDULE:**

The Engineer will require that the Contractor submit a schedule of his work. The schedule may be subject to amendment as work progresses. The City of Bristol reserves the right to withhold periodic payments pending the submission of an updated schedule.

**13. WORK AND MATERIALS TO BE OF BEST QUALITY:**

All work done and materials furnished shall be new and of the best quality customarily used in or furnished for installations of this type. All materials shall be used in conformance with the manufacturer's recommendations. The absence of requirements or details in the specifications or drawings which are usually included in first-class construction of this kind shall not excuse the Contractor for their omission in his work. The Engineer will reject all defective or damaged materials or any material not in his opinion in conformity with the specifications. Materials rejected shall be set aside, conspicuously marked and removed from the site promptly. The Contractor shall furnish the Engineer with copies of delivery slips showing weights and/or volume of materials delivered, if so requested. If requested by the Engineer, the Contractor shall furnish test reports, mill certificates and/or samples for testing by the Engineer.

**14. DEFECTIVE WORK:**

The inspection of the work shall not relieve the Contractor of any of his obligations to fulfill his Contract as herein specified, and any defective work shall be made good, and any

unsuitable materials shall be rejected, notwithstanding that such work and materials have been previously overlooked by the Engineer and accepted or estimated for payment. This shall cover any material furnished by the City which shall be damaged or rendered defective by handling or improper installation by the Contractor, his agents or employees and shall be made good and replaced at the Contractor's own expense.

**15. WORKERS, SUPERVISION, AND MAINTENANCE:**

The Contractor shall employ only competent, faithful, skilled, and proficient tradespeople to do the work required of them, and whenever the Engineer shall inform him that any man on the work is in his opinion incompetent or unfaithful, he shall discharge him from the work and shall not again employ him for work under this Contract. Helpers and Apprentices may be used, but only under direct supervision of the Job Foreman.

The Contractor shall keep a competent superintendent on the Project whenever work is being done, who shall receive orders in the Contractor's absence and shall obey them as if received by him personally.

Any Contractor whose place of business is located outside the City must make arrangements satisfactory to the Engineer for emergency repair work or protection that may be necessary during periods of shutdown of the work. If this is not done, the Engineer will make arrangements and any cost will be deducted from monies due the Contractor.

**16. COMPLIANCE WITH LAW:**

The Contractor shall keep himself informed of all existing laws, State, Federal, Municipal Ordinances and Regulations affecting those employed and any affecting the conduct of the work and shall protect and indemnify the City of Bristol, its officers and agents against any claim or liability arising from or based upon violation of any such law, ordinance, regulation, order of decree, whether by himself or his employees. All work performed and equipment used shall comply with all pertinent OSHA, Federal, State and Local Regulations.

**17. NON-USE OF FRACKING WASTE MATERIAL:**

Consistent with City of Bristol Code of Ordinances Section 10-15(D), no materials containing natural gas waste or oil waste shall be utilized in providing construction and/or maintenance of any publicly owned and/or maintained road or real property within the City. Additionally, no purchase or acquisition of materials containing natural gas waste or oil waste, for which use is for construction or maintenance of any publicly owned and/or maintained road or real property within the City, shall be permitted.

In response to a violation of these provisions, the City may require remediation of any damage done to any land, road, building, aquifer, well, watercourse, air quality or other asset, be it public or private, within the City of Bristol. The City may also impose fines in accordance with Section 1-11 of the Code of Ordinances for any such violation, and any other remedies allowable under the law.

**18. OCCUPYING PRIVATE LAND:**

The Contractor shall not (except after written consent from the owner) enter or occupy with men, tools, material or equipment, any land outside the rights of way or property of the City. Neither shall he nor his men remove anything from any private land without proper written authority. In general, the Contractor shall park his equipment and store his material on the City property or if approved, within the public street or on the City right of way.

**19. FIRE HYDRANTS:**

No material or other obstructions shall be placed within fifteen (15') feet of any fire hydrant which must at all times be readily accessible to the Fire Department. No hydrant shall be opened at any time without permission of the Fire Department.

**20. CONVENIENCE OF PUBLIC:**

One-way traffic on all streets shall be maintained at all times, except as otherwise approved by the local traffic authority, then detours must be provided. Closing of streets and detours must be approved by the Director of Public Works, the Police Chief and the Fire Chief through the Engineer. Plans identifying signing, detour routes, etc. must be submitted to the Engineer for approval by the City. The Contractor shall provide all signs, barricades, flashers, batteries, etc. as required by the City; the cost of which is considered included in the Traffic items of the Bid Proposal.

During the progress of the work, the convenience of the public and of the residents along the street must be provided for as far as possible. No Public Street, or sidewalk, or private driveway shall be blocked after completion of the day's work except due to unavoidable circumstances or as authorized by the Engineer.

**21. WATER:**

The Contractor must make arrangements for securing water needed as part of the work and it shall be classed as materials furnished by the Contractor with cost included in the several items of the Contract.

**22. DRINKING WATER AND SANITARY CONVENIENCES:**

Drinking water shall be provided from an approved source, kept safe and fresh and served in simple service paper cups. Sanitary conveniences shall be provided for workmen on the project in strict accordance with the health regulations of the City.

**23. OBLIGATION AND LIABILITY OF CONTRACTOR:**

The Contractor shall do all the work and furnish all the materials, tools and appliances unless otherwise specified and everything necessary or proper for performing and completing the work and within the time specified herein. He shall complete the work to the satisfaction of the Engineer and at the prices in the Proposal or as agreed under extra work.

The Contractor shall coordinate his operations with other contractors that may be working in the project area.

The Contractor shall take all responsibility for work done under this Contract, for protection of work, for injuries to employees, for injuries to the public and damage to property and utilities on or about the work and the responsibility of anyone hired by him directly or indirectly. The Contractor shall assume the defense of all claims of whatsoever character against the Contractor, the City, and shall indemnify, save harmless and insure the City, its officers or agents against all claims arising from the work under this Contract.

If, at any time, in the opinion of the Engineer, work is not properly lighted, barricaded and in all respects safe, both in respect to the work completed or to public travel or for the workmen and/or adjacent property, public or private, and

circumstances are such that the Contractor after being notified, or if he cannot be readily reached, or he cannot or does not remedy the conditions immediately, then the Engineer may have the conditions rectified and the Contractor shall pay all expenses for said material, labor, etc., or it may be deducted from monies due him. Such action of the Engineer, or his failure to take such action, shall in no way relieve the Contractor of his obligations and liabilities.

The Contractor shall execute the work in such a manner as to prevent accidents or injury to persons and to interfere as little as possible with public travel; and shall provide railings or suitable barricades to exclude persons and animals from open trenches and obstructions; and shall employ a watchman or additional safeguards when and as required or necessary. Warning signs shall be provided on streets adjacent to the project for 100 feet before beginning of construction and maintained until final acceptance or the approval of the Engineer secured. These shall be properly lighted from sundown to sunrise. Color of all

warning lights shall be amber. Barricades and lights shall be maintained along the line of open excavations, closed sections of road; and from sundown to sunrise shall have sufficient warning lights.

If the Contractor, upon order of the Engineer or his agent, does not comply with the above, the City may take such steps as are necessary and deduct the cost from monies due the Contractor. Such action of the Engineer, or his failure to take such action, shall in no way relieve the Contractor of his obligations and liabilities.

**24. SUBLETTING OR ASSIGNMENT:**

The Contractor shall not sublet any portion of the work without written permission. In no case may he sublet more than 49% of the monetary value of the Contract. The major units of work of the Contract shall be performed by the Contractor.

If the Contractor sublets any part of the work, this does not relieve him or the bonding company of liabilities and obligations to the City. There is no contractual relationship between any subcontractor and the City. The Engineer deals only with the Contractor; subcontractors are recognized as employees only.

The Contractor must not assign or dispose of his Contract in any way without the written consent of the Engineer in conjunction with that of the Mayor. Disposal must be for a cause only.

**25. WORK AREA:**

Immediately after the completion of the work or any substantial portion of it, the Contractor shall remove from it all unused material, refuse and surplus dirt placed by him on or in the vicinity of the work or resulting from the prosecution thereof; and restore the street or City or private property to a condition as clean as before the work was begun without extra charge and shall make good all damage to property, belonging either to the City, or residents caused by the Contractor in the prosecution of the work.

The Contractor shall protect all trees, shrubbery, fences, etc., and replace any removed or damaged to the full satisfaction of the Engineer. Access to the work on easements or right-of-ways shall be from the City street directly to the work site; no access will be allowed from private property.

During the work, the Contractor shall not deposit material in such a manner so as to block or interfere with normal traffic and/or vehicles within the travelway. The Contractor shall erect adequate barricades as required to protect vehicles and/or pedestrians from the work area.

During the progress of the work, during any shutdown, and until final acceptance of the work; the Contractor shall maintain all constructed surfaces (street, driveway, sidewalk, etc.). Settlements shall be repaired to the full satisfaction of the Engineer at the Contractor's expense. Should the Contractor fail to perform such work upon order of the Engineer within a reasonable time, the Engineer will make arrangements to have the necessary work done and the cost of said work deducted from monies due the Contractor.

The Contractor shall make arrangements for disposal of surplus construction materials. The cost of disposal, landfill permits, associated dumping fees, shall be considered included in the total bid amount. The job site shall be left in a clean condition meeting the full satisfaction of the Engineer.

**26. PROGRESS AND FORFEITURE OF CONTRACT:**

If at any time the Engineer shall be of the opinion that the said work is unnecessarily delayed, and will not be finished in the prescribed time, or that the Contractor is willfully violating any of the conditions of the Contract, or is executing the same in bad faith, he shall notify the Contractor, in writing, to that effect. If the Contractor does not, within five (5) days thereafter, take such measures as will in the judgement of the Engineer insure the satisfactory completion of the work, the Engineer may then, in writing, notify the Contractor to discontinue all the work under the Contract. The Contractor shall immediately respect said notice and stop work and cease to have any rights to possession of the ground and shall not remove any portion of the plant or any materials after receiving such notice. The Engineer shall notify the Contract Surety, in writing, of his action and the reason(s) for such action. The Engineer shall report his actions to the City together with the reason(s) for such actions.

The City shall take such action as it deems necessary to complete the work under the Contract to the City's satisfaction. The City may rescind the Engineer's notice to the Contractor to discontinue work and order the Contractor to complete the Contract within such terms as it may specify or the City may inform the Contract Surety of its (Contract Surety's) responsibility to complete the work as specified under the terms of the Contract. Surety shall elect to complete the work or have the City complete it. If the City completes the work, it shall thereupon have the power to direct the Engineer to place such and so many persons as he may deem advisable by contract, or otherwise, to work at and complete the work herein described and to use such materials as he may find upon the line of said work, or to procure other materials for the completion of the same and to charge the expense, whether of labor or materials, or otherwise. to the Contract and the expense so charged shall be deducted and paid by the City out of such monies as may be then due or may at any time thereafter become due to the Contractor under and by virtue of the Contract or any part thereof; and in case such expense is less than the sum which would

have been payable under the Contract if the same had been completed by the Contractor, said Surety shall be entitled to receive the difference. In case such expense is greater, the Contract Surety shall pay the amount of such excess due to the City.

**27. STREET AND PRIVATE PROPERTY TO BE LEFT CLEAN, MAINTENANCE OF ROAD SURFACES:**

Immediately after the completion of the work or any substantial portion of it, the Contractor shall remove from it all unused material, refuse and surplus dirt placed by him on or in the vicinity of the work or resulting from the prosecution thereof; and restore the street or City or Private property to a condition as clean as before the work was begun without extra charge and shall make good all damage to property, belonging either to the City or residents along the street caused by the Contractor in the prosecution of the work. The Contractor shall protect all trees, shrubbery, fences, etc., and replace any removed or damaged to the satisfaction of the Engineer. Access to the work on easement or right of way shall be from a City street directly to the work site; no access will be allowed from private property.

During the construction, the Contractor shall not deposit excavated material within the travelway in such a manner so as to block or interfere with the flow of traffic within the travelway. Such excess material shall be trucked to a suitable stockpile or disposal site. The Contractor shall erect such barricades as may be necessary to prevent vehicles from driving over any area, public or private, outside the travelway of the street.

During the progress of the work, during any shutdown, and until final acceptance of the work; the Contractor shall maintain the street surface. Settled trenches shall be filled and potholes patched with suitable bituminous paving material as a part of the several bid prices for items of the Contract. Should the Contractor fail to perform such work upon order of the Engineer within a reasonable time, the Engineer will make arrangements to have the necessary work done and the cost of said work deducted from monies due the Contractor.

**28. EXCAVATION, BACKFILL AND SURFACING:**

The term excavation used in the specifications shall mean the removal to line and grade and the satisfactory disposal of all materials encountered and the removal of all obstructions necessary to the preparation of the subgrade of all proposed improvements. All surplus excavated material not re-used in the work shall be the property of the City of Bristol. The Contractor shall be responsible for hauling such material a one-way maximum distance of five (5) miles to a location determined by the Owner. Any surplus excavated material rejected by the City shall be legally disposed of off the site by the Contractor. This shall not be considered as an extra but shall be included in the overall bid.

**29. DELAY IN TIME OF COMPLETION, NO CLAIM FOR DAMAGES:**

The City may reasonably delay the beginning of the work or any part thereof, if necessary because of weather conditions. The Contractor shall have no claim for damages on account of said reasonable delay, but if a time clause is carried in the Contract, so much additional time shall be allowed as the Engineer computes such delay has influenced the completion by the Contractor. The Engineer shall certify such additional time in writing.

In case the Contractor shall suffer damage from loss of time, where the same is caused by or under the direction of the City, the condition of the weather, or by any circumstances so unusual that they could not be foreseen previous to or avoided during the construction of the work (all of which shall be determined by the Engineer who shall certify the same in writing); the time during which work was so suspended shall be excluded and the time of completion extended by a corresponding number of days.

Neither an extension of time for any reason beyond the date fixed for the completion of the work, nor the acceptance of any part of the work comprised in these specifications subsequent to the said date, shall be deemed to be a waiver by the said Contractor of the right to abrogate the Contract for abandonment or delay in the manner herein provided.

**30. UTILITIES AND PIPES ENCOUNTERED:**

The location of existing structures and pipes if shown on the drawings are in accordance with the best available information in the City's possession. The completeness and accuracy of said information is not guaranteed and the Contractor shall have no grounds for additional compensation because of their variation or encountering pipes and structures not shown on the drawings.

No borings have been made unless noted on the plans, and the City presents no information concerning soil, groundwater or rock; and because of encountered conditions other than shown on the drawings, the Contractor shall have no grounds to claim additional expense due to lack of such information.

If pipes or appurtenances of the City are encountered, which in the judgment of the Engineer must be moved, then that work shall be done as an extra work order. This extra compensation does not apply to pipes or appurtenances of a utility, which the utility itself moves. If conditions call for relocation; unit prices govern for that work, if applicable, otherwise it shall be under extra work order.

The Contractor shall contact "Call Before You Dig" to have all utilities locate and mark their pipes and structures prior to his beginning work.

No extra will be allowed or paid for except as hereinbefore stated for "Extra Work".

**31. STORAGE OF MATERIALS AND EQUIPMENT:**

The Contractor shall make arrangements to store his material, vehicles, equipment, etc.

During the prosecution of the work, the Contractor shall not store material, equipment, vehicles, etc. within any travelway in such a manner so as to block or interfere with the flow of traffic within the travelway.

**32. SAFETY:**

The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

All work done and equipment used shall comply with all pertinent O.S.H.A., Federal, State, Municipal, and Local regulations, laws, ordinances and Regulations affecting those employed and any affecting the conduct of the work.

The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner.

The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

- (1) employees on the work site and other persons who may be affected thereby;
- (2) the work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Suppliers; and
- (3) other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

Not later than thirty (30) days after the date a contract is awarded, the awarded contractor shall furnish proof to the Labor Commissioner that all employees performing manual labor on or in such public project, pursuant to such contract, have completed a course of at least ten (10) hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration, or in the case of telecommunications employees, have completed at least ten (10) hours of training in accordance with 29 CFR 1910.268.

**33. GUARANTEES:**

The Contractor shall guarantee all his work to be free from defects due to workmanship or material used for a period of one (1) year from the final completion of all work on the Contract. Said one (1) year period shall begin on the date of payment of the semi-final estimate by the City.

Should the Contractor, during the guarantee period upon notification by the Engineer in writing within five (5) days, fail to begin making necessary repairs to the satisfaction of the Engineer, action may be taken by the Engineer to have the repairs made either by using the City's own men and equipment, by force account or cost plus method, or by contract between the City and a contractor selected by the City. The cost shall be taken from monies due the Contractor. Any cost exceeding that held shall be paid by the Contractor or the City may call upon the bond Surety to pay said extra cost.

**34. CONTRACTOR, HIS INSURANCE CARRIER AND BOND SURETY, LIABLE FOR CLAIMS OR DAMAGES:**

It shall be the duty of the Contractor and his Insurance Carrier and Bond Surety to indemnify and save harmless the City from all suits or actions of any name or description, brought against them or the City for or on account of any injuries or damages received or sustained by any party or parties by or from the Contractor, his agents or employees in the construction of the work, or in consequence of any negligence in guarding the same or any improper materials used in its construction or by or on account of any act or omission of the Contractor, his agents or employees.

**35. PARTIAL PAYMENT ESTIMATES:**

Within three (3) days after the end of a month in which substantial work has been performed, the Contractor will prepare an estimate of the work performed to date and the amount of monies due the Contractor for said work. The Contractor shall utilize a Schedule of Values submitted for the project in preparing said estimate. The payment estimate shall

be based on the per cent of work completed in acceptable manner at the Lump Sum price stated in the Proposal. Extra work will be computed and paid as stated on the Extra Work Order accepted by the Contractor and approved by the City. The payment estimate shall be submitted to the Contractor and he shall indicate his acceptance by signing said payment estimate. The payment to the Contractor shall be in the amount of 95% of the estimated amount due, minus previous payments and minus any monies retained by the City for purposes hereinbefore specified. Payments shall be made to the Contractor as soon as disbursement policies of the City allow, generally within 30 days of approval of the payment.

The amount retained shall be held by the City until final completion of the work. Partial payments do not constitute acceptance of the work or any portion thereof. The presence of the Engineer, or his representative, on the work or inspection of said work in progress does not constitute acceptance of the work, materials used or furnished until final completion of the entire work contemplated under the Contract.

**36. SEMI-FINAL PAYMENT ESTIMATE:**

Upon completion of all work under this Contract in acceptable manner, the Engineer will certify to the Contractor in writing completion of the work in conformance with the plans and specifications. The Engineer will then prepare "as built" quantities as measured during and/or upon completion of the work. The semi-final payment shall be in the amount of 95% of the final payment due, minus previous payments and minus any monies retained by the City as hereinbefore specified under "Partial Payments" above. The 5% retained shall be withheld by the City for a period of one (1) year following payment of the semi-final payment estimate.

The Performance Bond and Labor and Material Payment Bond shall not be released until final payment and final acceptance of the entire work is made as a guarantee against claims and suits that may be entered against the City for actions or negligence of the Contractor in the performance of the work. The 5% is retained to guarantee the repairs that may be ordered by the Engineer for defective materials or workmanship during the one (1) year maintenance period. The City reserves the right to retain in excess of the 5% should it deem additional guarantee necessary for legal claims against the City resulting from actions under this Contract.

**37. FINAL PAYMENT:**

At the end of the one (1) year guarantee period, the Engineer shall inspect the work and shall notify the Contractor of any defects not previously rectified. When the whole work is confirmed to be fully complete in conformance with the plans and specifications with no defects, the Engineer shall prepare a final payment, which payment shall be all monies due

the Contractor for the total work performed under this Contract less previous payments, monies deleted for uncorrected deficiencies, or Payments of claims or damages to others paid by the City resulting from actions under this Contract. The final payment will not be made until the City is satisfied that said City, its agents and employees, are not liable to suits and claims resulting from work under this Contract and that all bills for labor and materials used in the Contract have been paid in full.

Prior to the release of any final payment, the contractor is required to provide to the City final lien waivers from all of its subcontractors and suppliers, and shall additionally be required to provide acknowledgment of its surety for the Labor and Materials Payment Bond that it accepts release of the final payment to the Contractor.

The Contractor will be required to sign a certificate that this final payment liquidates the Contract and releases the City from any claims by him under the Contract. Said final payment will be made to the Contractor as soon thereafter as the disbursement policies of the City permit. The final payment to the Contractor will constitute final acceptance of the entire work by the City of Bristol.

A draft final release form is enclosed on the next page.





## **NOTICE TO CONTRACTOR – AS-BUILT DRAWING**

The Contractor is hereby notified that they are to provide As-Built drawing of this project called Installation of Concrete walks on Shrub Road. This shall include concrete walks, concrete ramps, painted crosswalks, the new edge of road including those sections of the south side of shrub road that was relocated, drainage, retaining walls, guiderails, etc. The Contractor is further to provide the City of Bristol with a AutoCAD file of the As-Built drawing. This is to be considered incidental to the Project Closeout responsibilities of the Contractor and shall be paid for under the Item 0975002 Mobilization and Project Closeout.

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

### **Article 1.08.04 - Limitation of Operations - Add the following:**

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

#### **Shrub Road, Jerome Avenue**

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

#### **Additional Restrictions:**

- A. During the shoulder widening, the Contractor will be allowed to maintain an alternating one-way traffic operation controlled by either a Traffic person Municipal Police Officer or by Trafficperson Uniformed Flagger.
- B. The Contractor will not be allowed to close Shrub Road or Jerome Avenue and detour traffic. Two lanes must remain open at all times.
- C. The Contractor will not be allowed to perform any blasting operations.

#### **Additional Lane Closure Restrictions**

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

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

**ITEM 0201012A**

**REMOVAL OF TREES**

**DESCRIPTION:**

The work covered under this item includes furnishing all labor, equipment, materials, and incidentals necessary to remove the trees specifically called out on the contract drawings.

**CONSTRUCTION METHODS:**

The Contractor shall remove only those trees specified in the contract documents. Contractor to coordinate with the City of Bristol Engineer prior to any tree removal. The tree shall be removed and become the property of the contractor. All debris (leaves & branches) shall be immediately cleaned up and become the property of the contractor as well.

The Contractor shall be responsible and liable for any damage to structures or utilities occurring during the removal of trees.

**METHOD OF MEASUREMENT:**

This item shall be measured for payment by each tree removed. There will be no separate pay item for debris removal. This shall be considered incidental to tree removal. The removal of the stump shall be paid for under the Item #0201001 "Clearing and Grubbing."

**BASIS OF PAYMENT:**

Payment for the Removal of Trees shall be made based upon the successful removal of trees and debris at the locations called out in the contract documents or as directed by the City of Bristol.

<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
0201012A	Removal of Trees	EA

**ITEM 0201198A**

**REMOVE AND RELOCATE STONES**

**DESCRIPTION:**

The work covered under this item includes furnishing all labor and equipment to remove the ornamental stones for the construction of the sidewalk which are called out on the contract drawings or as directed by the City of Bristol Engineer. All the stones lie within the Right of Way (ROW) for Shrub Road or on neighboring Property of the City of Bristol. Some of the stones are larger ornamental stones at Seymore Park. Other stones are located as edging along the aprons of two driveways at #465 & #477 Shrub Road. There are other locations along the Shrub Road ROW as shown in the Contract Documents.

**CONSTRUCTION METHODS:**

The Contractor shall remove only those stones specified in the contract documents. Contractor to coordinate with the City of Bristol Engineer prior to any stone removal. The Contractor shall notify the Landowners of #465 & #477 Shrub Road prior to stone removal at their driveway aprons. If the landowner chooses to maintain ownership of the stones, then the Contractor shall remove and store them at a location on the property as directed by the Landowner.

Large Ornamental stones at Seymore park shall be removed and relocated to a location designated by the City of Bristol Engineer.

Any stones not wanted by City of Bristol or Landowners shall become property of the Contractor.

**METHOD OF MEASUREMENT:**

This item shall be measured as a lump sum for all stones removed including furnishing all labor, equipment, and incidentals to remove stones.

**BASIS OF PAYMENT:**

Payment for Removal of stones shall be made based upon a lump sum of stones remove as shown on Contract Documents or as directed by City of Bristol Engineer.

<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
0201198A	Remove and Relocate Stones	L.S.

## **ITEM 0201501A**

## **RELOCATION OF MAILBOX**

### **DESCRIPTION:**

The work covered under this item shall include furnishing all labor, material, equipment, and incidentals required to relocate those mailboxes that will need to be relocated to meet the new edge of the road. This includes the filling and regrading of the hole in the ground caused by the mailbox removal.

“The City of Bristol Mailbox Placement Guidance Detail” as shown on the contract documents, shall govern their installation or as approved by the City of Bristol Engineer. This shall also include any temporary relocation and use of temporary stands to move the mailboxes out of the way of construction if the permanent locations are not ready for the permanent installation.

### **CONSTRUCTION METHODS:**

- The Contractor shall remove only those Mailboxes called out on the construction documents.
- Position your mailbox 42" to 45" from the road surface to the bottom of the mailbox or point of mail entry.
- Place your mailbox 10" minimum back from the curb.
- Put your house or apartment number on the mailbox.

If your mailbox is on a different street from your house or apartment, put your full street address on the mailbox. The best mailbox supports are stable but bend or fall away if a car hits them. The Federal Highway Administration recommends:

- A 4" x 4" wooden support or a 2"-diameter standard steel or aluminum pipe.
- Avoid unyielding and potentially dangerous supports, like heavy metal pipes, concrete posts, and farm equipment (e.g., milk cans filled with concrete).
- Bury your post no more than 24" deep.

### **METHOD OF MEASUREMENT:**

This item shall be measured for each mailbox relocated which shall include furnishing all labor, equipment, and incidentals to relocate mailbox. This shall also include any temporary relocation and temporary stand that may be required to temporarily relocate the mailbox out of the construction zone before the final permanent relocation is ready.

BASIS OF PAYMENT:

Relocation of mailbox shall be made based upon each mailbox relocated to meet the new edge of road as shown on Contract Documents or as directed by City of Bristol Engineer.

<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
0201501A	Relocation of Mailbox	EA.

## **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:**

The inlet protection system shall be manufactured from a specially designed woven polypropylene geotextile sewn by a double needle machine, using a high strength nylon thread. The inlet protection system shall be manufactured by one of the following or an approved equal:

#### Silt Sack®

TerraFixGeo

2831 Cardwell Road Richmond, VA 23234

Phone: 416-674-0363

E-mail: [info@terrafixgeo.com](mailto:info@terrafixgeo.com)

Website: <http://terrafixgeo.com/products/siltsack/>

#### Dandy Sack®

Dandy Products Inc.

P.O. Box 1980

Westerville, Ohio 43086

Phone: 800-591-2284

Fax: 740-881-2791

E-mail: [dlc@dandyproducts.com](mailto:dlc@dandyproducts.com)

Website: [www.dandyproducts.com](http://www.dandyproducts.com)

#### FleXstorm Catch-It: Temporary Inlet Protection

ADS Flexstorm

24137 W. 111th St - Unit A

Naperville, IL 60564

Telephone: (866) 287-8655

Fax: (630) 355-3477

E-mail: [info@inletfilters.com](mailto:info@inletfilters.com)

<https://www.inletfilters.com/>

The inlet protection system shall be manufactured to fit the opening of the catch basin or drop inlet. Sack shall have the following features: two dump straps attached at the bottom to facilitate the emptying of sack and lifting loops as an integral part of the system to be used to lift sack from the basin. The inlet protection system 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 inlet protection system shall

be emptied, cleaned and placed back into the basin. Sediment shall be properly disposed of by the contractor per CTDOT standards.

**Construction Methods:**

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

**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, removal of sediment, materials, equipment, tools, and labor incidental thereto.

Pay Item	Pay Unit
Sediment Control System at Catch Basin	each.

## **ITEM #0601651A - RETAINING WALL SITE NO. 1**

**Description:** This item shall consist of furnishing and constructing a retaining wall located on the property at 3 Stevens Street between Station 83+36.14 and Station 84+05.33 right on Jerome Avenue. The retaining wall shall be built out of the stones removed from the existing stone retaining wall on the same property. The removal of the existing stone retaining wall shall be paid for under Item #0974005 "Removal of Existing Retaining Wall". This item shall also include all the incidentals necessary to complete the work in the location, at the grades, and to the dimensions and details shown on the Plans.

### **Materials:**

1. The stone shall consist of those in the present wall removed and its foundation and such new stones as may be required.
2. Mortar shall be Class PCC03360 and meet the applicable requirements of M.03: "Portland and Hydraulic Cement Concrete".

### **Construction Methods:**

1. All the stones from the present walls to be rebuilt, shall be removed and used to rebuild the new walls in addition to furnishing such new stones as may be necessary to provide rebuilt walls of uniform appearance and cross-sectional dimensions throughout their length.
2. The stones shall be laid so as to break joints and in full mortar beds. All vertical spaces shall be flushed with cement mortar and shall be packed full with spalls. No spalls shall be allowed in the beds – except if the bed requires more than 1 in. of mortar. At least 25% of the stones in the face shall be headers evenly distributed throughout the walls. Weep holes shall be constructed as directed.

**Method of Measurement:** This work, being paid for on a lump sum basis, will not be measured for payment. Prior to the commencement of work on this item, the Contractor shall submit a proposed schedule of values for review and comment by the Engineer.

**Basis of Payment:** This work shall be paid for at the Contract lump sum price for "Retaining Wall Site No. 1," complete in place, which price shall include all work shown within the pay limits on the Plans for the retaining wall including the following:

1. Design and construction of the retaining wall.
  2. Excavation required for the construction of the retaining wall.
  3. Any other work and materials shown on the Plans for the retaining wall.
- The price shall also include all materials, equipment, tools, and labor incidental thereto.

Bedrock or boulders in excess of one (1) cubic yard encountered in the excavation, shall be paid for under the item "Structure Excavation - Rock."

Pay Item	Pay Unit
Retaining Wall Site No. 1	1.s.

## **ITEM #0601652A - RETAINING WALL (SITE NO. 2)**

**Description:** This item will consist of designing, furnishing and constructing a retaining wall in the location, grades, and to the dimensions and details shown on the contract drawings, and in accordance with these specifications.

**Retaining Wall Selection:** The wall chosen shall be selected from the list shown on the contract drawings. The contract drawings may detail a cast-in-place reinforced concrete retaining wall. This type of retaining wall may also be used as an option. The Engineer will reject any proposed retaining wall that is not listed on the contract drawings.

The list on the contract drawings is for all proprietary retaining walls that are appropriate for each site. This list does not warrant that the walls can be designed to meet either the dimensional, structural, or geotechnical constraints at each site.

The following is a list of the Department's current approved proprietary retaining walls, no other proprietary retaining walls will be allowed

**Design:** Design computations are not required for the cast-in-place wall detailed on the contract drawings except for any temporary earth retaining systems included in the lump sum item. The Contractor shall submit working drawings and design computations for temporary earth retaining systems in accordance with Article 7.14.03.

1 - Design Computations: If the Contractor chooses one of the proprietary wall options, he is fully responsible for the design, detailing and additional specifications required. The actual designer of the retaining wall shall be a qualified Professional Engineer licensed in the State of Connecticut. The designer must have designed at least three proprietary walls within the last three years.

2 - Designer's Liability Insurance: The Designer of the proprietary retaining wall shall secure and maintain at no direct cost to the Department, a Professional Liability Insurance Policy for errors and omissions in the minimum amount of One Million Dollars (\$1,000,000). The Designer may, at his election, obtain a policy containing a maximum Two Hundred Fifty Thousand Dollars (\$250,000) deductible clause, but if he should obtain a policy containing such a clause, the Designer shall be liable to the extent of the deductible amount. The Designer shall obtain the appropriate and proper endorsement to its Professional Liability Policy to cover the indemnification clause in this contract as the same relates to negligent acts, errors or omissions in the work performed by the Designer. The Designer shall continue this liability insurance coverage for a period of three years from the date of the acceptance of the work by the agency head as evidenced by a certificate of acceptance issued to the contractor or for three years after the termination of the contract, whichever is earlier, subject to the continued commercial availability of such insurance.

The Designer shall supply the certificate of this insurance to the Engineer prior to the start of construction of the wall. The designer's insurance company shall be licensed in the State of Connecticut.

3 - Preliminary Submissions for Proprietary Retaining Walls: Prior to the start of fabrication or construction, the Contractor shall submit to the Engineer a design package, which shall include, but not be limited to the following:

a. Detailed Plans:

- Plan sheets shall be approximately 24" x 36".
- Stamped by a licensed Professional Engineer (Connecticut).
- Full plan view of the wall drawn to scale. The plan view must reflect the horizontal alignment and offset from the horizontal control line to the face of the wall. Beginning and ending stations, all utilities, signs, lights, etc. that affect the construction along with all property lines and easement lines adjacent to the wall shall be shown.
- Full elevation view of the wall drawn to scale. Elevation views should indicate the elevation at the top and bottom of walls, horizontal and vertical break points, and the location of finished grade.
- Typical cross sections drawn to scale including all appurtenances. Detailed cross section should be provided at significant reinforcement transitions such as wall ends.
- Details of all wall components and their connections such as the length, size and type of reinforcement and where any changes occur; modular component and facing details including reinforcing steel and reinforcement connections; joint material including geotextile filter location and horizontal joint compression material, etc.
- Drainage details for embankment backfill including attachment to outlets shown on contract drawings.
- Details of any roadway drainage pipe projecting through the wall, or any attachments to the wall. Details of the treatment of drainage swales or ditches shown on the contract drawings.
- Design parameters used along with AASHTO references.
- Material designations for all materials to be used.

- Detailed construction methods including a quality control plan. Construction quality control plans should include monitoring and testing frequencies (e.g, for setting batter and maintaining horizontal and vertical control). Construction restraints should also be listed in the details. Specific requirements for construction around obstructions should be included.
- Details of parapet attachments where required along with any lighting and/or signing requirements.
- Details of Architectural Treatment where required.
- Details of Temporary Earth Retaining Systems where required.
- Details of wall treatment where the wall abuts other structures.
- Treatment at underground utilities where required.

b. Design Computations:

- Stamped by a licensed Professional Engineer (Connecticut).
- Computations shall clearly refer to the applicable AASHTO provisions as stated in the Notes on the Contract Drawings.
- Documentation of computer programs including all design parameters.
- The design shall conform to the criteria listed below.

c. Construction Specifications:

- Construction methods specific to the proprietary retaining wall chosen. These specifications should include construction limitations including vertical clearance, right-of-way limits, etc. Submittal requirements for materials such as certification, quality, and acceptance/rejection criteria should be included. Details on connection of modular units and connection of reinforcements such that assurance of uniform stress transfer should be included.
- Any requirements not stated herein.

The submissions for proprietary retaining walls shall be treated as working drawings in accordance with Section 1.05 amended as follows:

a. 6 sets of each submission shall be supplied to the Department

b. The Contractor shall allow 21 days for the review of each submission. If subsequent submissions are required as a result of the review process, 21 days shall be allowed for review of each submission. No extensions in contract time will be allowed for the review of these submissions.

#### 4 – General Design Requirements

a. All designs for proprietary walls and temporary earth retaining systems (if required) shall conform to the latest edition of the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges including the latest Interims published except as noted otherwise herein.

b. The wall design shall follow the dimensions of the wall envelope shown in the contract drawings.

For all proprietary walls, the top of the leveling pad or reinforced concrete toe footing shall be located at or below the bottom of the footing elevation shown on the contract drawings. If no footing elevation is shown, the minimum wall embedment shall be four feet as measured to the top of the leveling pad or toe footing.

If steps at the bottom of the wall are required, they shall be kept at or below the footing elevation shown on the contract drawings. Steps in addition to those shown on the contract drawings will be permitted at no additional cost to the Department.

c. The wall shall be designed to be within all property lines and easement lines shown on the contract drawings. If additional work areas are necessary for the construction of the proprietary retaining wall, the Contractor shall be responsible for obtaining the rights from the affected property owners. Copies of these rights shall be forwarded to the Department.

d. The top of the wall shall be at the top of the wall elevations shown on the contract drawings. Where coping or barrier is utilized, the wall face panel shall extend up into the coping or barrier a minimum of two inches. The top of the face panels may be level or sloped to meet the top of the wall line noted.

e. The wall shall be designed for a minimum live load surcharge equal to two feet of soil at a unit weight of 125 pounds per cubic foot. If there are specific live load surcharges acting on the wall, they shall also be accounted for. The minimum equivalent fluid pressure used to design the wall shall be 33 pounds per cubic foot per linear foot of wall.

f. If stated on the contract drawings, the wall shall be designed for seismic forces according to the AASHTO Specifications.

g. If the wall is detailed with a concrete parapet, the top two courses of prefabricated modular walls units shall be designed to support a transverse railing load of 10 kips. The 10 kip

load may be distributed over the length of the parapet section between joints, but not exceeding 20 feet. Computations that verify the stability of the top two courses of the modular units shall be submitted to the Engineer.

The detailing and reinforcement in the parapet section above the gutterline or finished grade, including any light standard attachments, shall be as shown on the contract drawings.

h. The wall shall be designed to accommodate all roadway drainage and drainage structures as shown on the contract drawings.

i. The maximum allowable bearing pressure of the soil shall be as shown on the contract drawings. The bearing pressure stated assumes a uniform pressure distribution. If additional soils information is required by the Contractor's designer, it must be obtained by the Contractor and will not be reimbursed by the Department.

#### 6 - Design Requirements for Cast-in-place Walls

a. Hydrostatic Forces: Unless specified otherwise, when a design high water surface is shown on the contract drawings at the face of the wall, the design stresses calculated from that elevation to the bottom of wall must include a three foot minimum differential head of saturated backfill. In addition, the buoyant weight of saturated soil shall be used in the calculation of pullout resistance.

b. Backfill: The friction angle of the pervious structure backfill used in the reinforced fill zone for the internal stability design of the wall shall be assumed to be 34 degrees unless shown otherwise on the contract drawings. The friction angle of the in-situ soils shall be assumed to be a maximum of 30 degrees unless otherwise shown on the Contract drawings.

#### **Materials:**

1 - Cast-in Place Concrete Walls: The materials furnished and used in the work shall be those prescribed within the Standard Specifications for Roads, Bridges and Incidental Construction, including supplemental specifications and applicable special provisions.

#### **Construction Methods:**

1 - Cast-in-Place Concrete Walls: All construction methods for cast-in-place retaining walls shall be in accordance with the detailed requirements prescribed for the construction the appropriate items as specified in the Standard Specifications for Roads, Bridges, and Incidental Construction.

f. Backfilling:

T-Wall and Cast – in – place Walls:

Backfill placement shall closely follow erection of each course of modules. Backfill shall be placed in such a manner as to avoid any damage or disturbance to the wall materials or misalignment of the modules. Any wall materials which become damaged or disturbed during backfill placement shall be either removed and replaced at the Contractor's expense or corrected, as directed by the Engineer. Any backfill material placed within the wall envelope which does not meet the requirements of this specification shall be corrected or removed and replaced at the Contractor's expense.

Backfill shall be compacted to 95 percent of the maximum density as determined by AASHTO T-99, Method C or D (with oversize correction, as outlined in Note 7).

The moisture content of the backfill material prior to and during compaction shall be uniform throughout each layer. Backfill material shall have a placement moisture content less than or equal to the optimum moisture content. Backfill material with a placement moisture content in excess of the optimum moisture content shall be removed and reworked until the moisture content is uniform and acceptable throughout the entire lift. The optimum moisture content shall be determined in accordance with AASHTO T-99, Method C or D (with oversize correction, as outlined in Note 7).

If 30 percent or more of the backfill material is greater than 3/4 inch in size, AASHTO T-99 is not applicable. For such a material, the acceptance criterion for control of compaction shall be either a minimum of 70 percent of the relative density of the material as determined by a method specification provided by the wall supplier, based on a test compaction section, which defines the type of equipment, lift thickness, number of passes of the specified equipment, and placement moisture content.

The maximum lift thickness after compaction shall not exceed ten inches. The Contractor shall decrease this lift thickness, if necessary, to obtain the specified density.

Compaction within three feet of the face of the modules shall be achieved by at least three passes of a lightweight mechanical tamper, roller or vibratory system. The specified lift thickness shall be adjusted as warranted by the type of compaction equipment actually used. Care shall be exercised in the compaction process to avoid misalignment or damage to the module. Heavy compaction equipment shall not be used to compact backfill within three feet of the wall face.

At the end of each day's operation, the Contractor shall slope the last level of backfill away from the wall facing to direct runoff of rainwater away from the wall face. The Contractor shall control and divert runoff at the ends of the wall such that erosion or washout of the wall section does not occur. In addition, the Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

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

**Basis of Payment:** This work will be paid for at the contract lump sum for “Retaining Wall (Site No.   )”, complete in place, which price shall include all work shown within the pay limits shown on the contract drawings for the retaining wall including but not limited to the following:

1. Design and construction of the proprietary retaining wall.
2. Excavation required for the construction of the retaining wall.
3. Design and construction of temporary earth retaining systems to retain the existing facilities during construction.
4. The furnishing, placing and compacting of pervious structure backfill within the payment lines.
5. The furnishing and placing of backfill drainage systems for the wall.
6. The furnishing and placing of rigid metal conduit, junction boxes, light standard anchorages, and other electrical appurtenances located within the wall proper.
7. Services of the On-Site Representative.
8. Any other work and materials shown on the plans for the retaining wall.

The price shall also include all materials, equipment, tools and labor incidental thereto.

If bedrock or boulders in excess of one cubic yard are encountered in the excavation, it shall be paid for under the item "Structure Excavation - Rock".

<u>Pay Item</u>	<u>Pay Unit</u>
Retaining Wall (Site No. <u>  </u> )	LS

### **ITEM #0601653A - RETAINING WALL (SITE NO. 3)**

**Description:** This item shall consist of conducting subsurface investigation, designing, furnishing and constructing a retaining wall and all incidentals necessary to complete the work in the location, at the grades, and to the dimensions and details shown on the Plans.

Retaining Wall Selection: The retaining wall type shall be a proprietary block wall retaining system. Generic Standard Concrete Type Blocks are unacceptable material to be used. The Contractor shall submit shop drawing and structure wall calculations signed and stamped by a CT licensed Structural Engineer and a Geotechnical Engineer for approval by the Project Engineer, the City of Bristol Public Works Director and City of Bristol City Engineer.

**NOTE: SEE THE PLANS FOR THE SPECIFIC RETAINING WALL TYPES THAT ARE ACCEPTABLE FOR THE SITE.**

On-Site Representative: A qualified and experienced representative from the retaining wall supplier shall be at the Site at the initiation of wall construction to assist the Contractor and the Project Engineer and the City of Bristol Public Works Director and City Engineer at no additional cost to the City of Bristol. The wall supplier's on-Site representative shall have, in the past three years, successfully installed at least three retaining walls of the height, length and complexity similar to the retaining wall(s) shown on the Plans and meeting the tolerances specified herein. After the initial wall construction, the representative shall also be available on an as needed basis, as requested by the Project Engineer and the City of Bristol Public Works Director and City Engineer.

Pre-Installation Meeting: A Pre-Installation meeting shall be scheduled prior to commencement of construction activity. Attendees shall include the Engineer, the Contractor (including wall construction crew chiefs), the wall Subcontractor, wall manufacturer and wall designer, or their respective representatives. No wall construction activity shall be performed until the Contractor's final submittal has been accepted by the Project Engineer and the City of Bristol Public Works Director and City Engineer and the Pre-Installation meeting has been held.

Design: The submissions for proprietary retaining walls shall be treated as Working Drawings in accordance with Section 1.05.02.

1. Design Computations: If the Contractor chooses one of the proprietary wall options, he is fully responsible for the design, detailing and additional specifications required. The actual designer of the retaining wall shall be a qualified Professional Engineer licensed in the State of Connecticut. The designer must have designed at least three proprietary walls within the last three years.
2. Designer's Liability Insurance: The Designer of the proprietary retaining wall shall secure and maintain, at no direct cost to the City of Bristol, a Professional Liability Insurance Policy for errors and omissions in accordance with Articles 1.03.07 and 1.05.02.
3. Preliminary Submissions for Proprietary Retaining Walls: Prior to the start of fabrication or construction, the Contractor shall submit Working Drawings to the Project Engineer and the

City of Bristol Public Works Director and City Engineer, which shall include, at a minimum, the following:

a. Detailed Plans:

- 1) Full plan view of the wall drawn to scale. The plan view must reflect the horizontal alignment and offset from the horizontal control line to the face of the wall. Beginning and ending stations, all utilities, signs, lights, etc. that affect the construction along with all property lines and easement lines adjacent to the retaining wall shall be shown.
- 2) Full elevation view of the wall drawn to scale. Elevation views shall indicate the elevation at the top and bottom of walls, horizontal and vertical break points, and the location of finished grade.
- 3) Typical cross sections drawn to scale including all appurtenances. Detailed cross sections shall be provided at significant reinforcement transitions such as wall ends.
- 4) Details of all wall components and their connections such as the length, size and type of reinforcement and where any changes occur; modular component and facing details including reinforcing steel and reinforcement connections; joint material including geotextile filter location and horizontal joint compression material, etc.
- 5) Drainage details for embankment backfill including attachment to outlets shown on Plans.
- 6) Details of any roadway drainage pipe projecting through the wall, or any attachments to the wall. Details of the treatment of drainage swales or ditches shown on the Plans.
- 7) Design parameters used along with references from latest edition of American Association of State Highway and Transportation Officials (AASHTO) LRFD Bridge Design Specifications, including the latest interims, as specified in the Plans.
- 8) Material designations for all materials to be used.
- 9) Detailed construction methods including a Quality Control plan. Construction Quality Control plans shall include monitoring and testing frequencies (e.g., for setting batter and maintaining horizontal and vertical control), construction restraints, and specific requirements for construction around obstructions.
- 10) Details of parapet attachments where required, along with any lighting and/or signing requirements.
- 11) Details of architectural treatment where required.
- 12) Details of TERS where required if the retained height is 5ft or higher.
- 13) Details of retaining wall treatment where the wall abuts other structures.
- 14) Treatment at underground utilities where required.

b. Design Computations:

- 1) Computations shall clearly refer to the applicable AASHTO LRFD Bridge Design Specifications provisions as stated on the Plans.
- 2) Documentation of computer programs including all design parameters.
- 3) The design shall meet the criteria listed below.

- c. Construction Specifications:
  - 1) Construction methods shall be specific to the chosen proprietary retaining wall. These specifications shall include construction limitations including vertical clearance, right-of-way limits, etc.
  - 2) Submittal requirements for materials such as certification, quality, and acceptance/rejection criteria.
  - 3) Details on connection of modular units and connection of reinforcements including assurance of uniform stress transfer.
  - 4) Any other requirements.
- 4. Final Submissions for Proprietary Retaining Walls: Once a proprietary retaining wall design has been reviewed and accepted by the Project Engineer and the City of Bristol Public Works Director and City Engineer, the Contractor shall submit Working Drawings in accordance with Article 1.05.02.

The Working Drawing submission shall be made no later than 14 days after acceptance by the Project Engineer and the City of Bristol Public Works Director and City Engineer. No work shall be performed on the retaining wall until the Department has accepted the Working Drawings.

Acceptance of the Working Drawings shall not relieve the Contractor of responsibility for the successful completion of the work.

The Contractor's designer of the proprietary retaining wall shall review any Shop Drawings prepared for the fabrication of the wall. One set of full-size accepted Shop Drawings shall be submitted per Article 1.05.02 Submittals.
- 5. General Design Requirements:
  - a. All designs for proprietary walls and TERS (if required) shall meet the requirements of the latest edition of the AASHTO LRFD Bridge Design Specifications including the latest Interims published except as noted otherwise herein.
  - b. The wall design shall follow the dimensions of the wall envelope shown on the Plans.
  - c. The top of the wall shall be at the top of the wall elevations shown on the Plans. Where coping or barrier is used, the wall face panel shall extend up into the coping or barrier a minimum of 2 inches. The top of the face panels may be level or sloped to meet the top of the wall line noted.
  - c. Cast-in-place concrete will not be acceptable
  - d. If stated on the Plans, the retaining wall shall be designed for seismic forces according to the AASHTO LRFD Bridge Design Specifications.
  - i. The wall shall be designed to accommodate all roadway drainage and drainage structures as shown on the Plans.
  - j. The contractor is responsible for engaging a Geotechnical Engineer to perform soil subsurface explorations, obtain the geotechnical soil design parameters for the retaining wall design and prepare a signed and sealed Geotechnical Report.
  - k. At a minimum, an underdrain system shall be provided for leading subsurface and surface water away from the backfill and outside limits of the wall.
  - l. Hydrostatic Forces: Unless specified otherwise, when a design high water surface is shown on the Plans at the face of the wall, the design stresses calculated from that

- elevation to the bottom of wall must include a 3-foot minimum differential head of saturated backfill. In addition, the buoyant weight of saturated soil shall be used in the calculation of pullout resistance.
- m. The Maximum Design Foundation Pressures for both Strength and Service Limit States shall be as shown on the Plans. The foundation pressure stated assumes a uniform pressure distribution. If additional soils information is required by the Contractor's designer, it must be obtained by the Contractor at no additional cost to the City of Bristol.
  - n. Backfill: The friction angle of the Pervious Structure Backfill used in the reinforced fill zone for the internal stability design of the wall shall be assumed to be 34 degrees unless shown otherwise on the Plans. The friction angle of the in-situ soils shall be assumed to be a maximum of 30 degrees unless otherwise shown on the Plans.
  - o. Design Requirements for Prefabricated Modular Walls: The general design of the retaining wall shall be according to the AASHTO LRFD Bridge Design Specifications. The Contractor shall be responsible for internal stability aspects of wall design. The design shall consider the stability at each level of module. The global stability of the structure, including slope stability, bearing capacity at strength and service limit states, and total and differential settlement, is the responsibility of the Department.
    - a. Infill: The maximum assumed unit weight of infill material used for overturning stability analysis shall be 100 pounds per cubic foot. If Doublewal modules are to be filled with crushed stone, the maximum assumed unit weight of the infill shall be 80 pounds per cubic foot.
    - b. Resistance Factors: The resistance factors used in the design computations shall be as specified in the AASHTO LRFD Bridge Design Specifications amended as follows: The unfactored resistance for pullout of the concrete stem for T-Walls shall be 1.5 times or greater than the unfactored loads. Shear keys shall not be included in these computations. Only resisting forces developed beyond the theoretical failure plane may be used in these computations.

### **Materials:**

1. Prefabricated Modular and Mechanically Stabilized Earth Walls: Materials shall meet the following requirements, and those not listed below shall be as prescribed within the Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, including supplemental specifications and applicable special provisions.
  - a. Concrete: The concrete shall meet the requirements of Section M.03 and as follows:
    - Concrete for all precast components shall be air-entrained, Portland cement, fine and coarse aggregates, admixtures and water. An air-entraining Portland cement or an accepted air-entraining admixture shall be used. The entrained-air content shall be from 4% to 7%. The concrete shall attain a minimum 28-day strength ( $f'_c$ ) of 4,500 pounds per square inch. The mix design shall be furnished to the Engineer.
    - Concrete for footings or unreinforced leveling pads shall meet the requirements of Class PCC03340 Concrete. Class PCC04460 Concrete shall be used for cast-in-place concrete copings.
    - Special Surface Treatment: If a special surface finish is proposed, before proceeding with production, a model face panel shall be provided by the fabricator for the Engineer's

acceptance, to establish a guide and standard for the type of finish on the exposed face. This panel shall be stored at the fabricator's plant to be used for comparison purposes during production. Formed surfaces other than the exposed face shall not require a special finish.

Acceptance Criteria for Precast Components: Acceptance of precast components shall be based on the concrete strength, the soil reinforcement connection devices and the panel or module dimensions meeting the manufacturer's allowable tolerances. Any chipping, cracks, honeycomb or other defects shall be within acceptable standards for precast concrete or repaired as determined by the Engineer.

It is recognized that certain cracks and surface defects are not detrimental to the structural integrity of the precast components if properly repaired. The Engineer will determine the need for, and review the proposed method of, such repair, and all repairs shall be reviewed by the Engineer prior to acceptance for use in wall construction.

Marking: The date of manufacture, production lot number, and piece-mark shall be clearly marked on the non-exposed side of each element.

- b. Reinforcing Steel: Reinforcing steel shall meet the requirements of ASTM A615, Grade 60. All reinforcing bars shall be hot-dip galvanized, after fabrication, to the requirements of ASTM A767, Class 1, including supplemental requirements.
- c. Attachment Devices for Prefabricated Modular Walls: All structural connectors shall be hot-dip galvanized according to the requirements of ASTM A123 (AASHTO M111). The minimum thickness of the galvanizing shall be based on the service life requirements in the AASHTO LRFD Bridge Design Specifications.
- d. Soil Reinforcing and Attachment Devices for MSE Walls:
  - 1) Soil Reinforcement: Steel strip reinforcement bands shall be hot rolled to the required shape and dimensions. The steel shall meet the requirements of ASTM A572 Grade 65 unless otherwise specified.

Welded wire fabric reinforcement shall be shop fabricated from cold-drawn wire of the sizes and spacing shown on the Plans. All wire and welded wire fabric shall meet the requirements of ASTM A1064 or AASHTO M 336M/M 336. Welded wire fabric shall be galvanized in accordance with the requirements of AASHTO M 111 or ASTM A123.

All soil reinforcement and structural connectors shall be hot-dip galvanized in accordance with ASTM A123 (AASHTO M111). The minimum thickness of the galvanizing shall be based on the service life requirements as previously stated.
  - 2) Connection Hardware: Connection hardware shall be in accordance with the details on the Plans, and shall meet the requirements in the special provisions or Plans. All fasteners shall be galvanized in accordance with ASTM A153 or AASHTO M 232 and shall meet the requirements of AASHTO M 164. The minimum thickness of the galvanizing shall be based on the service life requirements as previously stated.
- e. Joint Materials: All horizontal and vertical joints between panels shall be covered by Geotextile (Separation - Class 1) meeting the requirements of Subarticle M.08.01-19. The minimum width and lap shall be 12 inches. Details of installation including connection of the geotextile to coping shall be provided.

- f. Backfill: Backfill shall be Pervious Structure Backfill meeting the requirements of Articles M.02.05 and M.02.06. In addition, the backfill for Mechanically Stabilized Earth Walls shall meet all of the following electrochemical requirements:

PROPERTY	REQUIREMENT	TEST METHODS
Resistivity at 100% saturation	Minimum 3000 ohm-cm	ASTM G57-06 (2012) AASHTO T288
pH	Acceptable Range 5.0 – 10.0	ASTM G51-95 (2012) AASHTO T289
Chlorides	Maximum 100 ppm	ASTM D512 or D4327 AASHTO T291
Sulfates	Maximum 200 ppm	ASTM D516 or D4327 AASHTO T290
Organic Content	Maximum 1%	ASTM D2974 or AASHTO T267

- g. Smooth Steel dowels: Steel dowels used in parapet joints, shall meet the requirements of ASTM A36 and shall be galvanized in accordance with ASTM A153.

### Construction Methods:

1. Prefabricated Modular Walls: All construction methods for prefabricated modular retaining walls shall be in accordance with the detailed requirements prescribed for the construction of the appropriate component items as specified in the Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, with the following additional requirements:
  - a. Inspection and Rejection: The quality of materials, process of manufacture, and finished units will be subject to inspection by the Engineer prior to shipment.
 

Modular units which have imperfect molding, honeycomb, open texture concrete, or broken corners shall be repaired to the satisfaction of the Engineer or will be rejected. Insufficient compressive strength will also be cause for rejection.

Modular units with special surface treatments will be rejected if there are variations in the exposed face that deviate from the accepted model as to color or texture in accordance with precast concrete industry standards.
  - b. Installation: The modular units shall be installed in accordance with manufacturer's recommendations. Special care shall be taken in setting the bottom course of units to true line and grade.
 

The vertical joint opening on the front face of the wall shall not exceed 3/4 inch. Vertical tolerances and horizontal alignment of the wall shall not exceed 3/4 inch in 8 feet from the vertical. The plumbness of the wall from top to bottom shall not exceed 1/2 inch per 8 feet, or 1 inch total, whichever is less, measured from the face line shown on the Plans. A strip of geotextile shall be installed at all vertical joints.

Assembly of the various components shall not place any undue strain or stress on any of the members that constitute the completed structure.
  - c. Backfilling:
    - 1) Doublewal:

- Infill for modular units shall be placed one course at a time, in lifts not exceeding two feet in thickness. The dry density of each lift of Pervious Structure Backfill, after compaction, shall meet the requirements of Article 2.16.03.
- Placement of the Pervious Structure Backfill behind the wall shall follow erection of successive courses of modular units. The difference in backfill elevation between the interior and exterior of the wall shall not exceed 6 feet.
- The units may be backfilled with crushed stone if the design of the retaining wall was based on a density of 80 pounds per cubic foot.
- All Pervious Structure Backfill placed outside of the modular units shall be placed in accordance with the requirements of Article 2.16.03.
- At the end of each work shift, the Contractor shall slope the last level of backfill away from the wall facing to direct runoff away from the wall face. The Contractor shall control and divert runoff at the ends of the wall to prevent erosion. In addition, the Contractor shall prevent surface runoff from entering the wall construction site.

**Method of Measurement:** This work, being paid for on a lump sum basis, will not be measured for payment. Prior to the commencement of work on this item, the Contractor shall submit a proposed schedule of values for review and comment by the Engineer.

**Basis of Payment:** This work will be paid for at the Contract lump sum price for “Retaining Wall Site No. 2,” complete in place, which price shall include all work shown within the pay limits on the Plans for the retaining wall including the following:

1. Subsurface investigation
2. Design and construction of the proprietary retaining wall.
3. Excavation required for the construction of the retaining wall.
4. Design and construction of temporary earth retaining systems to retain the existing facilities during construction.
5. The furnishing, placing and compacting of the Pervious Structure Backfill within the payment lines.
6. The furnishing and placing of backfill drainage systems for the wall.
7. The furnishing and placing of rigid metal conduit, junction boxes, light standard anchorages, and other electrical appurtenances located within the wall properly.
8. Services of the On-Site Representative.
9. Any other work and materials shown on the Plans for the retaining wall.

The price shall also include all materials, equipment, tools and labor incidental thereto.

Bedrock or boulders in excess of 1 cubic yard encountered in the excavation, will be paid for under the item "Structure Excavation - Rock."

Pay Item	Pay Unit
Retaining Wall Site No. 3	l.s.

**ITEM #0601654A - RETAINING WALL (SITE NO. 4)**

**Description:** This item will consist of designing, furnishing and constructing a retaining wall in the location, grades, and to the dimensions and details shown on the contract drawings, and in accordance with these specifications.

**Retaining Wall Selection:** The wall chosen shall be selected from the list shown on the contract drawings. The contract drawings may detail a cast-in-place reinforced concrete retaining wall. This type of retaining wall may also be used as an option. The Engineer will reject any proposed retaining wall that is not listed on the contract drawings.

The list on the contract drawings is for all proprietary retaining walls that are appropriate for each site. This list does not warrant that the walls can be designed to meet either the dimensional, structural, or geotechnical constraints at each site.

The following is a list of the Department's current approved proprietary retaining walls, no other proprietary retaining walls will be allowed:

**NOTE: SEE THE CONTRACT DRAWINGS FOR THE SPECIFIC WALLS THAT ARE ACCEPTABLE FOR EACH SITE.**

Prefabricated Modular Walls

1. Doublewal-Standard Module  
Doublewal  
173 Church Street  
Yalesville, CT 06492  
(203) 269-3119

2. T-Wall Retaining Wall System  
The Neel Company  
8328-D Traford Lane  
Springfield, VA 22152  
(703) 913-7858

Mechanically Stabilized Earth (MSE) Walls

1. Reinforced Earth Walls  
The Reinforced Earth Company  
133 Park Street  
North Reading, MA 01864  
(978) 664-2830

2. Retained Earth  
The Reinforced Earth Company  
1372 Oldbridge Road, Suite 101  
Woodbridge, VA 22192  
(703) 499-9818

**Design:** Design computations are not required for the cast-in-place wall detailed on the contract drawings except for any temporary earth retaining systems included in the lump sum item. The Contractor shall submit working drawings and design computations for temporary earth retaining systems in accordance with Article 7.14.03.

1 - Design Computations: If the Contractor chooses one of the proprietary wall options, he is fully responsible for the design, detailing and additional specifications required. The actual designer of the retaining wall shall be a qualified Professional Engineer licensed in the State of Connecticut. The designer must have designed at least three proprietary walls within the last three years.

2 - Designer's Liability Insurance: The Designer of the proprietary retaining wall shall secure and maintain at no direct cost to the Department, a Professional Liability Insurance Policy for errors and omissions in the minimum amount of One Million Dollars (\$1,000,000). The Designer may, at his election, obtain a policy containing a maximum Two Hundred Fifty Thousand Dollars (\$250,000) deductible clause, but if he should obtain a policy containing such a clause, the Designer shall be liable to the extent of the deductible amount. The Designer shall obtain the appropriate and proper endorsement to its Professional Liability Policy to cover the indemnification clause in this contract as the same relates to negligent acts, errors or omissions in the work performed by the Designer. The Designer shall continue this liability insurance coverage for a period of three years from the date of the acceptance of the work by the agency head as evidenced by a certificate of acceptance issued to the contractor or for three years after the termination of the contract, whichever is earlier, subject to the continued commercial availability of such insurance.

The Designer shall supply the certificate of this insurance to the Engineer prior to the start of construction of the wall. The designer's insurance company shall be licensed in the State of Connecticut.

3 - Preliminary Submissions for Proprietary Retaining Walls: Prior to the start of fabrication or construction, the Contractor shall submit to the Engineer a design package, which shall include, but not be limited to the following:

a. Detailed Plans:

- Plan sheets shall be approximately 24" x 36".
- Stamped by a licensed Professional Engineer (Connecticut).
- Full plan view of the wall drawn to scale. The plan view must reflect the horizontal alignment and offset from the horizontal control line to the face of the wall. Beginning and ending stations, all utilities, signs, lights, etc. that affect the construction along with all property lines and easement lines adjacent to the wall shall be shown.
- Full elevation view of the wall drawn to scale. Elevation views should indicate the elevation at the top and bottom of walls, horizontal and vertical break points, and the location of finished grade.

- Typical cross sections drawn to scale including all appurtenances. Detailed cross section should be provided at significant reinforcement transitions such as wall ends.
- Details of all wall components and their connections such as the length, size and type of reinforcement and where any changes occur; modular component and facing details including reinforcing steel and reinforcement connections; joint material including geotextile filter location and horizontal joint compression material, etc.
- Drainage details for embankment backfill including attachment to outlets shown on contract drawings.
- Details of any roadway drainage pipe projecting through the wall, or any attachments to the wall. Details of the treatment of drainage swales or ditches shown on the contract drawings.
- Design parameters used along with AASHTO references.
- Material designations for all materials to be used.
- Detailed construction methods including a quality control plan. Construction quality control plans should include monitoring and testing frequencies (e.g, for setting batter and maintaining horizontal and vertical control). Construction restraints should also be listed in the details. Specific requirements for construction around obstructions should be included.
- Details of parapet attachments where required along with any lighting and/or signing requirements.
- Details of Architectural Treatment where required.
- Details of Temporary Earth Retaining Systems where required.
- Details of wall treatment where the wall abuts other structures.
- Treatment at underground utilities where required.

b. Design Computations:

- Stamped by a licensed Professional Engineer (Connecticut).

- Computations shall clearly refer to the applicable AASHTO provisions as stated in the Notes on the Contract Drawings.
- Documentation of computer programs including all design parameters.
- The design shall conform to the criteria listed below.

c. Construction Specifications:

- Construction methods specific to the proprietary retaining wall chosen. These specifications should include construction limitations including vertical clearance, right-of-way limits, etc. Submittal requirements for materials such as certification, quality, and acceptance/rejection criteria should be included. Details on connection of modular units and connection of reinforcements such that assurance of uniform stress transfer should be included.
- Any requirements not stated herein.

The submissions for proprietary retaining walls shall be treated as working drawings in accordance with Section 1.05 amended as follows:

- a. 6 sets of each submission shall be supplied to the Department
- b. The Contractor shall allow 21 days for the review of each submission. If subsequent submissions are required as a result of the review process, 21 days shall be allowed for review of each submission. No extensions in contract time will be allowed for the review of these submissions.

4 - Final Submissions for Proprietary Retaining Walls:

Once a proprietary retaining wall design has been reviewed and accepted by the Department, the Contractor shall submit the final plans. The final submission shall include one set of full size (approximately 24" x 36") mylar sheets and five sets of full size blue line copies.

The final submission shall be made within 14 days of acceptance by the Department. No work shall be performed on the retaining wall until the final submission has been received.

Acceptance of the final design shall not relieve the Contractor of his responsibility under the contract for the successful completion of the work.

The actual designer of the proprietary retaining wall is responsible for the review of any shop drawings prepared for the fabrication of the wall. One set of full size blue line copies of all approved shop drawings shall be submitted to the Department's permanent records.

## 5 – General Design Requirements

a. All designs for proprietary walls and temporary earth retaining systems (if required) shall conform to the latest edition of the American Association of State Highway and Transportation Officials (AASHTO) Standard Specifications for Highway Bridges including the latest Interims published except as noted otherwise herein.

b. The wall design shall follow the dimensions of the wall envelope shown in the contract drawings.

For all proprietary walls, the top of the leveling pad or reinforced concrete toe footing shall be located at or below the bottom of the footing elevation shown on the contract drawings. If no footing elevation is shown, the minimum wall embedment shall be four feet as measured to the top of the leveling pad or toe footing.

If steps at the bottom of the wall are required, they shall be kept at or below the footing elevation shown on the contract drawings. Steps in addition to those shown on the contract drawings will be permitted at no additional cost to the Department.

c. The wall shall be designed to be within all property lines and easement lines shown on the contract drawings. If additional work areas are necessary for the construction of the proprietary retaining wall, the Contractor shall be responsible for obtaining the rights from the affected property owners. Copies of these rights shall be forwarded to the Department.

d. The top of the wall shall be at the top of the wall elevations shown on the contract drawings. Where coping or barrier is utilized, the wall face panel shall extend up into the coping or barrier a minimum of two inches. The top of the face panels may be level or sloped to meet the top of the wall line noted.

e. Cast-in-place concrete will not be an acceptable replacement for areas noted by the wall envelope, except for minor grouting of pipe penetrations and leveling required for coping or traffic barrier.

f. The wall shall be designed for a minimum live load surcharge equal to two feet of soil at a unit weight of 125 pounds per cubic foot. If there are specific live load surcharges acting on the wall, they shall also be accounted for. The minimum equivalent fluid pressure used to design the wall shall be 33 pounds per cubic foot per linear foot of wall.

g. If stated on the contract drawings, the wall shall be designed for seismic forces according to the AASHTO Specifications.

h. If the wall is detailed with a concrete parapet, the top two courses of prefabricated modular walls units shall be designed to support a transverse railing load of 10 kips. The 10 kip load may be distributed over the length of the parapet section between joints, but not exceeding

20 feet. Computations that verify the stability of the top two courses of the modular units shall be submitted to the Engineer.

The detailing and reinforcement in the parapet section above the gutterline or finished grade, including any light standard attachments, shall be as shown on the contract drawings.

i. The wall shall be designed to accommodate all roadway drainage and drainage structures as shown on the contract drawings.

j. The maximum allowable bearing pressure of the soil shall be as shown on the contract drawings. The bearing pressure stated assumes a uniform pressure distribution. If additional soils information is required by the Contractor’s designer, it must be obtained by the Contractor and will not be reimbursed by the Department.

k. Parapet and Moment slab Design:

- General requirement for parapet and moment slab design:

The parapet and moment slab shall be designed in accordance the AASHTO Standard LRFD Bridge Design Specifications – 2007, including the latest interim specifications and errata, amended as follows:

The parapet shall be designed and constructed of precast or cast-in-place concrete. The moment slab shall be designed and constructed of cast-in-place reinforced concrete.

Above the finished grade, the parapet dimensions, concrete and reinforcement shall conform to the Department’s retaining wall parapet details. Below the finished grade, the parapet shall be designed to resist the forces specified in Table A13.2-1 of the AASHTO LRFD Bridge Design Specifications for the parapet types indicated below:

Parapet Type	AASHTO LRFD Test Level
42” High Standard Parapet	TL-4
32” High Standard Parapet	TL-3
Sidewalk Parapet	TL-3

The moment slab and its connection to the parapet shall be designed to resist, at a minimum, a transverse load equal to 133% of  $F_t$ . The length of the structural connection between parapet and moment slab assumed to resist transverse force  $F_t$  shall be the distance between parapet joints but not greater than 30 feet in any case. The length of the moment slab assumed to resist sliding and overturning may exceed parapet joint spacing but shall be no greater than 30 feet in any case. The moments shall be summed about the front face of the wall facing. All resistance factors shall

be taken as 1.0. The internal angle of friction for the soil shall be assumed to be 34 degrees unless otherwise shown on the contract plans.

Minimum concrete cover for reinforcing steel shall be 2 inches for top bars and 3 inches for bottom bars

- Precast Concrete Parapet Alternative:

Precast parapet sections shall be no less than 8 feet in length.

Parapets shall include details for shear transfer between adjacent units by either concrete shear keys or steel dowels as follows:

- Shear keys when used shall be monolithically cast in each parapet section or joint location. Shear keys shall be located vertically within the top 32 inches of the parapet and shall be a minimum of 24 inches in length with a tapered width between 3 and 4 inches, and a minimum interlock depth of 2 inches.
- Steel dowels when used shall be a minimum of 3 in number, smooth, 14 inches long minimum, and 1 inch diameter at each parapet interface. Steel dowels shall be located in each parapet joint and spaced approximately 1 foot apart vertically. Steel dowels shall be positioned to project equally into each adjoining parapet sections and shall be detailed to avoid impeding shrinkage and thermal movements. Bond breakers may be used with steel dowels for that purpose. Alternatively, pockets may be cast to receive steel dowels in adjacent parapet units. Pocket widths shall not exceed steel dowel diameters by more than ½ inch.

Moment slabs for precast concrete parapets shall be structurally continuous throughout the overall wall length. Construction joints are permitted in moment slabs.

- Cast-in-Place Parapet Alternative:

The minimum distance between parapet joints shall be 20 feet. Expansion and contraction joints shall be placed in accordance with Section 11.6 of the AASHTO LRFD Bridge Design specifications. Expansion and contraction joints shall be located a minimum of 10 feet from the nearest edge of a catch basin. Expansion and contraction joints shall be located a minimum of 6 feet from the centerline of light standard anchorages and junction boxes. Preformed expansion joint filler, ½ inch thick, shall be installed at the expansion joints in the parapet.

Parapets shall include details for shear transfer between sections by way of concrete shear keys or steel dowels as follows:

- Shear keys when used shall be monolithically cast in each parapet section or joint location. Shear keys shall be located vertically within the top 32 inches of the parapet and shall be a minimum of 24 inches in length with a tapered width between 3 and 4 inches, and a minimum interlock depth of 2 inches.
- Steel dowels when used shall be a minimum of 3 in number, smooth, 14 inches long minimum, and 1 inch diameter at each parapet interface. Steel dowels shall be located in each parapet joint and spaced approximately 1 foot apart vertically. Steel dowels shall be positioned to project equally into each adjoining parapet sections and shall be detailed to avoid impeding shrinkage and thermal movements. A bond breaker shall be used with steel dowels for that purpose.

Moment slabs for cast-in-place parapets shall extend to the outside face of the retaining wall as shown on the plans. Moment slabs for cast-in-place parapets shall be structurally continuous throughout the overall wall length except at parapet contraction and expansion joint locations where longitudinal reinforcing within 2 feet of the wall face shall be discontinuous for the purpose of crack control. All remaining longitudinal reinforcing in moment slabs at parapet expansion and contraction joint locations shall be continuous. A vertical 1" deep chamfer on the exposed face of the moment should be provided in locations directly under parapet expansion and contraction joints. Construction joints are permitted in moment slabs for cast-in-place concrete.

6 - Design Requirements for Mechanically Stabilized Earth Walls: The design shall consider the internal stability of the wall mass as outlined below. The global stability of the structure, including slope stability, bearing capacity safety, and total and differential settlement is the responsibility of the Department.

a. Hydrostatic Forces: Unless specified otherwise, when a design high water surface is shown on the contract drawings at the face of the wall, the design stresses calculated from that elevation to the bottom of wall must include a three foot minimum differential head of saturated backfill. In addition, the buoyant weight of saturated soil shall be used in the calculation of pullout resistance.

b. Backfill: The friction angle of the pervious structure backfill used in the reinforced fill zone for the internal stability design of the wall shall be assumed to be 34 degrees unless

shown otherwise on the contract drawings. The friction angle of the in-situ soils shall be assumed to be a maximum of 30 degrees unless otherwise shown on the Contract drawings.

c. Soil Reinforcement: The soil reinforcement shall be the same length from the bottom to the top of each wall section. The reinforcement length defining the width of the entire reinforced soil mass may vary with wall height along the length of wall. The minimum length of the soil reinforcement shall be seventy percent of the wall height, H, or eight feet, whichever is greater.

The soil reinforcement length shall be sufficient to satisfy the sliding, overturning and pullout factors of safety designated in AASHTO Specifications and the minimum lengths required for external stability as recommended by the Department. Calculation of stresses and pullout factors of safety shall be in accordance with the AASHTO Specifications for Highway Bridges.

Calculations for stresses and factors of safety shall be based on assumed conditions at the end of the design life. The design life shall be 75 years unless otherwise indicated on the contract drawings. The design of soil reinforcements shall account for section loss as outlined in the AASHTO Specifications. All soil reinforcement shall be hot dipped galvanized.

7 - Design Requirements for Prefabricated Modular Walls: The general design of the wall shall be according to the AASHTO Specifications. The design shall consider the stability at each level of modules. The global stability of the structure, including slope stability, bearing capacity safety, and total and differential settlement is the responsibility of the Department.

a. Hydrostatic Forces: Unless specified otherwise, when a design high water surface is shown on the contract drawings at the face of the wall, the design stresses calculated from that elevation to the bottom of wall must include a three foot minimum differential head of saturated backfill. In addition, the buoyant weight of saturated soil shall be used in the calculation of pullout resistance.

b. Backfill: The friction angle of the pervious structure backfill shall be assumed to be 34 degrees if sufficient amounts of pervious backfill are used. The friction angle of the in-situ soils shall be assumed to be a maximum of 30 degrees unless otherwise shown on the Contract drawings.

c. Infill: The maximum assumed unit weight of infill material used for determining the factor of safety for overturning shall be 100 pounds per cubic foot. If Doublewal modules are to be filled with crushed stone, the maximum assumed unit weight of the infill shall be 80 pounds per cubic foot.

d. Safety Factors: The minimum factors of safety shall be as specified in the AASHTO Specifications amended as follows. The factor of safety for T-Wall shall be 1.5 for pullout of the concrete stem. Shear keys are not to be included in these computations. Only

resisting forces developed beyond the theoretical failure plane may be used in these computations.

**Materials:**

1 - Cast-in Place Concrete Walls: The materials furnished and used in the work shall be those prescribed within the Standard Specifications for Roads, Bridges and Incidental Construction, including supplemental specifications and applicable special provisions.

2 - Prefabricated Modular and Mechanically Stabilized Earth Walls: Materials shall conform to the following requirements and those not listed below shall be as prescribed within the Standard Specifications for Roads, Bridges and Incidental Construction, including supplemental specifications and applicable special provisions.

a. Concrete: The concrete shall conform to the requirements of Section M.03 and as follows:

Concrete for all precast components shall be air-entrained composed of portland cement, fine and coarse aggregates, admixtures and water. The air-entraining feature may be obtained by the use of either air-entraining portland cement or an approved air-entraining admixture. The entrained-air content shall be not less than four percent or more than seven percent. The concrete utilized shall be a mix which will attain a minimum 28-day strength ( $f'_c$ ) of 4,500 pounds per square inch. The mix design shall be furnished to the Engineer.

Concrete for footings or unreinforced leveling pads shall be conform to the requirements of Class "A" Concrete. Class "F" Concrete shall be used for cast-in-place concrete copings.

Concrete Finish: Unless otherwise indicated on the contract drawings or elsewhere in the specifications, the concrete surface for the exposed face shall have an ordinary steel form finish. All non-exposed surfaces shall have a unformed finish which shall be free of open pockets of aggregate and surface distortions in excess of 1/4 inch.

Acceptance Criteria for Precast Components: Precast components shall be accepted for use in wall construction provided the concrete strength meets or exceeds the minimum compressive strength requirement, the soil reinforcement connection devices and the panel or module dimensions are within the manufacture's allowable tolerances and any chipping, cracks, honeycomb or other defects are within acceptable standards for precast concrete or repaired as determined by the Engineer.

It is recognized that certain cracks and surface defects are not detrimental to the structural integrity of the precast components if properly repaired. The Engineer shall determine the need for and proper method of such repair. All repairs shall be approved by the Engineer prior to acceptance of the precast component for use in wall construction.

Marking: The date of manufacture, the production lot number, and the piece-mark shall be clearly marked on the side of each panel or module.

b. Reinforcing Steel: Reinforcing steel shall conform to the requirements of ASTM A615, Grade 60.

c. Attachment Devices for Prefabricated Modular Walls: All structural connectors shall be hot dipped galvanized according to the requirements of ASTM A123 (AASHTO M-111). The minimum thickness of the galvanizing shall be based on the service life requirements in the AASHTO Specifications.

d. Soil Reinforcing and Attachment Devices for MSE Walls:

Soil Reinforcement: All soil reinforcement and structural connectors shall be hot dipped galvanized according to the requirements of ASTM A123 (AASHTO M-111). The minimum thickness of the galvanizing shall be based on the service life requirements as previously stated.

Steel strip reinforcement shall be hot rolled to the required shape and dimensions. The steel shall conform to AASHTO M223 (ASTM A572) Grade 65 unless otherwise specified.

Welded wire fabric reinforcement shall be shop fabricated from cold-drawn wire of the sizes and spacings shown on the plans. The wire shall conform to the requirements of ASTM A82, fabricated fabric shall conform to the requirements of ASTM A185.

Connection Hardware: Connection hardware shall conform to the details on the plans and the requirements in the special provisions or the plans. All fasteners shall be galvanized according to the requirements of ASTM A-153 (AASHTO M-232). The minimum thickness of the galvanizing shall be based on the service life requirements as previously stated.

e. Joint Materials: All horizontal and vertical joints between panels shall be covered by a geotextile (separation-high survivability) conforming to the requirements of Article M.08.02-26. The minimum width and lap shall be twelve inches. Details of installation including connection of the geotextile to coping shall be provided.

f. Backfill: Backfill shall be pervious structure backfill conforming to the requirements of Articles M.02.05 and M.02.06.

In addition, the backfill for Mechanically Stabilized Earth Walls shall conform to all of the following requirements:

Electrochemical Requirements: The backfill material shall conform to the following electrochemical requirements:

PROPERTY	REQUIREMENT	TEST METHODS
Resistivity at 100%	Minimum 3000 ohm-cm	ASTM G-57-78

saturation		AASHTO T-288-91I
pH	Acceptable Range 5-10	ASTM G-51-77 AASHTO T-289-91I
Chlorides	Maximum 100 ppm	ASTM D-512-88 AASHTO T-291-91I
Sulfates	Maximum 200 ppm	ASTM D-516-88 AASHTO T-290-91I

g. Smooth Steel dowels : Steel dowels used in parapets joints shall conform to the requirements of ASTM A36 and shall be galvanized in conformance with the requirements of ASTM A153.

**Construction Methods:**

1 - Cast-in-Place Concrete Walls: All construction methods for cast-in-place retaining walls shall be in accordance with the detailed requirements prescribed for the construction the appropriate items as specified in the Standard Specifications for Roads, Bridges, and Incidental Construction.

2 - Prefabricated Modular Walls: All construction methods for items not listed below shall be in accordance with the detailed requirements prescribed for the construction of the appropriate items as specified in the Standard Specifications for Roads, Bridges, and Incidental Construction.

a. Special Surface Treatment: If a special surface finish is proposed for the wall, before proceeding with production, a model modular unit shall be provided by the fabricator for the Engineer's approval to establish a guide and standard for the type of finish to be furnished on the exposed face. This model shall be kept at the fabricator's plant to be used for comparison purposes during production. Formed surfaces other than the exposed face shall not require a special finish.

b. Inspection and Rejection: The quality of materials, the process of manufacture, and the finished units shall be subject to inspection by the Engineer prior to shipment.

Modular units which have imperfect molding, honeycomb, open texture concrete, or broken corners shall be repaired to the satisfaction of the Engineer or shall be rejected. Insufficient compressive strength shall also be cause for rejection.

Modular units with special surface treatments shall be rejected if there are variations in the exposed face that deviate from the approved model as to color or texture in accordance with precast concrete industry standards.

c. Marking: The date of manufacture shall be clearly scribed on an inside surface of each modular unit.

d. On Site Representative: A qualified and experienced representative from the wall supplier shall be at the site at the initiation of the wall construction to assist the Contractor and the Engineer. If there is no more than one wall on a project then this criteria will apply to construction of the initial wall only. The representative shall also be available on as needed basis, as requested by the Engineer.

e. Installation: The modular units shall be installed in accordance with manufacturer's recommendations. Special care shall be taken in setting the bottom course of units to true line and grade.

The vertical joint opening on the front face of the wall shall not exceed 3/4 inch. Vertical tolerances and horizontal alignment tolerances measured from the face line shown on the

contract drawings shall not exceed 3/4 inch when measured along an eight straightedge. The overall tolerance of the wall from top to bottom shall not exceed 1/2 inch per eight feet of wall height or one inch total, whichever is the lesser, measured from the face line shown on the contract drawings. A strip of geotextile shall be installed at all vertical joints.

Assembly of the various components shall be performed in such a manner that no undue strain or stress is placed on any of the members that constitute the completed structure.

f. Backfilling:

Doublewal:

Infill for modular units shall be placed, one course at a time, in lifts not exceeding two feet in thickness. The dry density of each lift of pervious structure backfill placed inside the modular units, after compaction, shall not be less than 90 percent of the dry density for that material when tested in accordance with AASHTO T-180, Method D. Each lift shall be thoroughly compacted with a vibratory tamping device.

Placement of the pervious structure backfill behind the wall shall closely follow erection of successive courses of modular units. At no time shall the difference in backfill elevation between the interior and exterior of the wall exceed six feet.

The units may be backfilled with crushed stone, provided that the design of the wall was based on a density of 80 pounds per cubic foot.

All pervious structure backfill placed outside of the modular units shall be placed in accordance with the requirements of Article 2.16.03.

T-Wall:

Backfill placement shall closely follow erection of each course of modules. Backfill shall be placed in such a manner as to avoid any damage or disturbance to the wall materials or misalignment of the modules. Any wall materials which become damaged or disturbed during backfill placement shall be either removed and replaced at the Contractor's expense or corrected, as directed by the Engineer. Any backfill material placed within the wall envelope which does not meet the requirements of this specification shall be corrected or removed and replaced at the Contractor's expense.

Backfill shall be compacted to 95 percent of the maximum density as determined by AASHTO T-99, Method C or D (with oversize correction, as outlined in Note 7).

The moisture content of the backfill material prior to and during compaction shall be uniform throughout each layer. Backfill material shall have a placement moisture content less than or equal to the optimum moisture content. Backfill material with a placement moisture content in excess of the optimum moisture content shall be removed and reworked until the

moisture content is uniform and acceptable throughout the entire lift. The optimum moisture content shall be determined in accordance with AASHTO T-99, Method C or D (with oversize correction, as outlined in Note 7).

If 30 percent or more of the backfill material is greater than 3/4 inch in size, AASHTO T-99 is not applicable. For such a material, the acceptance criterion for control of compaction shall be either a minimum of 70 percent of the relative density of the material as determined by a method specification provided by the wall supplier, based on a test compaction section, which defines the type of equipment, lift thickness, number of passes of the specified equipment, and placement moisture content.

The maximum lift thickness after compaction shall not exceed ten inches. The Contractor shall decrease this lift thickness, if necessary, to obtain the specified density.

Compaction within three feet of the face of the modules shall be achieved by at least three passes of a lightweight mechanical tamper, roller or vibratory system. The specified lift thickness shall be adjusted as warranted by the type of compaction equipment actually used. Care shall be exercised in the compaction process to avoid misalignment or damage to the module. Heavy compaction equipment shall not be used to compact backfill within three feet of the wall face.

At the end of each day's operation, the Contractor shall slope the last level of backfill away from the wall facing to direct runoff of rainwater away from the wall face. The Contractor shall control and divert runoff at the ends of the wall such that erosion or washout of the wall section does not occur. In addition, the Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

3 - Mechanically Stabilized Earth Walls: All construction methods for items not listed below shall be in accordance with the detailed requirements prescribed for the construction of the appropriate items as specified in the Standard Specifications for Roads, Bridges, and Incidental Construction.

a. Special Surface Treatment: If a special surface finish is proposed for the wall, before proceeding with production, a model face panel shall be provided by the fabricator for the Engineer's approval to establish a guide and standard for the type of finish to be furnished on the exposed face. This model shall be kept at the fabricator's plant to be used for comparison purposes during production. Formed surfaces other than the exposed face shall not require a special finish.

b. Foundation Preparation: The foundation for the structure shall be graded level for a width equal to or exceeding the length of the soil reinforcements, or as shown on the plans. Prior to wall construction, the foundation, if not in rock, shall be compacted. Any foundation soils found to be unsuitable shall be removed and replaced with granular fill.

At each panel foundation level, an un-reinforced concrete leveling pad shall be provided as shown on the plans. The leveling pad shall be cast to the design elevations as shown on the plans.

c. On Site Representative: A qualified and experienced representative from the wall supplier shall be at the site at the initiation of the wall construction to assist the Contractor and the Engineer. If there is no more than one wall on a project then this criteria will apply to construction of the initial wall only. The representative shall also be available on as needed basis, as requested by the Engineer.

d. Wall Erection: Panels shall be placed in successive horizontal lifts in the sequence shown on the plans as backfill placement proceeds. As backfill material is placed behind the panels, the panels shall be maintained in a vertical position. Vertical tolerances (plumbness) and horizontal alignment tolerances shall not exceed 3/4 inch in eight feet. The allowable offset in any panel joint shall be 3/4 inch. The overall vertical tolerance of the wall (plumbness from top to bottom) shall not exceed 1/2 inch per eight feet, or one inch total, which ever is the lesser, measured from the face line shown on the plans.

e. Placement of Reinforcements: Bending of reinforcements in the horizontal plane that results in a permanent deformation in their alignment shall not be allowed. Gradual bending in the vertical direction that does not result in permanent deformations is allowable.

Connection of reinforcements to piles or bending of reinforcements around piles shall not be allowed. A structural connection (yoke) from the wall panel to the reinforcement shall be used whenever it is necessary to avoid cutting or excessive skewing of reinforcements due to pile or utility conflicts.

Soil reinforcements shall be placed normal to the face of the wall, unless otherwise shown on the plans.

f. Backfill Placement: Backfill placement shall closely follow erection of each course of panels. Backfill shall be placed in such a manner as to avoid any damage or disturbance to the wall materials or misalignment of the facing panels. Any wall materials which become damaged or disturbed during backfill placement shall be either removed and replaced at the Contractor's expense or corrected, as directed by the Engineer. Any backfill material placed within the reinforced soil mass which does not meet the requirements of this specification shall be corrected or removed and replaced at the Contractor's expense.

Backfill shall be compacted to 95 percent of the maximum density as determined by AASHTO T-99, Method C or D (with oversize correction, as outlined in Note 7).

The moisture content of the backfill material prior to and during compaction shall be uniform throughout each layer. Backfill material shall have a placement moisture content less than or equal to the optimum moisture content. Backfill material with a placement moisture content in excess of the optimum moisture content shall be removed and reworked until the

moisture content is uniform and acceptable throughout the entire lift. The optimum moisture content shall be determined in accordance with AASHTO T-99, Method C or D (with oversize correction, as outlined in Note 7).

If 30 percent or more of the backfill material is greater than 3/4 inch in size, AASHTO T-99 is not applicable. For such a material, the acceptance criterion for control of compaction shall be either a minimum of 70 percent of the relative density of the material as determined by a method specification provided by the wall supplier, based on a test compaction section, which defines the type of equipment, lift thickness, number of passes of the specified equipment, and placement moisture content.

The maximum lift thickness after compaction shall not exceed ten inches, regardless of the vertical spacing between layers of soil reinforcements. The Contractor shall decrease this lift thickness, if necessary, to obtain the specified density. Prior to placement of the soil reinforcements, the backfill elevation at the face shall be level with the connection after compaction. From a point approximately three feet behind the back face of the panels to the free end of the soil reinforcements the backfill shall be two inches above the attachment device elevation unless otherwise shown on the plans.

Compaction within three feet of the back face of the panels shall be achieved by at least three passes of a lightweight mechanical tamper, roller or vibratory system. The specified lift thickness shall be adjusted as warranted by the type of compaction equipment actually used. Care shall be exercised in the compaction process to avoid misalignment of the panels or damage to the attachment devices. Heavy compaction equipment shall not be used to compact backfill within three feet of the wall face.

At the end of each day's operation, the Contractor shall slope the last level of backfill away from the wall facing to direct runoff of rainwater away from the wall face. The Contractor shall control and divert runoff at the ends of the wall such that erosion or washout of the wall section does not occur. In addition, the Contractor shall not allow surface runoff from adjacent areas to enter the wall construction site.

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

**Basis of Payment:** This work will be paid for at the contract lump sum for "Retaining Wall (Site No.   )", complete in place, which price shall include all work shown within the pay limits shown on the contract drawings for the retaining wall including but not limited to the following:

1. Design and construction of the proprietary retaining wall.
2. Excavation required for the construction of the retaining wall.
3. Design and construction of temporary earth retaining systems to retain the existing facilities during construction.

4. The furnishing, placing and compacting of pervious structure backfill within the payment lines.
5. The furnishing and placing of backfill drainage systems for the wall.
6. The furnishing and placing of rigid metal conduit, junction boxes, light standard anchorages, and other electrical appurtenances located within the wall proper.
7. Services of the On-Site Representative.
8. Any other work and materials shown on the plans for the retaining wall.

The price shall also include all materials, equipment, tools and labor incidental thereto.

If bedrock or boulders in excess of one cubic yard are encountered in the excavation, it shall be paid for under the item "Structure Excavation - Rock".

<u>Pay Item</u>	<u>Pay Unit</u>
Retaining Wall (Site No. 4)	LS

## **ITEM #0603324A - PEDESTRIAN BRIDGE**

**Description:** Work under this item shall consist of designing, fabricating, furnishing, galvanizing, painting, transporting and erecting a prefabricated pedestrian bridge superstructure as shown on the plans, as directed by the Engineer and in accordance with this specification. The prefabricated pedestrian bridge shall precisely resemble the drawings shown in the plans in terms of make, general appearance and aesthetic appeal.

Supplier/Fabricator Qualifications:

Each bidder is required to identify the intended bridge supplier listed below as part of the bid submittal. Pre-approved Fabricator:

Bridge Brothers Inc  
Atlanta, GA  
Phone: 866.258.3401  
Email: [sales@bridgebrothersinc.com](mailto:sales@bridgebrothersinc.com)

Contech Engineered Solutions  
West Chester, OH 45069  
Phone: 800.338.1122  
Email: [info@conteches.com](mailto:info@conteches.com)

Suppliers other than those listed above may be used provided the Engineer evaluates the proposed supplier and approves the supplier ten (10) days prior to bid. The contractor must provide the following documentation, for any proposed supplier who is not listed above for approval:

\* Product Literature

\* All documentation to ensure the proposed substitution will be in compliance with these specifications. This shall include:

- Project specific design calculations
- Project specific shop drawings
- Splicing and erection procedures
- Warranty information
- Inspection and Maintenance procedures

### **Materials:**

**Steel Superstructure:** The prefabricated pedestrian bridge shall be hot dip galvanized and painted red. Steel shall be fabricated from ASTM A36, A572, or A992 and tubular sections from ASTM A500 GR B or C. Contractor shall have the color approved by the Municipality prior to fabrication.

**Bolts:** Field splices shall be fully bolted with ASTM A325 high strength bolts in accordance with the AASHTO Specifications for Structural Joints. Type 1 hardware shall be used for painted or galvanized finishes.

**Composite Decking:** The deck shall be wood-plastic composite and conform to ASTM D7032 for both material and structural testing. Fasteners for deck boards shall be tested per ASTM D161. The Contractor shall have the final decking selection approved by the Municipality.

**Bolts:** Anchor bolts shall be fully threaded stainless steel rods and conform to A193, Class 2, Grade 8 (UNS designation S 30400 (304)). The nuts shall be prevailing-torque reusable-type (with nylon insert) lock nuts and conform to A194, Grade 8, strain hardened (UNS designation S030400 (304)). Washers shall be 5/16" thick stainless steel and conform to ASTM A276, Type 304, annealed. The number and size of the anchor bolts shall be determined by the bridge fabricator. The anchor bolts shall be designed to resist all horizontal and uplift forces to be transferred by the superstructure to the supporting foundations. Bridge seat elevations and anchor bolt locations shall be determined by the bridge fabricator. The contractor shall install the anchor bolts in accordance with the fabricator's bridge bearing dimensions and installation recommendations.

**Bearings:** Bearings shall be neoprene elastomeric bearing pads designed in accordance with AASHTO LRFD Bridge Design Specifications (10th Edition). The bridge bearing plate shall be welded to the bridge structure. One end of the bridge will be fixed by fully tightening the nuts on the anchor bolts at that end. The opposite end will have finger tight only nuts to allow movement under thermal expansion or contraction.

## **Construction Methods:**

### Design Codes and Standards:

Governing Codes and Standards: Bridges shall be designed in accordance with the AASHTO Guide Specification for the Design of Pedestrian Bridges, latest edition, where applicable and unless otherwise stated in the document.

### Reference Codes and Standards:

- AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges, 2009
- AASHTO LRFD Bridge Design Specifications, 10th edition, 2024
- AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, latest edition
- AASHTO Guide Specifications for LRFD Seismic Bridge Design, latest edition
- AASHTO M 133 Standard Specification for Preservatives and Pressure Treatment Processes for Timber, latest edition
- Steel Deck Institute (SDI), C-2017 Standard for Composite Steel Floor Deck-Slabs
- AISC Part 16.1-2010 Specification for Structural Steel Buildings
- AWS D1.1 Structural Welding Code – Steel, latest edition
- Guide to Stability Design Criteria for Metal Structures, latest edition

- National Design Specification for Wood Construction, ANSI NDS, latest edition
- American Wood Preservers Association Standards, latest edition

### General Design Features:

**Truss Style:** The bridge shall be designed as a half-through Pratt truss with one (1) diagonal per panel and square ended vertical members. All vertical members, unless specified otherwise, shall be plumb or perpendicular as determined during design.

Bridges may be designed utilizing an H-Section configuration where the floor beams are placed up inside the trusses or utilizing a U-Section configuration where the floor beam is welded to the bottom of the bottom chord.

The distance from the top of the deck to the top and bottom truss members shall be determined by the bridge fabricator based upon structural and/or shipping requirements. When the bridge is in the floodplain, the overall height of the truss and distance from the deck to the bottom chord shall be minimized as much as possible.

The top of the top chord shall not be less than forty-two inches (42") above the deck (measured from the high point of the walking surfaces).

**Member Components:** All members of the vertical trusses (top and bottom chords, verticals, and diagonals) shall be fabricated from square and/or rectangular structural steel tubing. Other structural members and bracing shall be fabricated from structural steel shapes or square and rectangular structural steel tubing.

**Safety Rails:** Horizontal safety rails shall be placed on the structure up to a minimum height of forty-two inches (42") above the deck surfaces. Safety rails shall be placed so as to prevent a four-inch (4") sphere from passing through the truss. Safety rails shall be welded to the inside or outside of the structure. Safety rails shall have their ends sealed and ground smooth so as to produce no sharp edges if safety rails are placed on the inside of the structure.

**Camber:** The bridge shall have a vertical camber dimension at midspan equal to one hundred percent (100%) of the full dead load deflection.

**Elevation Difference:** The bridge abutments shall be constructed at the same elevation on both ends of the bridge or as required by the contract documents. Bridge shall have plumb verticals and flat base plates in all scenarios.

### Design:

Structural design of the bridge shall be performed by or under the direct supervision of a professional engineer licensed within the state of Connecticut, and in accordance with recognized engineering practices and principles.

**Design Loads:** In considering design and fabrication issues, this structure shall be assumed to be statically loaded. No dynamic analysis shall be required nor shall fabrication issues typically considered for dynamically loaded structures be considered for this bridge.

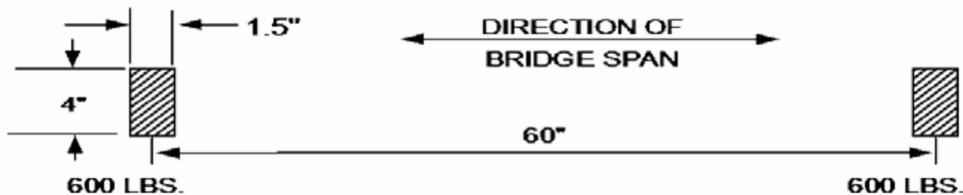
**Dead Loads:** The bridge structure shall be designed considering its own dead load (superstructure and original decking) only. No additional dead loading shall be considered.

**Pedestrian Live Load:**

- Main supporting members, including girders, trusses and arches shall be designed for a pedestrian live load of ninety pounds (90lbs) per square foot of bridge walkway area. The pedestrian live load shall be applied to those areas of the walkway so as to produce maximum stress in the member being designed. Pedestrian live loads shall NOT be reduced.
- Secondary members such as bridge decks and supporting floor systems, including secondary stringers, floor beams, and their connections to main supporting members shall be designed for a live load of ninety pounds (90lbs) per square foot, with no reduction allowed.

**Vehicle Load:** The bridge superstructure, floor system, and decking shall be designed for the following point load conditions:

- a) An occasional twelve hundred pound (1,200 lb) two wheeled vehicle with a wheelbase and tire print area as shown in the following diagram:



All the concentrated or wheel loads shall be placed so as to produce the maximum stress in each member being analyzed. Critical stresses shall be calculated assuming there is only one (1) vehicle on the bridge at any given time. Assumptions that vehicles only travel down the center of the bridge or that the vehicle load is a uniform line load shall not be allowed. A vehicle impact allowance shall not be required.

- b) For bridges with clear deck widths of seven (7) feet or more, the vehicular loading shall be specified in Section 3.2 of the LRFD Guide Specifications for the Design of Pedestrian Bridges.

All the concentrated or wheel loads shall be placed so as to produce the maximum stress in each member being analyzed. Critical stresses shall be calculated assuming there is only one (1)

Wind Load:

- a) Horizontal Forces - The bridge shall be designed for a wind load as specified by AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges, latest edition. The wind load shall be applied horizontally at right angles to the longitudinal axis of the structure.  
The wind load shall be considered both in the design of the lateral load bracing system and in the design of the truss vertical members, floor beams, and their connections.
- b) Overturning Forces - The effect of forces tending to overturn structures shall be calculated assuming that the wind direction is at right angles to the longitudinal axis of the structure. In addition, an upward force shall be applied at the windward quarter point of the transverse superstructure width. This force shall be twenty pounds (20lbs) per square foot of deck.

Top Chord Railing Loads: The top chord, truss verticals, and floor beams shall be designed for lateral wind loads, per Engineering – Horizontal Forces, herein and for any loads required to provide top chord stability as outlined in Engineering – Top Chord Stability herein. In no case shall the load be less than fifty pounds (50lbs) per lineal foot and a two hundred pound (200lb) point load, acting concurrently, applied in any direction at any point along the top chord, or at the top of the safety system (42” or 54” above the deck level) if higher than the top chord.

Safety Rails: The safety rail system shall be designed for loading of a two hundred pound (200 lbs) point load and fifty pounds per lineal foot (50plf) acting currently applied horizontally at right angles

Picket Railing: Picket railing shall be designed for infill loads of 50 pounds per square foot (50psf), applied horizontally at right angles

Design Limitations:

1. Deflection:

- Vertical Deflection - The vertical deflection of the main trusses due to service pedestrian Live Load shall not exceed one three-sixtieth (1/360) of the span. The vertical deflection of cantilever spans of the structure due to service pedestrian Live Load shall not exceed one two-twentieth (1/220) of the cantilever arm length.

The deflection of the floor beams due to service pedestrian Live Load shall not exceed one three-sixtieth (1/360) of its span.

The deflection of the deck and stringers due to service pedestrian Live Load or Vehicle Load shall not exceed one three-sixtieth (1/360) of their respective spans. The service pedestrian Live Load shall NOT be reduced for deflection checks.

- Horizontal Deflection - The horizontal deflection of the structure due to lateral wind loads shall not exceed one three-sixtieth (1/360) of the span.
2. Vibration: The fundamental frequency of the unloaded pedestrian bridge shall be no less than 3.0 Hz to avoid the first harmonic.
  3. Minimum Thickness of Metal: The minimum thickness of all main structural steel members shall be one-quarter of an inch (1/4") nominal and be in accordance with the AISC Manual of Steel Constructions "Standard Mill Practice Guidelines". For ASTM A500 and ASTM A847 tubing, the section properties used for design shall be per the Steel Tube Institute of North America, Hollow Structural Sections, "Dimensions and Section Properties".

Analysis:

1. Load Combinations: The loads listed herein shall be considered to act in the following combinations, whichever produce the most unfavorable effects on the bridge superstructure or structural member concerned.

[DL = Dead Load, LL = Live Load, WL = Wind Load, VL = Vehicle Load]

- Strength I
    - $1.25*DL+1.75*LL$
    - $1.25*DL+1.75*VL$
  - Strength III
    - $1.25*DL+WL+OW$
  - Service I
    - $DL+LL+WL+OW$
  - Fatigue I
    - Fatigue WL Only
2. Frequency: Frequency analysis shall be completed to determine that the bridge frame is sufficient to avoid resonance due to frequencies likely encountered under normal use for the following load combinations and in accordance with section 6 of AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges, latest edition
    - Service I
    - DL Only

3. Top Chord Stability: The top chord of a half-through truss shall be considered as a column with elastic lateral supports at the panel points. Contributions of the connection stiffness between the floor beam and vertical member shall be considered in accordance with section 7.1.2 of AASHTO LRFD Guide Specifications for the Design of Pedestrian Bridges, latest edition
4. Welded Tubular Connections: All welded tubular connections shall be checked, when within applicable limits, for the limiting failure modes outlined in the ANSI/AWS D1.1 Structural Welding Code.

When outside the “validity range” defined in these design guidelines, the following limit states or failure modes shall be checked:

- Chord Wall Plastification
- Shear Yielding (Punching)
- Local Yielding of Chord Sidewalls
- Local Crippling of Chord Sidewalls
- Local Yielding of Branch Due to Uneven Load Distribution

All tubular joints shall be plain unstiffened joints and fabricated without the use of reinforcing plates, except as follows:

Floor beams hung beneath the lower chord of the structure may be constructed with or without stiffener (or gusset) plates, as required by design.

Floor beams which frame directly into the truss verticals (H-Section bridges) may be designed with or without end stiffening plates as required by design.

Where chords, end floor beams and in high profiles the top end struts weld to the end verticals, the end verticals (or connections) may require stiffening to transfer the forces from these members into the end vertical.

Truss vertical to chord connections.

5. Bolted Splices: Bolted splice design shall be in accordance with Section 6.13 of the “AASHTO LRFD Bridge Design Specifications” latest edition and in accordance with section 1.4 of this document. Bolted field splices shall be located on the bridge so as to produce a structure which can be economically shipped and erected. Splices across the width of the bridge (in floor beams and wind braces) may be used, when necessary, to keep the overall structure width within reasonable limits for shipping.

Welding: Welding and weld procedure qualification tests shall conform to the provisions of ANSI/AWS D1.1 “Structural Welding Code”, latest edition. Filler metal shall comply with the applicable AWS Filler Metal Specification (i.e. AWS A 5.28 for the GMAW Process). For exposed, bare, unpainted applications of corrosion resistant steels (i.e. ASTM A588 and A847), the filler metal shall comply with AWS D1.1, Section 3.7.3.

Each welder shall be a properly accredited operator, and shall:

- submit certification of satisfactorily passing AWS standard qualification tests for all positions with unlimited thickness of base metal,
- Have a minimum of six (6) months experience in welding tubular structures and

- Have demonstrated the ability to make uniform sound welds of the type required.

Submittals:

Prior to fabrication, the Contractor shall prepare and submit calculations and working drawings for the design, fabrication and erection of the prefabricated bridge superstructure for review in accordance with Article 1.05.02 and SubArticle 6.03.03-2. An individual, independently packaged set of working drawings and computations, with all details and documents necessary for fabrication and erection of the structure and its components, including a copy of the certificate of insurance, shall be prepared and submitted for the pedestrian bridge superstructure. The working drawings and computations shall be prepared in Customary U.S. units.

The packaged set of working drawings and computations for each bridge superstructure shall be submitted in an individual file in electronic portable document format (.pdf) with appropriate bookmarks and commenting enabled. The packaged set shall include the following:

- title sheet
- table of contents
- contact information for designer, fabricator and metallizer – contact information should include name and address of each firm and the name of contact person with phone number and email address
- copy of the certificate of insurance
- copy of fabricator's AISC certification
- pedestrian bridge working drawings
- pedestrian bridge design computations
- pedestrian bridge live load ratings, together with all electronic files, including intelligent files from load rating software used
- welding details and procedures
- fracture control plan
- bridge erection plans

The working drawings and design computations shall be **signed, dated and sealed** by a Professional Engineer licensed in the State of Connecticut, who shall also be available for consultation in interpreting his computations and drawings, and in the resolution of any problems which may occur during the performance of the work. Each working drawing shall be signed, dated and sealed. The cover/first sheet for the computations shall be signed, dated and sealed.

The electronic portable document format (.pdf) working drawings shall be created on ANSI D (22" x 34") full scale (1" electronic file = 1" paper) sheets. (The purpose of creating the drawings on ANSI D sheets is so that the sheets may be printed/plotted at that size or smaller without loss of legibility.) Each drawing shall have a border and title block. Located in the lower right hand corner of the drawing adjacent to the title block, each drawing shall have a rectangular box, 2 ¼" wide x 1 ¾" high, for the reviewers stamp. On the ANSI D full scale sheets, the minimum text height and width shall be 1/8". All letter characters shall be uppercase. The electronic files for the design computations, procedures and other supporting data shall be created on ANSI A (8 ½" x 11") letter sheets.

The Working Drawings shall include complete details of all pedestrian bridge superstructure components. The drawings shall include, but not be limited to the following:

- Project number, town and crossing with bridge identification number (Bridge No. or Site No. as applicable)
- Reference to the design specifications, including interim specifications
- Design criteria
- Material specifications for all components, including Charpy testing
- Non-destructive weld testing requirements
- Layout plan, Elevation View and Typical Bridge Section with Shipping length, width, height and weight of units to be transported
- Framing plan, showing trusses, locations and details of all connections and field splices, support beams, deck edge supports, lateral bracing and bearing plate details. The number of truss sections shall be minimized to reduce the amount of field splicing, but shall allow for the legal transportation of the sections being shipped.
- Identify all Fracture Critical Members (FCM's)
- Fabrication details, including member sizes, shear connectors, materials lists, etc.
- Dead load and permanent camber requirements
- Deck plan, sections and details
- QA/QC program of the plant manufacturing GFRP reinforcement.
- Railing details
- Erection Plan and details with lifting weights and attachment point locations (supplied by the fabricator) and complete erection sequence

The Bridge Erection Plan and Sequence shall include the following information for all stages of installation:

- The location and design capacity of temporary shoring towers
- The weight of each section of the superstructure handled during installation and the weight of the bridge on the towers
- Detailed installation procedure for all stages of installation that breaks down each stage into easy to follow steps.

- The capacity, position and orientation of all cranes, steerable trailers, mobile lifting equipment, delivery trucks, jacks, etc. used to move/assemble the superstructure sections.
- Crane charts
- Size and placement of crane mats to be used
- The limits of roadway closure and anticipated duration of each step of the installation procedure.
- Temporary staging layout including orientation of equipment required to make splice connections.

The Design Computations shall include all design information necessary to determine the structural adequacy of the bridge. Computations shall include, but not be limited to the following:

- The project number, town and bridge identification (crossing and Bridge No. or Site No.)
- References to design specifications, including interim specifications, and the applicable code section and articles
- Description/documentation for all computer programs used in the design
- Drawings/models of the structure, components and connections, with dimensions, loads and references to the local and global coordinate systems used (as applicable), to facilitate review of the results
- A tabulation of the section properties of the tubular members at each analyzed section. The tabulated values should include the dimensions of rectangular sections, wall thickness, inside bend radius, cross-sectional area, moment of inertia, section modulus, radius of gyration, and the effective length factor.
- Welded tubular connections
- Applied loads and conditions for all load combinations
- All resistance checks for axial, bending, and shear in each critical member type (i.e. top chord, bottom chord, vertical, floor beam, etc.)
- Data input and boundary conditions
- Coefficients and factors used in the design
- Results of all group loads and load combinations
- Truss and Floor Deflection Checks
- Horizontal and vertical deflections due to load combination Service I in Table 3.4.1-1 of AASHTO LRFD

- Results and Supplementary Calculations for all Stress & Deflection Analyses
- U-Frame stiffness check
- Live load ratings for the bridge. The live load ratings shall be prepared and submitted in accordance with the Connecticut Department of Transportation Bridge Load Rating Manual (CTDOT BLRM).
- The live load ratings shall be computed in accordance with the load and resistance factor rating (LRFR) method described in the AASHTO Manual for Bridge Evaluation (AASHTO MBE). The minimum live load rating factor shall be 1.2. Live loads used shall be those used in design, as specified in the LRFD Guide Specifications for the Design of Pedestrian Bridges. In the event of conflict between live load rating requirements and procedures outlined in the CTDOT BLRM with those of the AASHTO MBE, the Engineer will resolve the matter.
- Bolted splice connections (if applicable)
- Bearing plate analysis and elastomeric bearing pad design
- Critical weld connection check for each truss member type (i.e. vertical diagonal)
- Bridge reactions
- Expansion and contraction requirements and/or induced loads

The Contractor shall submit the packaged set of working drawings and calculations to the Engineer administering the project. The working drawings, design computations and live load ratings shall be sealed by a Professional Engineer licensed in the State of Connecticut, who shall also be available for consultation in interpreting his computations and drawings and in the resolution of any problems which may occur during the performance of the work. Please note that each working drawing must be sealed.

The reviewed and stamped working drawings and calculations will be returned to the Contractor, along with a recommendation regarding acceptance. Should the Engineer recommend resubmittal, the Contractor shall address the comments and resubmit the corrected package with a letter indicating the disposition of his responses to the comments. After the Engineer has reviewed the revised package and the responses, ensured all comments have been addressed satisfactorily and have found the submittal to be acceptable, a recommendation for acceptance may be sent to the Contractor. The Contractor shall supply up to 12 paper sets of the accepted drawings and any other part of the working drawing package that the District Construction office requests, at the scale requested, and deliver it to the Engineer. The paper sets shall be collated and bound.

The bridge superstructure shall be designed in accordance with the latest editions of the following specifications, including interim specifications: LRFD Guide Specifications for the Design of

Pedestrian Bridges (LRFD Guide), and the AASHTO LRFD Bridge Design Specifications (LRFD Specifications).

The superstructure shall be designed to carry the Design Loads listed in the plans and specification in combination with all other applicable loads in the AASHTO load groups.

Prior to fabrication of any material, the Contractor shall take all field measurements necessary for the design and fabrication of the superstructure. The Contractor shall confirm the line, grade and lengths of the proposed bridge.

#### Fabrication:

**Drain Holes:** When the collection of water inside a structural tube is a possibility, either during construction or during service, the tube shall be provided with a drain hole at its lowest point to let water out.

**Bolt Holes:** Unless otherwise specified, standard holes shall be used in high-strength bolted connections. Oversize holes may be used in any or all plies of slip-critical connections. They shall not be used in bearing-type connections. Cut, drill, mechanically thermal cut, or punch bolt holes perpendicular to metal surfaces. Do not enlarge bolt holes by burning.

**Bearing Holes/Slots:** Cut, drill, mechanically thermal cut, or punch bearing holes/slots perpendicular to steel surfaces.

#### Finishing:

**Blast Cleaning:** Shall be performed prior to galvanizing and painting.

- All Blast Cleaning shall use Best Management Practices and exercise environmentally friendly blast media recovery systems.
- Exposed surfaces of steel shall be defined as those surfaces seen from the deck and from outside of the structures. Stringers, floor beams, lower brace diagonals and the inside face of the truss below deck and bottom face of the bottom chord shall not be blasted.
- All finishing shall be completed in manufacturer's shop prior to shipping.

**Painting:** All exterior surfaces of steel shall be painted utilizing a 2-coat system. All exterior surfaces of steel shall be abrasively blast cleaned in accordance with SSPC-SP6 prior to application of the primer.

- Epoxy Midcoat
- Polyurethane Topcoat

Bridges shall be provided with paint for touch up after erection.

Paint color shall be approved by the Town of Bristol prior to fabrication.

Galvanizing: Proper drainage and venting shall be provided for the galvanization process. All structural steel shall be zinc coat (hot-dip) galvanized per the specifications listed in ASTM A123. Hardware shall be zinc coat (hot-dip) galvanized per the specifications listed in ASTM A153.

Delivery and Erection:

The prefabricated bridge superstructure shall not be shipped to the site until the Engineer has inspected the structure at the shop and the Engineer has authorized shipment. The structure shall be shipped with sufficient dunnage and shall be securely tied down in such a manner as to protect the structure and the coating from damage. Hauling permits and freight charges are the responsibility of the prefabricator.

The fabricator will notify the customer in advance of the expected arrival. Information regarding delays after the trucks depart the plant such as weather, delays in permits, re-routing by public agencies or other circumstances will be passed on to the customer as soon as possible but the expense of such unavoidable delays will not be accepted by the fabricator.

The Engineer will inspect the structure at the project site to determine if the structure has been damaged during transportation.

The superstructure supplier shall provide the services of an on-site technical advisor to instruct the Contractor in the proper method of handling and placement of the prefabricated bridge superstructure. The technical advisor shall remain on the site during the entire bridge erection operation and will be discharged of his/her services only at the Engineer's discretion. Installation of the bridge shall be performed and paid in accordance with these specifications.

The bridge fabricator shall provide written inspection and maintenance procedures to be followed by the bridge owner

Should the Contractor cause any damage to the roadway or its appurtenances, utilities above or below the roadway or other structures nearby, he shall be responsible to repair the damage or replace the damaged element at his own cost. Such repairs or replacement are subject to prior approval by the Engineer.

The prefabricated pedestrian bridge may be delivered to the job site in sections with measurements and weights as depicted on the plans and accepted Working Drawing submittal.

Fabrication and construction of the pedestrian bridge superstructure shall conform to the Standard Form 819, Article 6.03.03.

The minimum vertical and horizontal clearances for operating equipment under and adjacent to overhead utility lines shall be in accordance with the current State of Connecticut & OSHA Regulations. Deviations, including power outages, require prior written approval from the utility owner.

After the concrete in the abutment stem reaches the minimum compressive strength as determined by the pedestrian bridge designer, the bridge superstructure may be installed on the abutment stem as shown on the plans and in accordance with the approved working drawings. The Contractor shall adhere to the project traffic control plans, maintenance and protection of traffic and prosecution and progress specifications. Sections of the superstructure will be erected in their final positions and connected using bolted splices provided by the superstructure fabricator. Installation of the superstructure shall be completed in accordance with a detailed Bridge Erection Plan and Sequence submitted to and accepted by the Engineer a minimum of 60 calendar days before the scheduled installation date of the superstructure.

The deck shall be constructed with edge supports beneath the deck as part of the structural steel framing.

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

**Basis of Payment:** This work will be paid for at the lump sum price for “Pedestrian Bridge”, complete and accepted, which price shall include all materials, equipment, tools and labor incidental to the design, fabrication, construction, delivery, handling, and unloading of the prefabricated bridge superstructure, including anchor bolts and bearings as required, at the location shown on the plans.

Pay Item

Pedestrian Bridge

Pay Unit

L.S.

## **ITEM #0819002A - PENETRATING SEALER PROTECTIVE COMPOUND**

**Description:** Work under this item shall consist of cleaning concrete surfaces of dirt, dust, and debris, and furnishing and applying a clear, penetrating sealer to concrete surfaces where shown on the plans, to provide a barrier against the intrusion of moisture and chlorides. This work also includes furnishing, installing, and removing platforms, scaffolding, ladders, and other means of access as well as shields, as required, to protect adjacent areas and traffic from overspray.

**Materials:** The penetrating sealer shall conform to Article M.03.09. A Materials Certificate shall be submitted for the penetrating sealer in accordance with Article 1.06.07. A product not listed on the Qualified Products List (QPL) may be considered for approval. A Certified Test Report shall be submitted in accordance with Article 1.06.07 indicating that the product being considered conforms to the Test Requirements listed on the QPL.

### **Construction Methods:**

**Submittals:** The Contractor shall submit to the Engineer Safety Data Sheets (SDS), Technical Data Sheets and product literature for the approved sealer. The literature shall include written instructions how to apply the sealer to vertical and horizontal surfaces, and where required, overhead surfaces. Application rate and number of applications of sealer shall be addressed.

The Contractor shall submit to the Engineer, in accordance with Article 1.05.02, written procedures for cleaning the concrete surfaces prior to sealer application. The submittal shall include proposed equipment and materials and shall address how adjacent traffic and other areas shall be protected from dust, debris and overspray during the cleaning and application processes. Where the sealer is to be applied to parapets before pavement is placed, the submittal shall address protection of the deck and curb to which membrane waterproofing will be applied. Should the membrane already be present, the submittal shall address shielding of the membrane. It shall also indicate how vegetation and regulated areas shall be protected from overspray. The submittal shall address the conditions under which work may proceed, including wind speed, temperature and precipitation. It shall also include procedures to be followed to protect the work should unfavorable weather conditions occur before the product has been absorbed.

The Contractor shall inspect the surfaces to be sealed to identify surface cleaning needs before submitting the procedures. The Contractor shall identify concrete surfaces that:

- Need repair
- Require special attention or cleaning procedures
- Have been previously treated with coatings or curing compounds that would hinder penetration of the sealer into the concrete
- Will be new or newly repaired

Written procedures shall include observations listed above. Application of penetrating sealer to new concrete shall be addressed in the application procedures. Forms for surfaces of new concrete to receive penetrating sealer shall not be treated using form release oil, which can inhibit or prevent penetration of the sealer into the concrete.

**Surface Preparation:** Concrete surfaces to which penetrating sealer will be applied shall be clean and free of grease, oil, and other surface contaminants, including biological growth. Dry surfaces may be cleaned by sweeping with brushes or brooms, and blowing clean with oil-free, compressed air. The Contractor shall take care not to damage the concrete surface finish during cleaning operations. Care shall be taken so that cleaning methods do not damage joint sealant or other components of the structure that are to remain.

**Application:** Application of the sealer may begin only after the Engineer evaluates the concrete surfaces and determines that conditions for installation comply with the accepted written application procedures.

The sealer shall be applied in accordance with the accepted application procedures at the rate specified by the manufacturer. The Contractor shall monitor and record the number of square feet of concrete surface sealed and the number of gallons of sealer applied over that surface area to verify that the required application rate is being met. A minimum of three applications of sealer shall be assumed to be needed. After the first application of the sealer, curing time shall be recorded and submitted to the Engineer. Additional applications of sealer shall be applied as specified in the application instructions, provided adequate time between applications and appropriate curing of the sealer have occurred. For each application, the Contractor shall record the area and number of gallons of sealer applied as well as the curing time for that application. The Contractor may be directed to apply sealer in up to three separate applications if concrete surfaces readily absorb the previous application.

If the Contractor is directed to apply more than three applications of sealer, the additional applications will be compensated as extra work. Should salts, oil or other visually undesirable materials be evacuated from the concrete by the penetrating sealer and remain on the surface after sufficient rain events have occurred, the Engineer may order surface cleaning of the concrete as extra work.

The Engineer shall be provided access to inspect the concrete surface during application and after the sealer has had adequate time to cure.

**Method of Measurement:** This work will be measured for payment by the actual number of square yards of concrete, sealed and accepted, within the designated limits. The area will be measured once, regardless of the number of applications required.

**Basis of Payment:** This work will be paid for at the Contract unit price per square yard for "Penetrating Sealer Protective Compound," complete, which price shall include all equipment tools, labor and materials, incidental thereto, including the preparation of the concrete surfaces and proper disposal of debris.

The following are not included in the cost of this item and will be considered Extra Work:

- Special cleaning procedures ordered by the Engineer to properly prepare the concrete surface for application of the penetrating sealer (such as removal of tightly adherent biological growth, graffiti, or other difficult-to-remove surface contaminants)

- Additional applications of sealer as noted in the Construction Methods
- Cleaning of evacuated material from sealed surfaces as ordered by the Engineer.

Pay Item	Pay Unit
Penetrating Sealer Protective Compound	s.y.

**ITEM #0913992A – DECORATIVE FENCE**

**Description:** This item shall consist of furnishing and installing a decorative fence which shall be made of a Three Rail Wood fence. This fence is located by the pedestrian bridge and runs along the north side of the bituminous walk between Station 46+08 and Station 46+56 left on Shrub Road. This item shall also include all the incidentals necessary to complete the work in the location, at the grades, and to the dimensions and details shown on the Plans.

**Materials:**

The following specifications, derived from ASTM F537 and Standard Practice in the Fence Industry, shall apply to the materials and construction of wood fences:

1. All post shall be of Cedar and be a minimum of 5” in diameter.
2. All rails shall be of Cedar and be a minimum of 4” in diameter.

**Construction Methods:**

1. Post spacing shall not exceed eight feet (8').
2. Post shall extend four feet (4') high above the ground.
3. Post holes should be eighteen inches (18”) in diameter and minimum (36”) deep. The bottom eighteen inches (18”) shall be backed fill with impervious fill and stone dust while the top eighteen inches (18”) will extend down through riprap slope protection.
4. Fences shall be three cedar rails spaced twelve inches (12”) apart and doweled into the post two inches (2”)

**Method of Measurement:**

This work shall be paid for on the linear foot of decorative fence installed and accepted by the City of Bristol. Riprap will be measured separately and shall be paid for under the Item #0703011 “Intermediate Riprap”.

**Basis of Payment:** This work shall be paid for at the Contract price for linear foot of “Decorative Fence,” complete in place. The price shall also include all materials, equipment, tools, and labor incidental thereto. Riprap will be measured separately and shall be paid for under the Item #0703011 “Intermediate Riprap”.

Pay Item  
Decorative Fence

Pay Unit  
L.F.

**ITEM #0950019A – TURF ESTABLISHMENT - LAWN**

**Description:** The work included in this item shall consist of providing an accepted stand of grass by furnishing and placing seed as shown on the plans or as directed by the Engineer.

**Materials:** The materials for this work shall conform to the requirements of Section 9.50 of Standard Specification Form 818. The following mix shall be used for this item:

**Turf Seed Mix:**

In order to preserve and enhance the diversity, the source for seed mixtures shall be locally obtained within the Northeast USA including New England, New York, Pennsylvania, New Jersey, Delaware, or Maryland. All seed mixtures must be submitted for approval by the Landscape Design Office and include the name of the Varieties for each species, in similar percentages. Product certifications shall include the minimum germination rates as follows: 75% for Bluegrass, and 85% for both Fescues and Ryegrass species.

<b><u>Species Percent</u></b>	<b><u>Common name (Improved Variety)</u></b>	<b><u>Scientific name</u></b>
15	Kentucky Bluegrass	Poa pratensis
15	Kentucky Bluegrass	Poa pratensis
30	Red Fescue	Festuca rubra
30	Chewing Fescue	Festuca rubra
20	Ryegrass	Lolium perenne

**Construction Methods:** Construction Methods shall be those established as agronomically acceptable and feasible and that are approved by the Engineer. Rate of application shall be field determined in Pure Live Seed (PLS) based on the minimum purity and minimum germination of the seed obtained. Calculate the PLS for each seed species in the mix. Adjust the seeding rate for the above composite mix, based on 250 lbs. per acre. The seed shall be mulched in accordance with Article 9.50.03.

**Method of Measurement:** This work will be measured for payment by the number of square yards of surface area of accepted established grasses as specified or by the number of square yards (square meters) of surface area of seeding actually covered and as specified.

**Basis of Payment:** This work will be paid for at the contract unit price per square yard for “Turf Establishment - Lawn” which price shall include all materials maintenance, equipment, tools, labor, and work incidental thereto. Partial payment of up to 60% may be made for work completed, but not accepted. Final acceptance requires the visual inspection of a minimum of 60% total coverage of healthy green vegetation per square foot of area.

Pay Item	Pay Unit
Turf Establishment - Lawn	s.y.

**ITEM #0969060A - CONSTRUCTION FIELD OFFICE, SMALL**

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

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

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

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

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

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

- A. Each work area (or cubicle) shall be a minimum of 8 feet 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).
- B. Only one user (workstation/desk) per work area.
- C. Desks, tables, and other work surfaces shall be arranged so that adjacent users do not face each other.

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

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

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

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

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

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

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

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

- I. Prior to field office removal, the CTDOT Office of Information Systems (CTDOT OIS) must be notified to deactivate the communications equipment.

Heating, Ventilation and Air Conditioning (HVAC): The field office shall be equipped with sufficient and properly operating, heating, air conditioning, and ventilation equipment to maintain a temperature range of 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.

The Contractor shall provide the field office telephone number(s) to the CTDOT Project Engineer within 10 calendar days after the signing of the Contract as required by Article 1.08.02.

Data Communications Facility Wiring: As soon as the field office is in place, the Contractor shall propose a central wiring location, to designated CTDOT District personnel for the review and approval of CTDOT OIS. The central wiring location shall be large enough to house the Contractor supplied modem, Contractor supplied patch panel (if applicable), and CTDOT OIS supplied LAN switch and router. The Contractor shall supply the number of Category 6A 568B patch panels necessary to support the anticipated number of networked devices. The central wiring location shall also house the data circuit with appropriate power requirements and Category 6A cable run to the location of the installed data circuit. Power shall be provided at the central wiring location to power the hardware installed.

The Contractor shall install CAT 6A cables from the central wiring location to each workstation, Smart Board/TV location, Multifunction Laser Printer/Copier/Scanner and any other networked devices. The CAT 6A cables shall terminate in a (Category 6A 568B) wall or surface mount data jack at each networked device. Each run / jack shall be clearly labeled with an identifying Jack Number. The CAT 6A cables shall be terminated at the central wiring location with a service loop and RJ45 connectors. The Contractor shall also supply CAT6A cables of adequate length to reach from the wall or surface mount jack to the device being networked.

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

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

Furnishing Description	Office Size			
	Small	Med.	Large	Extra Large
	Quantity			
Office desk (2.5 ft. x 5 ft.) with drawers, locks, and matching desk chair that have pneumatic seat height adjustment and dual wheel casters on the base.	1	3	5	8
Standard secretarial type desk and matching desk chair that has pneumatic seat height adjustment and dual wheel casters on the base.	-	-	-	1
Personal computer tables (4 ft. x 2.5 ft.).	2	3	5	8
Drafting type tables (3 ft. x 6 ft.) and supported by wall brackets and legs; and matching drafter's stool that have pneumatic seat height adjustment, seat back and dual wheel casters on the base.	1	1	1	2
Conference table, 3 ft. x 12 ft.	-	-	-	1
Table – 3 ft. x 6 ft.	-	-	-	1
Office Chairs.	2	4	8	20
Mail slot bin – legal size.	-	-	1	1
Non-fire-resistant cabinet.	-	-	2	4
Fire resistant cabinet (legal size/4 drawer), locking.	1	1	2	3
Storage racks to hold 3 ft. x 5 ft. display charts.	-	-	1	2
Vertical plan racks for 2 sets of 2 ft. x 3 ft. plans for each rack.	1	1	2	2
Double door supply cabinet with 4 shelves and a lock – 6 ft. x 4 ft.	-	-	1	2
Case of cardboard banker boxes (Min 10 boxes/case)	1	1	2	3
Open bookcase – 3 shelves – 3 ft. long.	-	-	2	2
White Dry-Erase Board, 36" x 48" min. with markers and eraser.	1	1	1	1
Interior partitions – 6 ft. x 6 ft., soundproof type, portable and freestanding.	-	-	6	6
Coat rack with 20 coat capacity.	-	-	-	1
Wastebaskets - 30 gal., including plastic waste bags.	1	1	1	2
Wastebaskets - 5 gal., including plastic waste bags.	1	3	6	10
Electric wall clock.	-	-	-	2
Electronic Level	1	1	1	2

Furnishing Description (continued)	Office Size			
	Small	Med.	Large	Extra Large
	Quantity			
Telephone.	1	2	3	-
Full size stapler 20 (sheet capacity, with staples)	1	2	5	8
Desktop tape dispensers (with Tape)	1	2	5	8
8 Outlet Power Strip with Surge Protection	3	4	6	9
Rain Gauge	1	1	1	1
Business telephone system for three lines with ten handsets, intercom capability, and one speaker phone for conference table.	-	-	-	1
Mini refrigerator - 3.2 c.f. min.	1	1	1	1
Hot and cold-water dispensing unit. Disposable cups and bottled water shall be supplied by the Contractor for the duration of the project.	1	1	1	1
Microwave, 1.2 c.f., 1000W min.	1	1	1	1
Fire extinguishers - provide and install type and *number to meet applicable State and local codes for size of office indicated, including a fire extinguisher suitable for use on a computer terminal fire.	*	*	*	*
Electric pencil sharpeners.	1	2	2	2
Multi-Function Laser Printer/Copier/Scanner combination unit, network capable, as specified below under <u>Field Office Technology</u>	1	1	1	1
Field Office Internet Service and Hardware 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 internet service connection, Contractor supplied modem, associated hardware, Digital Camera(s), Smart Phones, Multifunction Laser Printer/Copier/Scanner, Conference Room Teleconferencing Equipment, associated hardware and software meeting the requirements of this specification, as well as the latest minimum specifications posted, as of the Project advertising date, at CTDOTs [Construction Field Office Technology](#) web site.

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

The Contractor and/or their internet service provider shall be responsible for the installation, setup of the internet service connection and the configuration of the modem with a static IP address. Installation shall be coordinated with CTDOT District and Project personnel. Specifically, the Contractor shall supply the District with a Static IP Address, Subnet Mask Address and Gateway Address immediately upon establishment of internet service connection to assist with OIS equipment installation.

After the approval of the hardware and software, the Contractor shall contact the designated representatives of the CTDOT administering District, a minimum of 2 working days in advance of the proposed delivery or installation of the modem / Internet Service Connection, Digital Camera(s), Smart Phones, Multifunction Laser Printer/Copier/Scanner, Teleconferencing Equipment, as well as associated hardware, software, supplies, and support documentation. The hardware and cabling shall be installed in the field office to and at locations acceptable to the Engineer. Adequate electric service shall be supplied at all hardware and workstation locations to support the Department staff and hardware specified.

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

Once the Contract has been completed, the Contractor supplied hardware and software will remain the property of the Contractor.

First Aid Kit: The Contractor shall supply a first aid kit adequate for the number of personnel expected based on the size of the field office specified and shall keep the first aid kit stocked for the duration that the field office is in service.

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

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

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

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

- A. Concrete Cylinder Curing Box – meeting the requirements of Section 6.12 of the Standard Specifications.
- B. Air Meter – The air meter provided shall be in good working order and meet the requirements of AASHTO T 152.
- C. Slump Cone Mold – Slump cone, base plate, and tamping rod shall be provided in like-new condition and meet the requirements of AASHTO T 119, Standard Test Method for Slump of Hydraulic-Cement Concrete.
- D. T-handle concrete cylinder mold splitter.

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

Insurance Policy: The Contractor shall provide a separate insurance policy, with no deductible, in the minimum amount of five thousand dollars (\$5,000) to insure all State-owned data equipment and supplies used in the office against all losses. The Contractor shall be named insured on that policy, and the CTDOT shall be an additional named insured on the policy. Insured losses shall include, but not be limited to, theft, fire, and physical damage. The CTDOT will be responsible for all

maintenance costs of CTDOT owned computer hardware. In the event of loss, the Contractor shall provide replacement equipment in accordance with current CTDOT equipment specifications, within seven days of notice of the loss. If the Contractor is unable to provide the required replacement equipment within seven days, CTDOT may provide replacement equipment and deduct the cost of the equipment from monies due or which may become due the Contractor under the Contract or under any other contract. The Contractor's financial liability under this paragraph shall be limited to the amount of the insurance coverage required by this paragraph. If the cost of equipment replacement required by this paragraph should exceed the required amount of the insurance coverage, CTDOT will reimburse the Contractor for replacement costs exceeding the amount of the required coverage.

**Maintenance:** During field office occupancy by CTDOT, the Contractor shall maintain all facilities and furnishings provided under the above requirements, and shall maintain and keep the office quarters clean through the use of professional cleaning including vacuuming carpet, washing and waxing floors, cleaning restrooms, removal of trash, general cleaning, etc.

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

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

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

**Basis of Payment:** The furnishing and maintenance of the Construction Field Office will be paid for at the Contract unit price per month for "Construction Field Office, (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, Small	Month

## **ITEM NO. 0971001A – MAINTENANCE AND PROTECTION OF TRAFFIC**

### **Article 9.71.01 – Description** *is supplemented by the following:*

The Contractor shall maintain and protect traffic as described by the following and as limited in the special provision for Section 1.08 - Prosecution and Progress:

#### **Shrub Road & Jerome Avenue**

The Contractor shall maintain and protect a minimum of 1 lane of traffic in each direction with each lane on a paved travel path not less than 10 feet in width, with the following exceptions:

1. During the allowable periods and when the Contractor is actively working, the Contractor will be permitted to maintain and protect at least an alternating one-way traffic operation on a paved travel path not less than 10 feet in width and no more than 300 feet in length, unless specified elsewhere in the Contract. There shall be no more than one alternating one-way traffic operation within the Project limits without prior approval of the Engineer.

#### **Commercial and Residential Driveways**

The Contractor shall maintain access to and egress from all commercial and residential driveways throughout the Project limits. The Contractor will be permitted to temporarily close affected driveways while actively working with coordination and permission from the owner or proprietor.

#### **Blasting Operation**

There is no blasting allowed on this site.

#### **Intermediate Term Sidewalk Closures**

There are presently no Sidewalks on Shrub Road and Jerome Avenue. What little Pedestrian Traffic present on Shrub Road has been using the edge of the road or the graded area off the edge of the pavement. Once sections of sidewalk are constructed and the sidewalk construction has moved down the road the Contractor may allow pedestrian traffic on those portions of the sidewalk that are installed and grading is complete. There will be no pedestrian detour installed to go around the portion of sidewalk being constructed. All approaches to the sidewalk shall be blocked by Construction Barricade Detectable with Sidewalk Closed signs.

#### **Pedestrians:**

There are presently no Sidewalks on Shrub Road and Jerome Avenue. What little Pedestrian Traffic presently on Shrub Road has been using the edge of the road or the graded area off the edge of the pavement.

### **Article 9.71.03 - Construction Methods** *is supplemented as follows:*

## **General**

This is not a full depth full road reconstruction project. Only small sections of about  $\pm 2$  feet road widening on the shoulder is being constructed. This will result in some drainage structures being relocated to meet the new edge of road.

The Contractor is required to delineate any raised structures within the travel lanes, so that the structures are visible day and night, unless there are specific Contract plans and provisions to temporarily lower these structures prior to the completion of work.

When the Contractor is excavating adjacent to the roadway, the Contractor shall provide a 3 foot shoulder between the work area and travel lanes, with traffic drums spaced every 50 feet. At the end of the work shift if the vertical drop-off exceeds 3 inches, the Contractor shall provide a temporary bituminous concrete traversable slope of 4:1 or flatter that is acceptable to the Engineer.

When an existing sign is to be relocated or replaced, the work shall be completed during the same work shift.

The field installation of a signing pattern shall constitute interference with existing traffic operations and shall not be allowed, except during the allowable periods.

## **Existing Signing**

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

## **Requirements for Winter**

The Contractor shall schedule a meeting with representatives of the City of Bristol, to determine any interim traffic control measures the Contractor shall accomplish prior to winter to provide safety to motorists and permit adequate snow removal procedures. This meeting shall be held prior to October 31 of each year and will include, but not be limited to, discussion of the status and schedule of the following items: lane and shoulder widths, pavement restoration, pavement markings, and signing.

## **Signing Patterns**

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

### **Pavement Markings - Non-Limited Access 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.

All temporary pavement markings exposed throughout the winter shall be Epoxy Resin Pavement Markings, unless directed otherwise by the Engineer.

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

### **Final Pavement Markings**

Refer to Pavement Marking Groove special provisions for pavement marking requirements. 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.

Construction Traffic Control Plans 19 through 25 should be used for moving operations such as line striping, rumble strips, pothole patching, mowing, or sweeping when it is necessary for equipment to occupy a travel lane.

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 City of Bristol, Municipal Police, and the Contractor (Project Superintendent) 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 City of Bristol Engineer. 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. Review special concern areas: ramps, turning roadways, medians, lane drops, etc.;
  - 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 (TMAs, Arrow Board, Changeable Message Sign(s), 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 District Office 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) Additional devices are required on intersecting roads to warn and/or move traffic into the proper travel path prior to merging with or exiting from the mainline traffic. This shall be completed before installing the mainline pattern past the intersecting roadway.
- 3.f) Workers are prohibited from crossing the travel lanes on limited access roadways to install and remove signs or other devices on the opposite side of the roadway. Any signs or devices on the opposite side of the roadway shall be installed and removed separately.

### **4. Implementation of Rolling Road Block (RRB)**

- 4.a) Temporary road closures using a RRB may be allowed on limited access highways for operations associated with the installation and removal of temporary lane closures. RRB may be allowed for the installation and removal of lead signs and lane tapers only and shall meet the following requirements:
  - i. Refer to the Limitation of Operations Chart provided in Section 1.08.04 for the hours allowed for implementing a RRB operation. The Contractor shall only implement a RRB operation within the hours shown in the Chart.
  - ii. In areas with good sight lines and full shoulders, signs on the side of the road opposite the traffic pattern should be installed in a separate operation.

- iii. TMAs equipped with Arrow Boards shall be used to slow traffic to implement the RRB. State Police Officers in marked vehicles may be used to support the implementation of the RRB. The RRB shall start by having all vehicles, including TMAs and police vehicles, leave the shoulder or on-ramp and accelerate to normal roadway speeds in each lane. The vehicles will then position themselves side by side and decelerate to the RRB speed on the highway.
- iv. A Pre-Warning Vehicle, as specified elsewhere in the Contract, shall be used to advise the motorists that sign pattern installation or removal is underway.
- v. The RRB duration shall not exceed 15 minutes from the start of the traffic block until all lanes are opened as designated in the Limitation of Operations chart. If the RRB duration exceeds 15 minutes on 2 successive shifts, no further RRB will be allowed until the Contractor obtains approval for a revised installation procedure from the District.
- vi. RRB shall not be used to expand a lane closure pattern to an additional lane during the shift. The workers and equipment required to implement the additional lane closure should be staged from within the closed lane. TMAs (and State Police if available) shall be used to protect the workers installing the taper in the additional lane.
- vii. Exceptions to these work procedures may be submitted to the City of Bristol Engineer for consideration. A minimum of 2 business days shall be allowed for review and comment by the City of Bristol.
- viii. The Engineer and the Contractor will review and discuss the RRB procedures (including any revisions) in advance of the work. The implementation of the agreed upon plan will be reviewed with the Municipal Police during the Work Zone Safety Meeting held before each shift involving temporary lane closures. If the Municipal Police determine that alternative procedures should be implemented for traffic control during the work shift, the City of Bristol Engineer and Contractor will attempt to resolve any discrepancies with the Municipal Police. If the discrepancies are unable to be resolved prior to the start of the shift, then the work will proceed as recommended by the City of Bristol Engineer. Any unresolved issues shall be addressed the following day.

## **5. Use of Arrow Boards**

- 5.a) On non-limited access roadways, the use of an Arrow Board for lane closures is optional. The roadway geometry, sight distance, and traffic volume shall be considered in the decision to use the Arrow Board.
- 5.b) A vehicle displaying an arrow board shall be equipped with high-intensity rotating, flashing, oscillating, or strobe lights.
- 5.c) The flashing arrow mode shall be used for lane closure (merge) tapers.
- 5.d) The flashing arrow mode shall not be used for temporary alternating one-way traffic operations or to laterally shift lanes of traffic.

- 5.e) The flashing double arrow mode shall only be used for closing a center lane on a multilane roadway where adjacent left and right lanes remain open.
- 5.f) For shoulder work or roadside work near the shoulder, the Arrow Board shall be positioned in the shoulder and the flashing alternating diamond mode should be used.
- 5.h) The flashing alternating diamond caution mode should also be used when supplemental Arrow Boards are positioned in an already closed lane.

#### **6. Use of Truck-Mounted or Trailer-Mounted Impact Attenuators (TMAs)**

- 6.a) On limited access roadways, lane closures shall use a minimum of two TMAs to install and remove traffic control patterns. If two TMAs are not available, then the pattern shall not be installed.
- 6.b) On non-limited access roadways, the use of TMAs to install and remove patterns closing a lane(s) is optional. The roadway geometry, sight line distance, and traffic volume shall be considered in the decision to utilize the TMAs.
- 6.c) On limited access roadways, one TMA shall be placed on the shoulder and the second TMA shall be approximately 1,000 feet ahead blocking the lane to establish the advance and transition signing. The Arrow Board mounted on the TMA shall be in the arrow mode when taking the lane. The sign truck and workers shall be at sufficient distance ahead of the second TMA. In no case shall the TMA be used as the sign truck or a work truck. Once the transition is in place, the TMAs shall travel in the closed lane until all Portable Changeable Message Signs, signs, Arrow Boards, and cones/drums are installed. The Arrow Board mounted on the TMA should be in the flashing alternating diamond caution mode when traveling in the closed lane.
- 6.d) A TMA shall be placed prior to the first work area in the pattern. If there are multiple work areas within the same pattern, then additional TMAs shall be positioned at each additional work area as needed. The Arrow Board mounted on the TMA should be in the flashing alternating diamond caution mode when in the closed lane.
- 6.e) TMAs shall be positioned a sufficient distance prior to the workers or equipment being protected to allow for appropriate vehicle roll-ahead in the event that the TMA is hit, but not so far that an errant vehicle could travel around the TMA and into the work area. For additional placement and use details, refer to Section 18.06. Some operations, such as paving and concrete repairs, do not allow for placement of the TMA(s) within the specified distances. In these situations, the TMA(s) shall be placed at the beginning of the work area and shall be advanced as the paving or concrete operations proceed.
- 6.f) TMAs will be paid for in accordance with how the unit is used. If it is used as a TMA and is in the proper location as specified, then it will be paid for at the specified hourly rate for

Truck-Mounted or Trailer-Mounted Impact Attenuator. When the TMA is used as an Arrow Board, it will be paid for at the daily rate for Arrow Board. If a TMA is used to install and remove a pattern and is also used as an Arrow Board in the same day, then the unit will be paid for as a Truck-Mounted or Trailer-Mounted Impact Attenuator for the hours used to install and remove the pattern, typically 2 hours (1 hour to install and 1 hour to remove). If the TMA is also used as an Arrow Board during the same day, then the unit will only be paid for at the daily rate as an Arrow Board.

## **7. Use of Traffic Drums and Traffic Cones**

- 7.a) On limited-access highways, ramps, and turning roadways:
- i. Traffic drums shall be used for taper channelization.
  - ii. Traffic drums shall be used to delineate raised catch basins and other hazards.
  - iii. Traffic cones with a minimum height of 42 inches may be used in place of drums in the tangent section of a closed lane or shoulder.
  - iv. Traffic cones less than 42 inches in height shall not be used.
- 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.
- c) Type B Barricade Warning Lights shall be used on post-mounted advanced warning signs.

## **9. Use of Portable Changeable Message Signs (PCMS)**

- 9.a) On non-limited access roadways, the use of PCMS for lane closures is optional. The roadway geometry, sight line distance, and traffic volume shall be considered in the decision to use the PCMS.

- 9.b) PCMS should be placed off the shoulder of the roadway and behind a traffic barrier, if practical. Where a traffic barrier is not available to shield the PCMS, it should be placed off the shoulder and outside of the clear zone. If a PCMS has to be placed on the shoulder of the roadway or within the clear zone, it should be placed on the paved shoulder with a minimum of five traffic drums placed in a taper in front of it to delineate its position. The taper shall meet minimum distance requirements for a shoulder closure. The PCMS shall be protected if it is used for a continuous duration of 36 hours or more.
- 9.d) The PCMS shall be removed from the clear zone and have the display screen cleared and turned 90 degrees away from the roadway when the PCMS is no longer required.
- 9.e) The PCMS should not be used within 1,000 feet of an existing PCMS or Variable Message Sign (VMS).
- 9.f) A PCMS message shall:
  - i. consist of no more than two phases;
  - ii. contain no more than three lines of text per phase;
  - iii. have no more than eight characters per line, including spaces.
- 9.g) The PCMS should be used for specific situations that need to command the motorist's attention which cannot be conveyed with standard construction signs. The PCMS should not be used for generic messages (ex.: Road Work Ahead, Bump Ahead, Gravel Road, etc.) or for messages that need to be displayed for long periods of time, such as during stage construction. These types of messages should be displayed with construction signs. Special signs shall be coordinated with the Office of Construction and the Division of Traffic Engineering for the proper layout/dimensions required.
- 9.h) Typical messages that are allowed on the PCMS are shown below. Approval must be received from the City of Bristol Engineer different than the typical messages shown in Figure 1.
- 9.i) All messages shall comply with the information provided in Tables 2 and 3.

<u>Message No.</u>	<u>Phase 1</u>	<u>Phase 2</u>	<u>Message No.</u>	<u>Phase 1</u>	<u>Phase 2</u>
1	LEFT LANE CLOSED	MERGE RIGHT	9	LANES CLOSED AHEAD	REDUCE SPEED
2	2 LEFT LANES CLOSED	MERGE RIGHT	10	LANES CLOSED AHEAD	USE CAUTION
3	LEFT LANE CLOSED	REDUCE SPEED	11	EXIT XX CLOSED	USE EXIT YY
4	2 LEFT LANES CLOSED	REDUCE SPEED	12	EXIT XX CLOSED USE YY	FOLLOW DETOUR
5	RIGHT LANE CLOSED	MERGE LEFT	13	2 LANES SHIFT AHEAD	USE CAUTION
6	2 RIGHT LANES CLOSED	MERGE LEFT	14	3 LANES SHIFT AHEAD	USE CAUTION
7	RIGHT LANE CLOSED	REDUCE SPEED			
8	2 RIGHT LANES CLOSED	REDUCE SPEED			

**Figure 1: Typical PCMS Messages**

**Table 2: Acceptable Abbreviations**

<b>Word Message</b>	<b>Standard Abbreviation</b>	<b>Word Message</b>	<b>Standard Abbreviation</b>
Access	ACCS	Minimum	MIN
Afternoon / Evening	PM	Minor	MNR
Ahead	AHD	Minute(s)	MIN
Alternate	ALT	Monday	MON
Avenue	AVE, AV	Morning / Late Night	AM
Bicycle	BIKE	Mount	MT
Blocked	BLKD	Mountain	MTN
Boulevard	BLVD	National	NATL
Bridge	BR	Normal	NORM
CB Radio	CB	North	N
Center	CTR	Northbound	NBND
Center	CNTR	Oversized	OVRSZ
Chemical	CHEM	Parking	PKING
Circle	CIR	Parkway	PKWY
Compressed Natural Gas	CNG	Pavement	PVMT
Condition	COND	Pedestrian	PED
Congested	CONG	Place	PL
Construction	CONST	Pounds	LBS
Court	CT	Prepare	PREP
Crossing	XING	Quality	QLTY
Crossing (other than highway-rail)	XING	Right	RT
Downtown	DWNTN	Road	RD
Drive	DR	Roadwork	RDWK
East	E	Route	RT, RTE
Eastbound	EBND	Saint	ST
Electric Vehicle	EV	Saturday	SAT
Emergency	EMER	Service	SERV
Entrance, Enter	ENT	Shoulder	SHLDR
Exit	EX	Slippery	SLIP
Express	EXP	South	S
Expressway	EXPWY	Southbound	SBND
Feet	FT	Speed	SPD
Freeway	FRWY, FWY	State, county, or other non-US or non-Interstate numbered route	[Route Abbreviation determined by highway agency]**
Friday	FRI	Street	ST
Frontage	FRNTG	Sunday	SUN
Hazardous	HAZ	Telephone	PHONE
Hazardous Material	HAZMAT	Temporary	TEMP
High Occupancy Vehicle	HOV	Terrace	TER

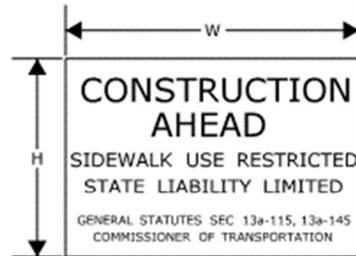
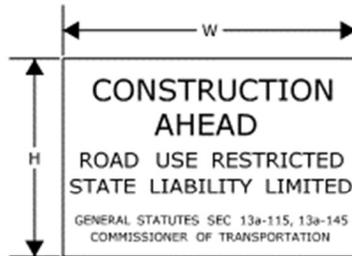
Highway	HWY	Thruway	THWY
Highway-Rail Grade Crossing	RR XING	Thursday	THURS
Hospital	HOSP	Tons of Weight	T
Hour(s)	HR, HRS	Traffic	TRAF
Information	INFO	Trail	TR
International	INTL	Travelers	TRVLRS
Interstate	I-	Tuesday	TUES
Junction / Intersection	JCT	Turnpike	TPK
Lane	LN	Two-Way Intersection	2-WAY
Left	LFT	Two-Wheeled Vehicles	CYCLES
Liquid Propane Gas	LP-GAS	Upper	UPR
Local	LOC	US Numbered Route	US
Lower	LWR	Vehicle(s)	VEH, VEHS
Maintenance	MAINT	Warning	WARN
Major	MAJ	Wednesday	WED
Maximum	MAX	West	W
Mile(s)	MI	Westbound	WBND
Miles Per Hour	MPH		

\*\* A space and no dash shall be placed between the abbreviation and the number of the route.

**Table 3: Unacceptable Abbreviations**

<b>Unacceptable Abbreviation</b>	<b>Intended Word</b>	<b>Common Misinterpretation</b>
ACC	Accident	Access (Road)
CLRS	Clears	Colors
DLY	Delay	Daily
FDR	Feeder	Federal
L	Left	Lane (Merge)
LT	Light (Traffic)	Left
PARK	Parking	Park
POLL	Pollution (Index)	Poll
RED	Reduce	Red
STAD	Stadium	Standard
WRNG	Warning	Wrong

## SERIES 16 SIGNS



		W	H
16-E	80-1605	84"	x 60"
16-H	80-1608	60"	x 42"
16-M	80-1613	30"	x 24"

		W	H
16-S	80-1619	48"	x 30"

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

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

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

SIGN 16-E SHALL BE USED ON ALL FREEWAYS AND EXPRESSWAYS.

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

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

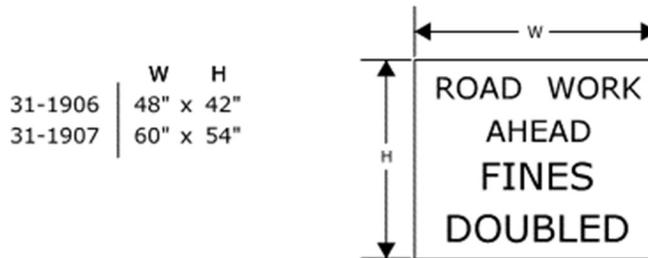
CONSTRUCTION TRAFFIC CONTROL PLAN  
**SERIES 16 SIGNS**

SCALE: NONE

## REGULATORY SIGN "ROAD WORK AHEAD, FINES DOUBLED"

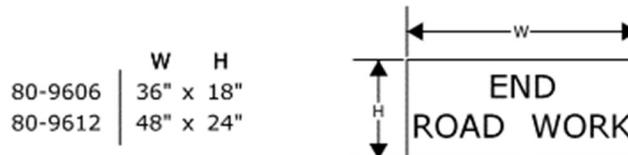
THE REGULATORY SIGN "ROAD WORK AHEAD FINES DOUBLED" SHALL BE INSTALLED FOR ALL WORK ZONES THAT OCCUR ON ANY STATE HIGHWAY AND MUNICIPAL ROAD IN CONNECTICUT WHERE THERE ARE WORKERS PRESENT ON THE HIGHWAY.

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



## "END ROAD WORK" SIGN

THE LAST SIGN IN THE PATTERN SHALL BE THE "END ROAD WORK" SIGN.



CONSTRUCTION TRAFFIC CONTROL PLAN  
**ROAD WORK AHEAD  
 SIGNS**

SCALE: NONE

## 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 IN ADVANCE 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. TRAFFIC CONES AND PORTABLE CONSTRUCTION SIGNS SHALL NOT BE LEFT UNATTENDED.
5. ALL CONFLICTING 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 48 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  $\leq$  40 MPH).
8. IF THIS PLAN IS TO REMAIN IN OPERATION FROM SUNSET TO SUNRISE, INSTALL BARRICADE WARNING LIGHTS - HIGH INTENSITY ON ALL POST-MOUNTED DIAMOND SIGNS IN THE ADVANCE WARNING AREA.
9. A PORTABLE CHANGEABLE MESSAGE SIGN SHALL BE INSTALLED ONE HALF MILE 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'
35	245'
40	320'
45	540'
50	600'
55	660'
65	780'

CONSTRUCTION TRAFFIC CONTROL PLAN

### NOTES

SCALE: NONE

CONNECTICUT DEPARTMENT OF TRANSPORTATION  
BUREAU OF ENGINEERING & CONSTRUCTION

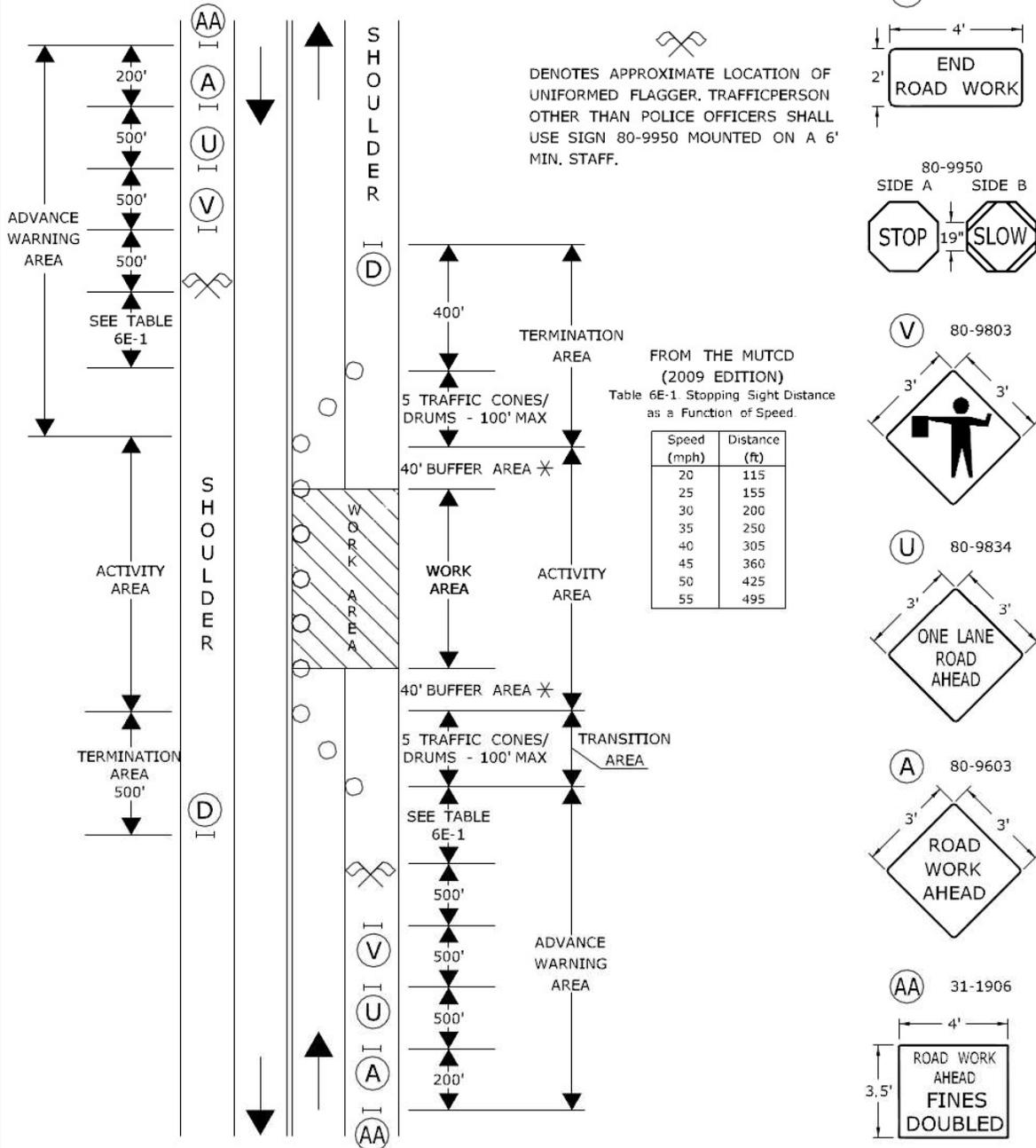
APPROVED

*Tracy L. Fogarty*  
PRINCIPAL ENGINEER

Tracy L. Fogarty, P.E.  
2019.09.13 06:47:47-04107

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

SIGN FACE  
108 SQ. FT (MIN.)



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



SCALE: NONE

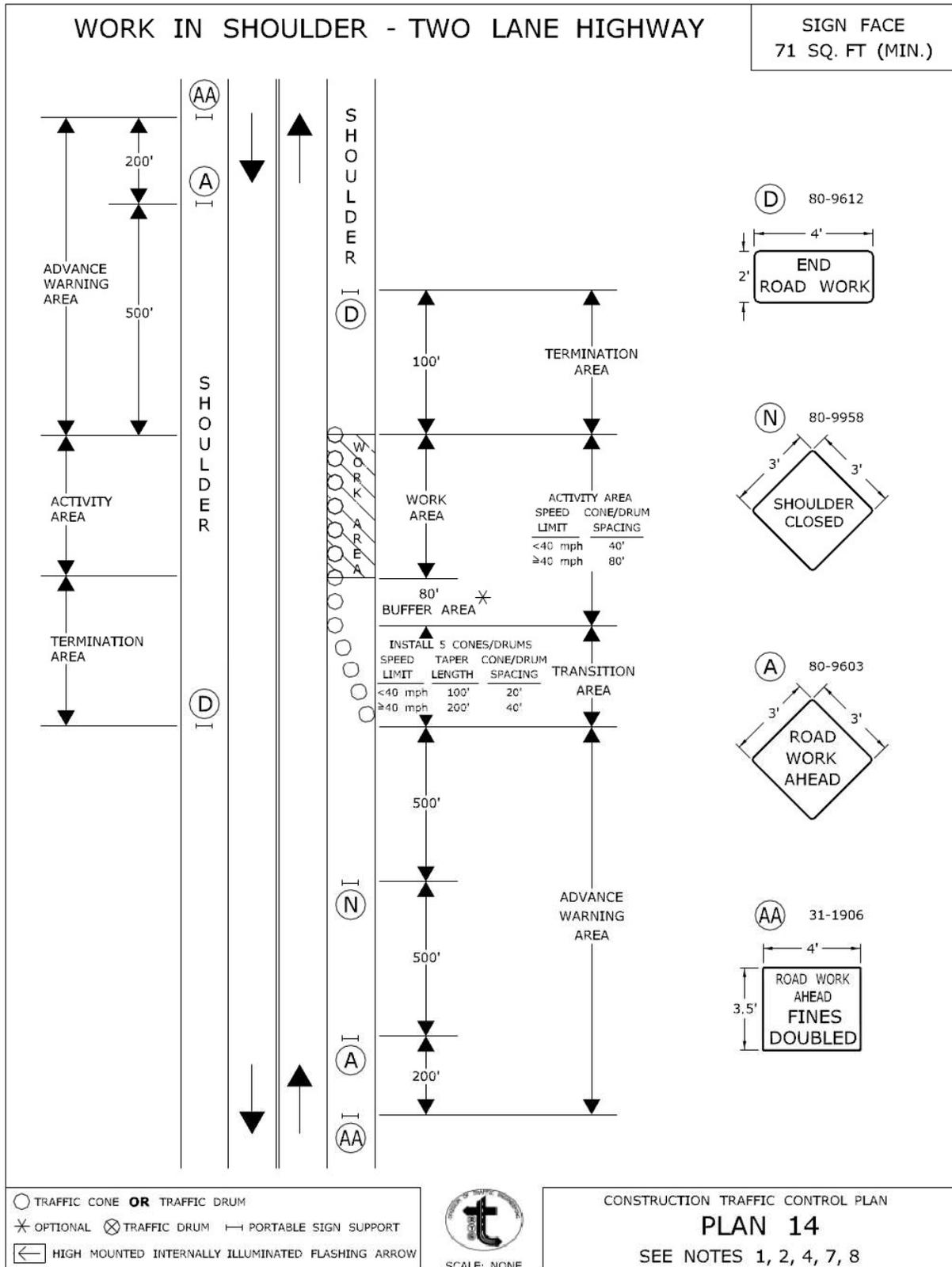
CONSTRUCTION TRAFFIC CONTROL PLAN  
**PLAN 13 - SHEET 1 OF 2**  
SEE NOTES 1, 2, 4, 6, 7, 8

CONNECTICUT DEPARTMENT OF TRANSPORTATION  
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

*Charles S. Harlow*  
PRINCIPAL ENGINEER

Charles S. Harlow  
2012.06.05 15:56:23-04'00"



- 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* Charles S. Harlow  
2012.06.05 15:56:09-04'00"  
PRINCIPAL ENGINEER

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

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

The cost of furnishing, installing, and removing the material for the 4H:1V traversable slope shall be paid for under the item “Maintenance and Protection of Traffic”.

**ITEM 0974005A    REMOVAL OF EXISTING RETAINING WALL**

**DESCRIPTION:**

The work covered under this item includes furnishing all labor and equipment for removal of existing walls for the construction of the sidewalk which are called out on the contract drawings or as directed by the City of Bristol Engineer. There are two existing retaining walls to be paid for under this item. They are both stone and mortar retaining walls. One of the existing retaining walls lies on property known as #465 Shrub Road. This wall runs along the edge of the driveway and the last ten feet (10') of this wall must be removed. The other retaining wall lies on property know as #3 Stevens Street.

**CONSTRUCTION METHODS:**

The Contractor shall remove only those stones specified in the contract documents. Contractor to coordinate with the City of Bristol Engineer prior to any stone removal. The Contactor shall notify the Landowners of #465 Shrub Road and #3 Stevens Street prior to stone retaining wall removal. If the landowner chooses to maintain ownership of the stones in the stone wall located on #465 Shrub Road, then the Contractor shall remove and store them at a location on the property as directed by the Landowner. The stone wall on the property located at #3 Stevens Street shall be carefully removed and stocked pile on the site and the stones shall be reused in the building of Retaining wall #1.

This Item also includes regrading the area where the existing retaining wall was to the grades shown on the construction documents. Furnishing and Placing of Topsoil and Turf Establishment – Lawn shall be paid for under the separate Items #094400 and #0950019, Respectively.

**METHOD OF MEASUREMENT:**

This item shall be measured as a lump sum for all retaining walls removed including furnishing all labor, equipment, and incidentals to remove stones.

**BASIS OF PAYMENT:**

Payment for Removal of stones shall be made based upon a lump sum of stones remove as shown on Contract Documents or as directed by City of Bristol Engineer.

<u>Item No.</u>	<u>Pay Item</u>	<u>Pay Unit</u>
0974005A	Removal of Existing Retaining Wall	L.S.

## **ITEM #1204122A – PROJECT SIGN**

### **Description:**

The work under this item shall consist of furnishing and installing a Local Transportation Capital Improvement Program (LOTICIP) project sign in the location as determined by the Engineer prior to construction and in accordance with the dimensions and details described herein. The final location of the plan shall be approved by the Engineer prior to installation.

### **Construction Methods:**

**SIGN PANEL:** Signs should be made from suitable materials to perform effectively for a minimum of 3 years. Example of allowable materials include ¾” MDO-EXT-APA Plywood or 0.125-gauge sheet aluminum. The following types of materials shall not be used: mesh, non-rigid, roll-up, corrugated or waffle board types substrates, foam core and composite aluminum sign substrates.

Suitable attachments shall be provided so that the signs can be firmly attached to the sign supports without causing damage to the signs.

Signs may be painted or use non-reflective plastic sheeting. Paint shall be extremely durable, high quality, semi-gloss enamel resistant to air, sun and water. Non-reflective plastic sheeting shall be permanently adhered to the backing. The material shall withstand 3 years’ vertical, south-facing exterior exposure.

**COLORS:** All letters and symbols shall be blue code #0000FF, rgb (0, 0, 255), pantone 294, or approved equal. Background shall be white code #FFFFFF, rgb (255, 255, 255), or approved equal. If plywood is used for the sign panel, the back of the panel shall be painted matte black.

**TYPEFACE:** Helvetica Medium

**SIGN SUPPORT:** Sign panels shall be attached to vertical sign support posts. All sign supports shall have breakaway features that meet AASHTO requirements contained in the current “Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals”. The breakaway features shall be structurally adequate to carry the sign panel at 60-mph wind loading. Installation shall be in accordance with the manufacturer’s recommendations. A minimum 2-ft embedment depth below the ground line is required.

**LOCATION:** The signs SHALL be installed parallel to the travelway, so they are NOT easily viewable by drivers, as the signs are not MUTCD compliant and not intended to be roadway signs.

The lateral offset from the edge of road to the face of sign should be 6-12 feet. 12 feet is preferred where space is available for installation. When installed on a trail, the lateral offset should be 2 feet. The bottom of the sign should be mounted 7 feet above the edge of road.

**DURATION:** The signs shall be erected for the life of the construction project. This means that they should be erected only after Notice to Proceed has been given to the contractor and should be removed with all other construction related signs at the end of the project considered to be the point that acceptance of the construction work is given.

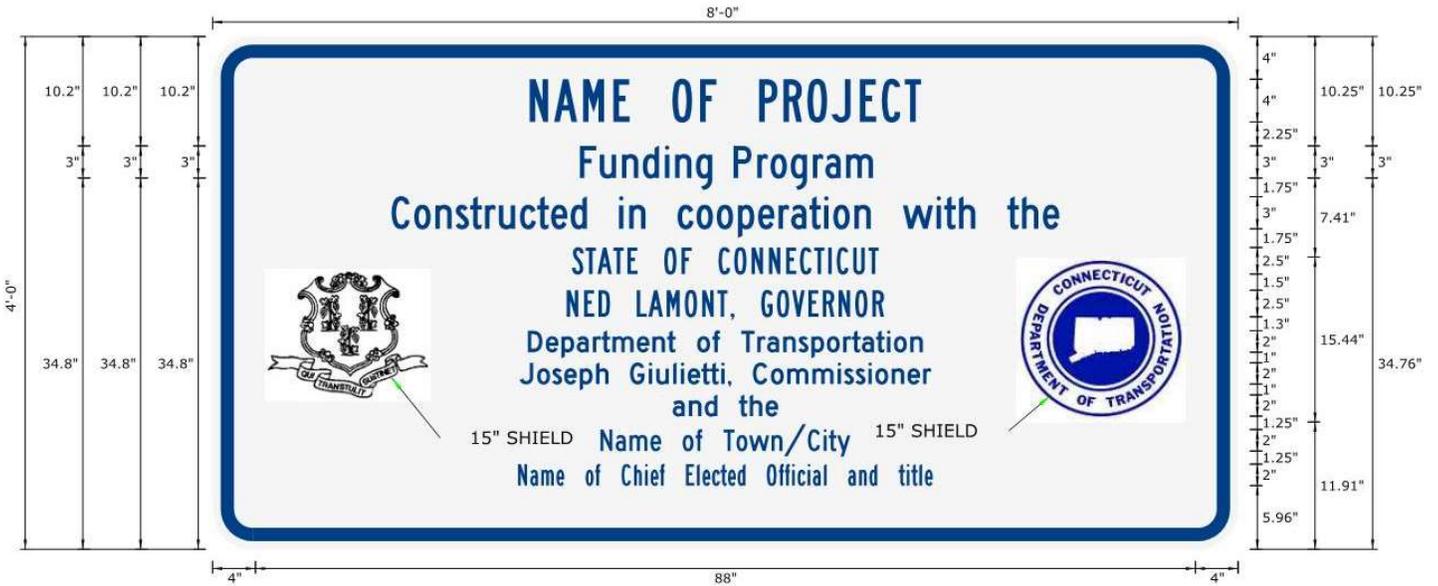
**Method of Measurement:**

This work will be measured for payment per each project sign installed complete and to the satisfaction of the Engineer.

**Basis of Payment:**

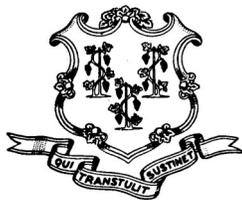
This work will be paid for at the contract unit price bid per each "Project Sign", which shall include all materials, labor and equipment necessary for furnishing and installing the project sign, completed and accepted, as detailed herein.

<u>Description</u>	<u>Unit</u>
Project Sign	EA



**EXCHANGE PLACE STREET REVITALIZATION – PHASE 2**  
 North Main Street, South Main Street, Bank Street and  
 Travel Center Plaza  
 Local Transportation Capital Improvement Program

Constructed in cooperation with the

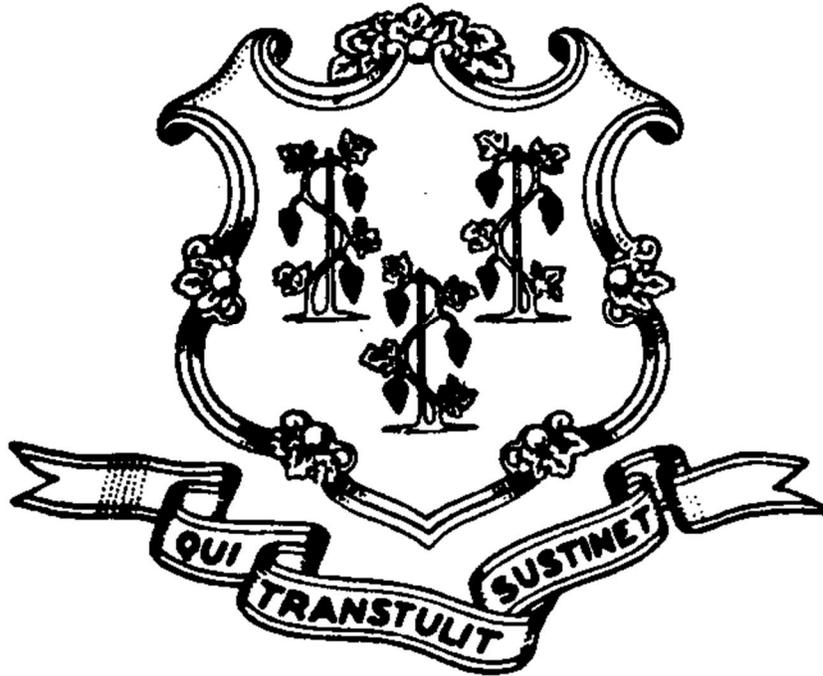


STATE OF CONNECTICUT  
 NED LAMONT, GOVERNOR

Department of Transportation  
 Garrett Eucalitto, Commissioner  
 and the  
 City of Bristol  
 Jeffrey Caggiano, Mayor



STATE SEAL



CTDOT LOGO



**ITEM NO. 1206023A - REMOVAL AND RELOCATION OF EXISTING SIGNS**

Section 12.06 is supplemented as follows:

**Article 12.06.01 – Description is supplemented with the following:**

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

**Article 12.06.03 – Construction Methods is supplemented with the following:**

The Contractor shall take care during the removal and relocation of existing signs, sign posts, and sign supports that are to be relocated so that they are not damaged. Any material that is damaged shall be replaced by the Contractor at no cost to the State.

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

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

**Article 12.06.04 – Method of Measurement is supplemented with the following:**

Payment under Removal and Relocation of Existing Signs shall be at the contract lump sum price which shall include all extruded aluminum and sheet aluminum signs, sign posts, and sign supports designated for relocation, all new sign posts and associated hardware for signs designated for relocation, all extruded aluminum signs, sheet aluminum signs, sign posts and sign supports designated for scrap, and foundations and other materials designated for removal and disposal, and all work and equipment required.

**Article 12.06.05 – Basis of Payment is supplemented with the following:**

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

Pay Item  
Removal and Relocation of Existing Signs

Pay Unit  
L.S.

**ITEM #1208937A – SIGN FACE - SHEET ALUMINUM (TYPE XI RETROREFLECTIVE SHEETING)**

*Section 12.08 is supplemented and amended as follows:*

**12.08.01—Description:**

*Add the following:*

All signs shall use Type XI retroreflective sheeting with the exception of side-mounted signs with white background which shall be Type IX.

This item shall also include field testing of metal sign base posts as directed by the Engineer.

Signs shall conform to the sign details located at <https://portal.ct.gov/DOT/Traffic-Engineering/Catalog-of-Signs> with legend for variable signs as shown in the plans.

**12.08.03—Construction Methods:**

*Delete the last sentence and add the following:*

Metal sign base posts shall be whole and uncut. Sign base post embedment and reveal lengths shall be as shown on the plans. The Contractor shall drive the metal sign base posts by hand tools, by mechanical means or by auguring holes. If an obstruction is encountered while driving or placing the metal sign base post, the Contractor shall notify the Engineer who will determine whether the obstruction shall be removed, the sign base post or posts relocated, or the base post installation in ledge detail shall apply. Backfill shall be thoroughly tamped after the posts have been set level and plumb.

**Field Testing of Metal Sign Posts:** When the sign installations are complete, the Contractor shall notify the Engineer the Project is ready for field testing. Based on the number of posts in the Project, the Engineer will select random sign base posts which shall be removed by the Contractor for inspection and measurement by the Engineer. After such inspection is completed at each base post location, the Contractor shall restore or replace such portions of the work to the condition required by the Contract. Refer to the table in 12.08.05 for the number of posts to be field tested.

**12.08.04—Method of Measurement:**

*Add the following:*

The work required to expose and measure sign base post length and embedment depth using field testing methods, and restoration of such work, will not be measured for payment and shall be included in the general cost of the work.

**12.08.05—Basis of Payment:**

*Replace the entire Article with the following:*

This work will be paid for at the Contract unit price per square foot for “Sign Face - Sheet Aluminum” of the type specified complete in place, adjusted by multiplying by the applicable Pay Factor listed in the table below. The price for this work shall include the completed sign, metal sign post(s), mounting hardware, including reinforcing plates, field testing, restoration and replacement of defective base post(s), and all materials, equipment, and work incidental thereto.

**Pay Factor Scale:** Work shall be considered defective whenever the base post length or base post embedment depth is less than the specified length by more than 2 inches. If the number of defects results in rejection, the Contractor shall remove and replace all metal sign base posts on the Project, at no cost to the Department.

**Number of Posts to be Tested and Pay Factors (Based on Number of Defects)**

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

Note: Projects with 50 or fewer posts will not include field testing