TOWN OF GLASTONBURY

INVITATION TO BID

BID #	ITEM	DATE & TIME REQUIRED
GL-2016-04	Williams Street East Sidewalks And Pedestrian Bridge	June 30, 2015 at 11:00 AM

The Town of Glastonbury is currently seeking bids for the construction of approximately 1,200 linear feet of 4-foot-wide concrete sidewalk along Williams Street East from New London Turnpike to Wilieb Street. The project also includes the installation of a prefabricated pedestrian bridge of welded steel construction on concrete abutments and a cast-in-place concrete retaining wall.

Bid Forms, Plans, and Specifications may be obtained from the Town's website at www.glastonbury-ct.gov at no cost or at the Office of the Purchasing Agent, Town Hall, 2155 Main Street, Glastonbury, Connecticut 06033, (second level) for a non-refundable fee of $75.

Prevailing Wages: The contractor must comply with Section 31-53 of the Connecticut General Statutes as amended, including annual adjustments in prevailing wages.

The Town reserves the right to waive informalities or reject any part of, or the entire bid, when said action is deemed to be in the best interests of the Town. All Sealed Bids must be submitted to the Office of the Purchasing Agent no later than the time and date indicated. All bids will be publicly opened and read.

The Town of Glastonbury is an Affirmative Action/Equal Opportunity Employer. Minority / Women / Disadvantaged Business Enterprises are encouraged to bid.

Mary F. Visone
Purchasing Agent

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1. Sealed bids **(one original and one copy)** on the attached Bid Forms will be received at the Office of the Purchasing Agent, Town Hall, 2155 Main Street, Glastonbury, Connecticut 06033 (second level). At the designated time of opening, they will be publicly opened, read, recorded and placed on file.

2. Whenever it is deemed to be in the best interest of the Town, the Town Manager, Purchasing Agent or designated representative shall waive informalities in any and all bids. The right is reserved to reject any bid, or any part of any bid, when such action is deemed to be in the best interest of the Town of Glastonbury.

3. The award will be on the basis of bid total cost unless otherwise specified. The bid total cost shall be arrived at by the mathematical calculation of the unit price multiplied times the number of units specified for each line item, and the total sum of all line items in the bid. In the event that the Town finds computational errors in a respondent's bid proposal, the bid total cost shall be recalculated by the Town based on the unit prices contained in the bid proposal.

4. Bids will be carefully evaluated as to conformance with stated specifications.

5. The envelope enclosing your bid should be clearly marked by bid number, time of bid opening, and date.

6. If a bid involves any exception from stated specifications, they must be clearly noted as exceptions, underlined, and attached to the bid.

7. The Bid Documents contain the provisions required for the requested item. Information obtained from an officer, agent, or employee of the Town or any other person shall not affect the risks or obligations assumed by the Bidder or relieve him/her from fulfilling any of the conditions of the bid.

8. Each Bidder is held responsible for the examination and/or to have acquainted themselves with any conditions at the job site which would affect their work before submitting a bid. Failure to meet this criteria shall not relieve the Bidder of the responsibility of completing the bid without extra cost to the Town of Glastonbury.

9. Any bid may be withdrawn prior to the above-scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No Bidder may withdraw a bid within sixty (60) days after the actual date of the opening thereof. Should there be reasons why a bid cannot be awarded within the specified period, the time may be extended by mutual agreement between the Town and the Bidder.

10. Each bid must be accompanied by a bid bond payable to the Town for ten percent (10%) of the total amount of the bid. The bid bond of the successful Bidder will be retained until the payment bond and performance bond have been executed and approved, after which it will be returned. A certified check may be used in lieu of a bid bond. The Town of Glastonbury will not be liable for the accrual of any interest on any certified check submitted. Cashier's checks will not be accepted.

11. A 100% Performance and Payment bond are required of the successful bidder. This bond shall cover all aspects of the specification and shall be delivered to the Purchasing Agent prior to the issuance of a purchase order. The Performance and Payment Bond will be returned upon the delivery and acceptance of the bid items.

12. The Bidder agrees and warrants that in the submission of this sealed Bid, they will not discriminate or permit discrimination against any person or group of persons on the grounds of

race, color, religion, national origin, sex, or physical disability including, but not limited to blindness, unless it is shown by such Bidder that such disability prevents performance of that which must be done to successfully fulfill the terms of this sealed Bid or in any manner which is prohibited by the laws of the United States or the State of Connecticut: and further agrees to provide the Human Relations Commission with such information requested by the Commission concerning the employment practices and procedures of the Bidder. An Affirmative Action Statement will be required by the successful Bidder.

13. Bidder agrees to comply with all of the latest Federal and State Safety Standards and Regulations and certifies that all work required in this bid will conform to and comply with said standards and regulations. Bidder further agrees to indemnify and hold harmless the Town for all damages assessed against the Town as a result of Bidder's failure to comply with said standards and/or regulations.

14. All correspondence regarding any purchase made by the Town of Glastonbury shall reference the Town's purchase order number. Each shipping container shall clearly indicate both Town purchase order number and item number.

15. Bidder is required to review the Town of Glastonbury Code of Ethics adopted July 8, 2003 and effective August 1, 2003. Bidder shall acknowledge that they have reviewed the document in the area provided on the bid/proposal response page (BP). The selected Bidder will also be required to complete and sign an Acknowledgement Form prior to award. The Code of Ethics and the Consultant Acknowledgement Form can be accessed at the Town of Glastonbury website at **www.glastonbury-ct.gov**. Upon entering the website click on the **Bids & Proposals icon** which will bring you to the links for the **Code of Ethics** and the **Consultant Acknowledgement Form**. If the Bidder does not have access to the internet, a copy of these documents can be obtained through the Purchasing Department at the address listed within this bid/proposal.

16. **Non-Resident Contractors:**

Upon award the Town is required to report names of nonresident (out of state) Contractors to the State of Connecticut, Department of Revenue Services (DRS) to ensure that Employment Taxes and other applicable taxes are being paid by Contractors.

A single surety bond for 5% of the entire contract price is required to be filed with DRS by any unverified nonresident prime or general contractor (if awarded) where the contract price for the project is $250,000 or more. The contractor will be required to promptly furnish to the Town a copy of the **Form AU-968 - Certificate of Compliance** issued by the State of Connecticut, DRS. See State of Connecticut **Notice SN 2012 (2).**

17. Bidder shall include on a sheet(s) attached to its proposal a complete disclosure of all past and pending mediation, arbitration and litigation cases that the bidder or its principals (regardless of their place of employment) have been involved in for the most recent five years. Please include a statement of the issues in dispute and their resolution. Acceptability of Bidder based upon this disclosure shall lie solely with the Town.

18. Bidder or its principals, regardless of their place of employment, shall not have been convicted of, nor entered any plea of guilty, or nolo contendere, or otherwise have been found civilly liable or criminally responsible for any criminal offense or civil action. Bidder shall not be in violation of any State or local ethics standards or other offenses arising out of the submission of bids or proposals, or performance of work on public works projects or contracts.

19. It is the responsibility of the bidder to check the Town's website before submitting bid for addendums posted prior to bid opening.

20. **Prevailing Wage Rates:**

Respondents shall comply with State Statutes concerning Employment and Labor Practices, if applicable, and Section 31-53 of the Connecticut General Statutes, as amended (Prevailing Wages). Wage Rate Determination for this project from the State of Connecticut is included in the Bid Documents. Certified payrolls for site labor shall be submitted weekly to the Town's Representative or his designee on the correct State of Connecticut form (see RFP). The Town reserves the right to, without prior notice, audit payroll checks given to workers on site in order to ascertain that wages and fringe benefits are being paid as required by the State of Connecticut. Please make special note of the State requirement to adjust wage and fringe benefit rates on each July 1st following the original published rates.

NOTE that respondent is to include in its proposal all costs required by such annual increases in the PREVAILING RATES. NO escalation clauses are to be included in the respondent's proposal and NO escalation clauses will be in the Contract Agreement. Respondent is to anticipate any future increases and include these costs in the proposal response.

Contractor's invoices will not be paid if certified payrolls are incomplete, incorrect or not received in a timely manner.

All Apprentices must be registered with the State of Connecticut and their number shall not exceed the number allowed by law. Otherwise, all workers must be paid at least the Journeyman rate listed including benefits.

OSHA SAFETY AND HEALTH CERTIFICATION

Effective July 1, 2009: Any Mechanic, Laborer, or Worker, who performs work in a classification listed on the prevailing wage rate schedule on any public works project covered under C.G.S. Section 31-53, both on site and on or in the public building, must have completed a federal OSHA Safety and Health course within the last 5 years.

21. Each bid shall also include a description of three (3) projects completed by the bidder with references to demonstrate successful experience with similar projects.

IMPORTANT: Failure to comply with general rules may result in disqualification of the Bidder.

NOTE: Any technical questions regarding this bid shall be made in writing (email acceptable) and directed to Stephen Braun, Assistant Town Engineer, 2155 Main Street, PO Box 6523, Glastonbury, CT 06033; stephen.braun@glastonbury-ct.gov. Telephone (860) 652-7743 between the hours of 8:00 a.m. – 4:30 p.m. For administrative questions concerning this bid/proposal, please contact Mary F. Visone, Purchasing Agent, at (860) 652-7588 or email the Purchasing Department at purchasing@glastonbury-ct.gov. All questions, answers, and/or addenda, as applicable, will be posted on the Town's website at www.glastonbury-ct.gov (Upon entering the website scroll down to click on Bids & Proposals Icon; click the Bid Title to view all bid details and document links.). The request must be received at least five (5) business days prior to the advertised response deadline**. It is the respondent's responsibility to check the website for addenda prior to submission of any bid/proposal.**

01.00 WORKMANSHIP, MATERIALS AND EMPLOYEES

01.01 Wherever in this contract the word "Engineer" is used, it shall be understood as referring to the Town Engineer/Manager of Physical Services of the Town of Glastonbury acting personally or through any assistants duly authorized.

01.02 The entire work described herein shall be completed in accordance with the plans and specifications to the full intent and meaning of the same. Unless otherwise specified, all materials incorporated in the permanent work shall be new, and both workmanship and material shall be of good quality. The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

01.03 The wording "furnish", "install", "construct", "furnish and install", or any similar terms, unless specifically noted to the contrary, shall include all labor, materials, water, tools, equipment, light, power, transportation, and any other services required for the completion of the work.

01.04 The Contractor shall at all times enforce strict discipline and good order among his employees, and shall seek to avoid employing on the work any unfit person or anyone not skilled in the work assigned to him.

02.00 SUPERINTENDENT

02.01 The Contractor shall keep on the work during its progress, in the absence of the Contractor, a competent Superintendent. The Superintendent shall be acceptable to the Engineer and shall fully represent the Contractor. All directions given to the Superintendent shall be binding as if given to the Contractor.

03.00 PRECONSTRUCTION MEETING

03.01 A Preconstruction Meeting will be held with the Engineer, Contractor, and any private utility company prior to commencing any work. The Engineer shall arrange the meeting based on a mutually convenient time.

04.00 PERMITS

04.01 Other than local permits, all permits, licenses, and fees required for the performance of the Contract work shall be secured and paid for by the Contractor.

05.00 PROPERTY ACCESS

05.01 The Contractor shall take all proper precautions to protect from injury or unnecessary interference, and provide proper means of access to abutting property where the existing access is cut off by the Contractor.

05.02 The Contractor shall take all proper precautions to protect persons from injury or unnecessary inconvenience and leave an unobstructed way along the public and private places for travelers, vehicles, and access to hydrants.

05.03 The Contractor shall make arrangements with the adjacent property owners for such trespass as he may reasonably anticipate in the performance of the work. All such arrangements shall be reported, in writing, to the Engineer.

06.00 PROTECTION OF THE PUBLIC AND OF WORK AND PROPERTY

06.01 The Contractor shall continuously maintain adequate protection of all work from damage, and shall take all reasonable precautions to protect the Town from injury or loss arising in connection with the Contract.

06.02 The Contractor shall adequately protect adjacent private and public property as provided by law and the Contract Documents.

06.03 The Contractor shall make good any damage, injury, or loss of his work and to the property of the Town resulting from lack of reasonable protective precautions.

07.00 EXISTING IMPROVEMENTS

07.01 The Contractor shall conduct his work so as to minimize damage to existing improvements. Except where specifically stated otherwise in the specifications, drawings, or as directed by the Engineer, it will be the responsibility of the Contractor to restore to their original condition, as near as practical, all improvements on public or private property. This shall include:

a. Property within and adjacent to the side of installation such as shrubs, walks, driveways, fences, etc.

b. Utility mains, ducts, poles, and services. The Contractor is hereby notified that utilities, if/where shown on the plans, are at approximate locations. These locations are subject to possible errors in the source of information and errors in transcription. The Contractor shall make certain of the exact location of all mains, ducts, poles, and services prior to excavation.

08.00 SEPARATE CONTRACTS

08.01 The Engineer reserves the right to let other contracts in connection with this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs. Wherever work being done by the Town of Glastonbury forces or by other contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by the Engineer to secure the completion of the various portions of the work.

09.00 INSPECTION OF WORK

09.01 The Town shall provide sufficient personnel for the inspection of the work.

09.02 The Engineer shall at all times have access to the work whenever it is in preparation or progress, and the Contractor shall provide proper facilities for such access and for inspection.

09.03 If the specifications or the Engineer's instructions require any work to be specially tested or approved, the Contractor shall give the Engineer timely notice of its readiness for inspection and, if the inspection is by another authority other than the Engineer, of the date fixed for such inspection. Inspections by the Engineer shall be made promptly. If any work should be covered up without approval or consent of the Engineer, it must, if required by the Engineer, be uncovered for examination and properly restored at the Contractor's expense.

09.04 Reinspection of any work may be ordered by the Engineer. If such work is found to be in accordance with the Contract Documents, the Town shall pay the cost of reinspection and replacement. If such work is not in accordance with the Contract Documents, the Contractor shall pay such cost.

10.00 RIGHT TO INCREASE OR DECREASE WORK

10.01 The Town shall have the right to increase or decrease the amount of work herein specified as may be required.

11.00 RIGHT OF ENGINEER TO STOP WORK FOR WEATHER CONDITIONS

11.01 Should the work, in the opinion of the Engineer, be in danger by reason of inclemency of weather, or could not be finished in time to prevent such danger, the Contractor shall cease operations upon order of the Engineer, and shall not resume them until ordered to do so by the Engineer when the weather conditions are favorable. The Contractor shall, upon such orders, discontinue work, remove all materials or appliances for or in use upon the work, and place the streets in proper condition for use by the public during the time the work is suspended as herein provided, without cost to the Town.

12.00 CONTRACTOR TO BE RESPONSIBLE FOR IMPERFECT WORK OR MATERIALS

12.01 Any faithful work or imperfect material that may be discovered before the acceptance and the payment of the work shall be corrected upon the order of the Engineer. The acceptance and payment of the work does not in any manner relieve the Contractor of his obligation to construct work in the proper manner and the use of materials herein specified.

13.00 TOWN MAY NOTIFY CONTRACTOR IF WORK IS NOT CARRIED ON SATISFACTORILY

13.01 If, in the opinion of the Engineer, the Contractor is not proceeding with the work at a sufficient rate of progress so as to finish in the time specified, or has abandoned said work, or is not complying with the terms and stipulations or the Contract and specifications, the Engineer may serve notice on the Contractor to adopt such methods as will ensure the completion of the work in the time specified.

13.02 If, within five days after the Engineer has notified the Contractor that his work is not being carried on satisfactorily as before mentioned, the Engineer shall have the right to annul the Contract and manage the work under the direction of the Engineer, or re-let, for the very best interest of the Town as a new contract, the work under said new Contract shall be considered the responsibility of the defaulting Contractor.

13.03 Additional costs incurred over and above the original Contract shall be borne by the Performance Bond.

14.00 DEDUCTIONS FOR UNCORRECTED WORK

14.01 If the Engineer deems it inexpedient to correct work that has been damaged or that was not done in accordance with the Contract, an equitable deduction from the Contract price shall be made therefor.

14.02 The Contractor shall promptly remove from the premises all materials condemned by the Engineer as failing to meet Contract requirements, whether incorporated in the work or not, and the Contractor shall promptly replace and re-execute his own work in accordance with the Contract and without expense to the Town, and shall bear the expense of making good all work by other contractors destroyed or damaged by such removal or replacement.

14.03 If the Contractor does not remove such condemned work and materials as promptly as possible after written notice, the Engineer may remove them and store the materials at the expense of the Contractor.

15.00 CLEANING UP

15.01 The Contractor must remove all debris of every description as the work progresses and leave the surroundings in a neat and orderly condition to the satisfaction of the Engineer.

15.02 Upon completion, and before acceptance and final payment, the Contractor shall remove from the site all equipment, forms, surplus material, rubbish and miscellaneous debris and leave the site in a neat and presentable condition.

16.00 ROYALTIES AND PATENTS

16.01 The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Town of Glastonbury harmless from loss on account thereof, except that the Town of Glastonbury shall be responsible for all such loss when a particular manufacturer, product, or process is specified by the Town of Glastonbury.

01.00 NOTICE TO CONTRACTOR

01.01 Intent of Contract: The intent of the Contract is to prescribe a complete work or improvement that the Contractor undertakes to do, in full compliance with the specifications, plans, special provisions, proposal, and Contract. The Contractor shall perform all work in close conformity with the lines, grades, typical cross-sections, dimensions, and other data shown on the plans or as modified by written orders, including the furnishing of all materials, implements, machinery, equipment, tools, supplies, transportation, labor, and all other things necessary to the satisfactory prosecution and completion of the project.

01.02 The Contractor is hereby alerted to the fact that the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction, Form 816 (Form 816) and supplements thereto are to be considered part of the Contract Documents. The Form 816 shall not be provided by the Town and any cost associated therewith shall be the responsibility of the Contractor. In case of any discrepancy between the Contract Drawings or Specifications and the Form 816, the matter shall immediately be submitted to the Engineer. The Engineer shall have sole authority in resolving any discrepancies.

01.03 Much time and effort has gone into this project in an effort to minimize impact on trees and adjacent properties. Extreme care shall be taken by the Contractor to honor commitments made by the Town. Prior to doing any work, the Contractor shall meet with the Engineer to become familiar with the conditions encountered and commitments made.

01.04 Protection of the existing stone masonry house foundation at #256 Williams Street East is of paramount importance during construction. With the exception of the portions of the work indicated to be excavated using hand methods only, the Contractor shall use a mini-excavator or similar equipment approved by the Engineer to conduct all excavation work within 20 feet of this house foundation to minimize potential for disturbance. Compaction equipment used in this area shall be the smallest necessary to achieve the required compaction, as approved by the Engineer. Contractor shall assume all responsibility and liability for damages to the foundation and shall repair any damage at no additional cost to the Town.

01.05 Traffic Cones and Drums: Traffic Drums and 42-inch Traffic Cones shall have four six-inch wide stripes (two - white and two - orange) of flexible bright fluorescent sheeting. The material for the stripes shall be one of the following, or approved equal:

- 3M Scotchlite Diamond Grade Flexible Work Zone Sheeting, Model 3910 for the white stripes and Model 3914 for the orange stripes,
- Avery Dennison WR-7100 Series Reboundable Prismatic Sheeting, Model WR-7100 for the white stripes and Model WR-7114 for the orange stripes.

01.06 NCHRP 350 Requirements For Work Zone Traffic Control Devices:
CATEGORY 1 DEVICES (traffic cones, traffic drums, tubular markers, flexible delineator posts): Prior to using the Category 1 Devices on the project, the Contractor shall submit to the Engineer a copy of the manufacturer's self-certification that the devices conform to NCHRP Report 350.

CATEGORY 2 DEVICES (construction barricades, construction signs and portable sign supports): Prior to using Category 2 Devices on the project, the Contractor shall submit

to the Engineer a copy of the Letter of Acceptance issued by the FHWA to the manufacturer documenting that the devices (both sign and portable support tested together) conform to NCHRP Report 350 (TL-3).

NOTE: The portable wooden sign supports that have been traditionally used by most contractors in the State of Connecticut do NOT meet NCHRP Report 350 criteria and shall not be utilized on any project advertised after October 01, 2000.

Information regarding NCHRP Report 350 devices may be found at the following web sites:

FHWA: http://safety.fhwa.dot.gov/roadway_dept/road_hardware/index.htm

ATSSA: http://www.atssa.com/resources/NCHRP350Crashtesting.asp

02.00 COMMUNICATIONS

02.01 All notices, demands, requests, instructions, approvals, proposals, and claims must be in writing.

02.02 Any notice to, or demand upon, the Contractor shall be sufficiently given if delivered at the office of the Contractor stated on the signature page of the Agreement (or at such other office as the Contractor may, from time to time, designate) in a sealed, postage-prepaid envelope or delivered with charges prepaid to any telegraph company for transmission, in each case addressed to such office.

02.03 All papers required to be delivered to the Town shall, unless otherwise specified in writing to the Contractor, be delivered to the Town Engineer/Manager of Physical Services, 2155 Main Street, Glastonbury, CT 06033, and any notice to, or demand upon, the Town shall be delivered at the above address in a sealed, postage-prepaid envelope or delivered with charges prepaid to any telegraph company for transmission, in each case addressed to such office or to such other representatives of the Town, or to such other address as the Town may subsequently specify in writing to the Contractor for such purpose.

02.04 Any such notice shall be deemed to have been given as of the time of actual delivery or, in case of mailing, when the same should have been received in due course of post or, in the case of telegrams, at the time of actual receipt, as the case may be.

03.00 PARTIAL USE OF IMPROVEMENTS

03.01 The Town may, at its election, give notice to the Contractor and place in use those sections of the work that have been completed, inspected and can be accepted as complying with the Contractor Documents and if, in its opinion, each such section is reasonably safe and fit for the use and accommodation for which it was intended, provided:

a. The use of such sections of the work shall not materially impede the completion of the remainder of the work by the Contractor.

b. The Contractor shall not be responsible for any damages or maintenance costs due directly to the use of such sections.

c. The use of such sections shall in no way relieve the Contractor of his liability due to having used defective materials or to poor workmanship.

d. The period of guarantee shall not begin until the date of the final acceptance of all work required under this Contract.

04.00 INSURANCE

04.01 The Bidder shall, at its own expense and cost, obtain and keep in force during the entire duration of the Project or Work the following insurance coverage covering the Bidder and all of its agents, employees and sub-contractors and other providers of services and shall name the **Town of Glastonbury and its employees and agents as an Additional Insured** on a primary and non-contributory basis to the Bidders Commercial General Liability and Automobile Liability policies. **These requirements shall be clearly stated in the remarks section on the Bidders Certificate of Insurance.** Insurance shall be written with insurance carriers approved in the State of Connecticut and with a minimum Best's Rating of A-VIII. In addition, all carriers are subject to approval by the Town. Minimum Limits and requirements are stated below:

a. Worker's Compensation Insurance:

- Statutory Coverage
- Employer's Liability
- $500,000 each accident/$500,000 disease-policy limit/$500,000 disease each employee
- A Waiver of Subrogation shall be provided

b. Commercial General Liability:

- Including Premises and Operations, Products and Completed Operations, Personal and Advertising Injury, Contractual Liability and Independent Contractors
- Limits of Liability for Bodily Injury and Property Damage
  Each Occurrence: $1,000,000
  Aggregate: $2,000,000
  (The Aggregate Limit shall apply separately to each job.)
- A Waiver of Subrogation shall be provided

c. Automobile Insurance:

- Including all owned, hired, borrowed, and non-owned vehicle
- Limit of Liability for Bodily Injury and Property Damage
  Per Accident: $1,000,000
- A Waiver of Subrogation shall be provided

d. Umbrella of Excess Liability:

- State in the Remarks Section that coverage is follow form.
- Limit of Liability Each Occurrence $1,000,000
  Aggregate $1,000,000

04.02 The Bidder shall direct its Insurer to provide a Certificate of Insurance to the Town before any work is performed. The Contractor shall be responsible to notify the Town **60 days** in advance with written notice of cancellation or non-renewal. The Certificate shall evidence all required coverage. The Bidder shall provide the Town copies of any such insurance policies upon request.

04.03 INDEMNIFICATION: To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Town and its consultants, agents, and employees from and against all claims, damages, losses and expenses, direct, indirect or consequential (including but not limited to fees and charges of engineers, attorneys and other professionals and court and arbitration costs) to the extent arising out of or resulting from the performance of the Contractor's work, provided that such claim, damage, loss or expense is caused in whole or in part by any negligent act or omission by the Contractor, or breach of its obligations herein or by any person or organization directly or indirectly employed or engaged by the Contractor to perform or furnish either of the services, or anyone for whose acts the Contractor may be liable.

05.00 WORK BY OTHERS

05.01 Private utilities, contractors, developers or other parties may be expected to be working within the Contract area during this Contract. It shall be the responsibility of the Contractor to coordinate his work with the work being done by others in order that the construction shall proceed in an efficient and logical manner. The Contractor shall have no claim or claims whatever against the Town, the Engineer, or other parties due to delays or other reasons caused by the work by others or his failure to coordinate such work.

06.00 CONTRACTOR'S WORK AND STORAGE AREA

06.01 The Contractor shall contact the Town to determine if any specific locations will be designated, or gain its approval prior to using any area for storage of equipment, materials and trailers during the period of this Contract. The Contractor shall confine his work/storage area to the limits as designated or approved and shall be responsible for the security of the work/storage area. Upon completion of the Contract, the Contractor shall remove all equipment and materials, except as otherwise specified, and restore the site to its original condition as approved by the Engineer and at no cost to the Town.

07.00 DISPOSAL AREA

07.01 The Tryon Street Bulky Waste Facility will be available to the Contractor, at no charge, for disposal of materials that are accepted at that facility. Waste disposal guidelines for the Bulky Waste facility are published on the Town web site at the address shown below. Each bidder shall have reviewed and understand these guidelines prior to submitting a bid for the project.

http://www.glastonbury-ct.gov/Modules/ShowDocument.aspx?documentid=699

Acceptable materials generally include such materials as brush, stumps, demolition materials, and excess excavated earth materials. Unacceptable materials generally include such items as carpet, appliances, upholstered furniture; hazardous wastes such as pesticides, oil based paints and thinners; or other wastes as designated by the State Department of Environmental Protection. Demolition material cannot contain asbestos or other hazardous materials.

The Contractor shall obtain a disposal area for all other unsuitable or surplus materials at no cost to the Town.

08.00 DUST CONTROL

08.01 During the progress of the work, the Contractor shall conduct his operations and maintain the area of his activities so as to minimize the creation and dispersion of dust. If the Engineer decides that it is necessary to use water or calcium chloride for more effective dust control, the Contractor shall furnish and spread the material, as directed, without additional compensation.

09.00 MAINTENANCE / GUARANTEE PERIOD

09.01 The Contractor shall be held responsible to the Town for maintenance for a minimum of one-year following completion of all work under this Contract with respect to defects, settlements, etc.

10.00 PROTECTION OF EXISTING UTILITIES

10.01 Prior to opening an excavation, effort shall be made to determine whether underground installations, (i.e., sewer, water, fuel, electric lines, etc.) will be encountered and, if so, where such underground installations are located. Before starting any excavation, the Contractor shall submit to the Engineer plans or details showing the proposed method the Contractor will use to support and protect all existing utilities during construction. The furnishing of such plans and details shall not serve to relieve the Contractor of any responsibility for the proper conduct of the work.

10.02 When the excavation approaches the estimated location of such an installation, the exact location shall be determined by careful probing or hand digging, and when it is uncovered, proper supports shall be provided for the existing installation. Utility companies shall be contacted and advised of proposed work prior to the start of actual excavation.

10.03 With the exception of the specific utilities identified in Section 615, there will be no extra payment for submitting plans or details for supporting and protecting for all other existing utilities during construction.

11.00 TIME FOR COMPLETION/NOTICE TO PROCEED

11.01 **It the Town's intent to begin work on this contract immediately. As such, within five (5) business days after the date of the Notice of Award the Contractor must provide the appropriate bond and insurance certificates to the Town Purchasing Agent and must be issued a Purchase Order for the Project prior to initiating any work.** The Town will schedule a pre-construction meeting immediately upon award of this contract and intends to issue a Notice to Proceed at the meeting.

11.02 Work shall continue in an orderly fashion such that all contract work is substantially complete within seventy five (75) calendar days from the date of the Notice to Proceed.

11.03 Delivery and installation of the prefabricated pedestrian bridge can be completed outside of the required 75 calendar day contract time without the Contractor being charged liquidated damages as long as all other contract work is complete, bridge shop drawings are approved, and a firm delivery date for installation of the bridge is provided.

12.00 LIQUIDATED DAMAGES

12.01 As actual damages for any delay in completion of the work that the Contractor is required to perform under this Contract are impossible to determine, the Contractor and the Sureties shall be liable for and shall pay to the Town the sum of $500.00 as fixed, agreed and liquidated damages for each calendar day of delay from the above-stipulated completion, or completion as modified in writing by both parties, until such work is satisfactorily completed and accepted.

13.00 SCHEDULE OF DRAWINGS

13.01 The Contractor is hereby alerted that the plan set entitled "Plans Depicting Proposed Sidewalk Improvements located on Williams Street East, Glastonbury Connecticut" including seven (7) plan sheets prepared by the Town of Glastonbury Engineering Division and Lenard Engineering, Inc. is to be considered part of these specifications.

14.00 CHANGES IN THE WORK

14.01 The Town reserves the right to perform portions of the work in connection with these plans and specifications. The reduction in the work to be performed by the Contractor shall be made without invalidating the Contract. Whenever work is done by the Town contiguous to other work covered by this Contract, the Contractor shall provide reasonable opportunity for the execution of the work and shall properly coordinate his work with that of the Town.

15.00 LAYOUT OF WORK

15.01 The Town shall provide stake-out of the work in accordance with the plans or as directed by the Engineer. The Contractor shall protect all stakes from damage or destruction and shall be responsible to assure that the grade stakes have not been altered prior to actual construction. The Town shall replace grade stakes that have been removed, at no cost to the Contractor, if their removal was caused by reasons beyond reasonable care and protection by the Contractor. If it is determined by the Engineer that the Contractor did not provide reasonable protection, the cost of restaking will be deducted from any amounts due the Contractor in the performance of the work.

16.00 REMOVAL AND STORAGE OF MATERIALS AND STRUCTURES FOUND ON THE WORK

16.01 All salvable materials, including topsoil, gravel, fill materials, etc. and structures, including drainage pipes, catch basins and manhole frames and covers, guide railing, etc. that are not to remain in place or that are not designated for use in the work, shall be carefully removed by the Contractor and stored at such places as directed by the Engineer. All salvable materials removed and stored shall remain the property of the Town. The Engineer shall determine the materials or structures to be salvaged.

17.00 PROSECUTION AND PROGRESS

17.01 ADVANCE NOTICE: The Contractor shall give the Engineer a seven-day advance written notice of construction activities that will alter traffic patterns that result in lane shifts, detours, temporary closures of lane(s), permanent closure of lane(s), or lane reductions. This advance notification will allow the Town to publish news releases and/or provide public radio announcements to inform the public of revised traffic patterns or possible traffic delays. Failure of the Contractor to provide such timely notice shall be considered a breach of Contract and will subject the Contractor to stop work orders until such time as the seven-day notice has been satisfied.

17.02 ALLOWABLE HOURS OF OPERATION (WORK PERIOD):

All contract work that maintains bi-directional traffic on 11 foot wide travel lanes shall be performed Monday through Friday during the regular business hours of 7:30 AM and 4:30 PM.

Any work that requires alternating one-way traffic on Williams Street shall be performed Monday through Friday during the hours of 9:00 AM and 2:00 PM. Longer work hours for alternating one-way traffic may be approved by the Town for time periods when school is not in session if requested in writing by the Contractor, and approved by the Engineer and Chief of Police.

Work on weekends or during time periods other than those described above will not be permitted. No work will be allowed on designated Town Holidays unless permission is granted by the Town.

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

The Contractor shall ensure that suitable temporary access is provided to all residential and commercial driveways at all times as described in the Special Provision for Maintenance and Protection of Traffic.

18.00 EXTRA WORK AND RETAINAGE

18.01 Extra and cost plus work shall be governed by Article 1.04.05 and Article 1.09.04 of the Form 816.

18.02 Retainage shall be governed by Article 1.09.06 of the Form 816, except that the retainage amount shall be equal to five (5) percent.

19.00 COMPLIANCE WITH ENVIRONMENTAL PERMITS

19.01 A Town of Glastonbury Inland Wetland Permit was required for this project. This permit approval is included as Attachment D of this Bid Document for reference by the Contractor. By submitting a bid, the Contractor confirms that they have read and are familiar with all of the required conditions of this permit and will conduct the work in a manner consistent with these requirements.

20.00 SUBMITTALS AND MATERIALS TESTING

20.01 The Contractor shall provide source and supply information, sieve analysis, and material samples for gravel subbase, process stone base, modified riprap, and other granular materials to the Town for review and approval. The Town shall retain a lab for testing of these materials as required and shall perform in place compaction testing at no expense to the Contractor.

20.02 Shop drawings / catalog cuts shall be provided by the Contractor for all pre-cast concrete structures, pipes and fittings, erosion control products, seed mixes, and other items to be supplied for review and approval by the Engineer as described in the specifications and the Form 816.

20.03 Mix designs for all bituminous and portland cement concrete materials shall be provided by the Contractor to the Engineer for review and approval.

20.04 Certified Materials Test Reports and Materials Certificates shall be provided for all products and materials to be provided under this contract as described in these specifications and the Form 816.

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002.0 PREPARATION OF SITE

002.1 General: The Contractor shall furnish all labor, materials, tools, and equipment necessary and shall do all work to prepare the site as indicated on the drawings and as herein specified.

002.2 Tree Removal: Removal of trees as indicated on the plans shall be performed by workman skilled in the area of tree removal under the supervision of a Connecticut Licensed Arborist. The Contractor shall mark all trees, shrubs, and plants to be removed in accordance with the plans and these specifications. The Engineer shall have 7 days to field review the markings and make any adjustments prior to the start of the clearing operation.

Trees and shrubs within the right-of-way or within any property owned by the Town of Glastonbury that are designated for removal must be posted as such by the Glastonbury Tree Warden (Mr. Greg Foran of the Parks and Recreation Department,860-652-7686) for a period of 10 days prior to removal. **No trees or shrubs within the Town of Glastonbury right-of-way shall be cut or removed until such posting has been completed and subsequent approval given by the Tree Warden.**

In general, no trees, etc. in public streets and highways are to be cut or damaged in any way except as noted on the plans. Trees, bushes, and growing crops on other lands may be cut, removed, or trimmed only to the extent provided in the terms of the rights-of-way or access rights possessed by the Town, and also only within the limits and in the manner, if any, indicated by the Engineer or by the drawings or Special Conditions.

002.3 Tree Trimming: Trimming of trees by a Connecticut Licensed Arborist is included under this item as required for clearance of construction equipment and pedestrians below the tree canopy. When the canopy of a tree must be elevated for clearance above the proposed improvements, trimming shall be done around the entire circumference of the tree.

002.4 Tree Protection and Care of Property: The Contractor shall install high visibility construction fence at the drip line of the tree canopy as shown on the plans and as directed by the Engineer to protect existing trees that are not to be cut from damage during construction. The Engineer, at his sole discretion, may also direct the Contractor to enclose the trunks of trees adjacent to his work that are not to be cut with substantial wooden boxes of such height as may be necessary to protect them from injury from piled material, from equipment, from his operations, or otherwise due to his work. Excavating machinery and cranes shall be of suitable type and be operated with care to prevent injury to trees not to be cut, and particularly to overhanging branches and limbs.

Branches, limbs, and roots shall not be cut except by permission of the Engineer. All cutting shall be smoothly and neatly done without splitting or crushing. In case of cutting or unavoidable injury to branches, limbs, and trunks of trees, the cut or injured portions shall be neatly trimmed and covered with an application of grafting wax or tree-healing paint, as directed.

Cultivated hedges, shrubs, and plant that might be injured by the Contractor's operations shall be protected by suitable means or shall be dug up and temporarily replanted and maintained. After the construction operations have been substantially completed, they shall be replanted in their original positions and cared for until growth is re-established. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced by items of kind and quality at least equal to the kind and quality existing at the start of the work.

On paved surfaces, the Contractor shall not use or operate tractors, bulldozers, or other power-operated equipment, the treads of wheels that are so shaped as to cut or otherwise injure such surfaces.

002.5 Clearing: From areas to be cleared, the Contractor shall cut or otherwise remove all trees, saplings, brush, vines, and other vegetable matter such as snags, sawdust, bark, etc., and refuse. The area to be cleared shall be confined to the width shown on the plans or as stipulated in the Proposal. Vines, brush, and similar undergrowth shall be cut as close to the ground as practicable. Trees may be cut leaving a longer stump to facilitate their removal by power-operated equipment. No trees shall be cut or trimmed unless they are so indicated on the drawings.

Clearing shall also include removal and disposal of all items shown on the plans to be removed, or directed by the Engineer to be removed as part of the project, including, but not limited to, removal and disposal of existing concrete sidewalk, removal of abandoned fire suppression equipment, concrete steps, drainage structures, fences, and any and all other structures or materials not specifically listed in the Bid Proposal but required to be removed to accomplish the work.

All road signs, mail boxes, etc., shall be removed and reset as directed.

002.6 Grubbing: Grubbing shall consist of the complete removal of all tree stumps and roots larger than two inches in diameter to a minimum depth of 12-inches below the subgrade surface. All excavations made below the finished surface by the removal of trees, stumps, etc. shall be filled with suitable material and thoroughly compacted in such a manner that its surface will conform to the surrounding surface.

Stump grinding shall be used for stump removal where the potential for damage to adjacent improvements or underground utilities exists due to the excavation of stumps, or as directed by the Engineer. The requirements for grubbing noted above shall also apply to stump grinding operations.

002.7 Disposal: All materials removed during trimming, tree removal, and clearing and grubbing operations shall be disposed of by the Contractor in a manner satisfactory to the Engineer.

002.8 Payment: Except as provided otherwise in the Bid Proposal or Special Conditions, this work shall be paid for at the Contract Lump Sum Price for “Preparation of Site”, which price shall include protection of existing trees and vegetation, tree removal and tree trimming under the supervision of a Connecticut Licensed Arborist, clearing and grubbing within the limits of the work, stump grinding, removal and disposal of trees, roots, stumps, brush, concrete steps, and other objects, leveling of areas to accommodate the work, and all labor, materials, tools, and equipment necessary thereto.

004.0 TEST PITS

004.01 General: The work covered under this item includes furnishing of all plant, labor, equipment, appliances, materials and incidentals and performing all operations in connection with excavating and backfilling by machine and/or by hand, exploratory test pits at locations indicated or directed. The purpose of the test pits is for locating and examining soils, ground water, drains, pipes, rocks, utilities, structure foundations or any other obstacles.

004.02 Execution:

A. Test pit excavations shall have neat, clean-cut and vertical sides. Upon completion of the test pit excavation, the Engineer shall be notified so that he can make the necessary location measurements. Excavation and backfilling shall conform to the applicable requirements of the Section entitled, "Trench Excavation - earth and backfill". Hand digging shall be employed when required by the Engineer.

B. It shall be agreed that the Contractor entered into this contract with full knowledge that in any work involving excavation, operation in public highways or adjacent to other developments, some unforeseen utility relocations, obstacles, difficulties, unforeseen soil or groundwater conditions, etc., may be encountered, and that the Contractor has included in his bid and contract obligations the assumptions of the risks and costs to which such obstacles, etc., may subject him.

004.03 Method of Measurement: Excavation for test pits will be measured for payment per each complete, within the limits ordered by the Engineer.

004.04 Basis of Payment: Payment for Test Pits shall be made at the contract bid price "each" as listed in the bid proposal, which price shall include the excavation and backfill, all materials, all labor, equipment and incidentals and the restoration of property including temporary hot mix asphalt pavement replacement. Where permanent pavement is necessary it shall be paid under the appropriate bid item.

103.0 ROCK EXCAVATION AND DISPOSAL

103.1 General: The Contractor shall excavate rock (as defined below), if encountered, to the lines and grades indicated on the drawings or as directed, shall dispose of the excavated material, and shall furnish acceptable material for backfill in place of the excavated rock.

In general, rock in pipe trenches shall be excavated so as to be not less than 6 inches from the pipe after it has been laid. Before the pipe is laid, the trench shall be backfilled to the correct subgrade with thoroughly compacted, suitable material or, when so specified or indicated on the drawings, with the same material as that required for bedding the pipe, furnished and placed at the expense of the Contractor.

Definition of Rock: The work "rock", whenever used as the name of an excavated material or material to be excavated, shall mean only boulders and pieces of concrete or masonry exceeding one-half (½) cubic yard in volume, or solid ledge which, in the opinion of the Engineer, requires for its removal drilling, and blasting, wedging, sledging, barring, or breaking up with a power-operated tool. No soft or disintegrated rock that can be removed with a hand pick or power-operated excavator or shovel, no loose, shaken, or previously blasted rock or broken stone in rock filings or elsewhere, and no rock exterior to the maximum limits of measurement allowed that may fall into the excavation will be measured or allowed as "rock".

103.2 Excess Rock Excavation: If rock is excavated beyond the limits of payment indicated on the drawings, specified, or authorized in writing by the Engineer, the excess excavation, whether resulting from overbreakage or other causes, shall be backfilled by and at the expense of the Contractor as specified before in this Section.

In pipe trenches, excess excavation below the elevation of the top of the bedding cradle or envelope shall be filled with material of the same type, placed and compacted in the same manner as specified for the bedding, cradle, or envelope.

In excavations for structures, excess excavation in the rock beneath foundations shall be filled with concrete which shall be Class A or Class B, at the option of the Contractor. Other excess excavation shall be filled with earth as specified in the Section entitled "Backfilling Around Structures" under BACKFILLING AND CONSOLIDATION.

103.3 Blasting: If explosives are used, all requirements for transportation, use and storage of Local, State, and Federal laws and regulations must be complied with and all necessary permits and licenses obtained by the Contractor at his expense. Permits and licenses must be shown to the Engineer upon request. Permits are issued through the Town of Glastonbury Fire Marshalls Office, and may require a pre / post blast survey.

Explosives must be carefully transported, stored, handled, and used. The Contractor will keep on the job only such quantities of explosives as may be needed for the work underway and only during such time as they are being used. Explosives shall be stored in a secure manner in locked containers and separate from all tools. Caps and detonators shall be stored separately from other explosives. When the need for explosives is ended, all such material remaining on the job shall be promptly removed from the premises. Care must be taken that no explosives, caps, or detonators are stolen or get into the hands of unauthorized persons, or left unguarded where they may cause accidents.

Explosives shall be of such power and placed and used in such quantities as will not make the excavation unduly large or shatter unnecessarily the rock upon or against

which the main or structure is to be built, or injure adjacent persons or property, those portions of the new work or structure as may already be in place, or other adjacent pipes, ducts, or other structures. The quantity of explosives fired at one blast must be small enough and the tie for blasting selected to avoid undue annoyance to persons owning or occupying the premises near the work.

The rock must be completely matted when blasts are fired to prevent damage or injury to persons or property or the scattering of broken fragments on the adjacent ground. Adequate warning shall be given to all persons in the vicinity before any blast is discharged.

When blasting is required, the operation shall be conducted with such care as not to cause damage to any of the existing underground utilities. Should such occur, the cost of repairs shall be the sole responsibility of the Contractor.

The Contractor shall notify each public utility or others having structures in proximity to the site, and others who may be affected, of his intention to use explosives. Said notice shall be given in accordance with the applicable regulations therefore, and sufficiently in advance to enable the involved agencies/companies/persons and the Contractor to take such steps as may be necessary to protect life and property. Such notice shall not, in any way, relieve the Contractor of responsibility for any damage resulting from his blasting operations.

When in sufficiently close proximity to existing gas, water, sanitary, storm, or other utilities and structures, and all services connected thereto, the Contractor shall remove the rock by methods other than blasting, if necessary, in order to protect said utilities and their services from damage. Approved methods other than blasting are barring and wedging, jackhammer, drilling, rock jacks, or other such hand or machinery methods that will not damage the adjacent utility.

No explosives shall be brought into, stored, or used on the site of any job by the Contractor unless and until he shall have furnished the Engineer with a satisfactory Certificate of Insurance showing that the risks arising from the presence of and use of explosives, and from blasting, are included within the insurance provided by the Contractor to secure his obligations to the Town. Insurance should also cover damage to underground utilities or other underground facilities.

When blasting for trench excavation, each shot sequence shall begin sufficiently ahead of completed work to prevent damage to the completed work, which must be properly protected prior to each shot.

The provisions herein shall apply where soil formation resembles rock, whether in trench, structure, or general excavation, even if it is of such nature that it is not classified and paid for as rock excavation and, if so ordered by the Engineer, will apply to openings cut through masonry, nested boulders, or other materials not herein classified as rock.

103.4 Blasting Records: An accurate blasting log must be maintained continuously for the duration of the Contract. The log shall record, for each shot, the location, amount of holes, depth, spacing, exact date and time of the blast, amount of explosives per hole, and the number of caps used. In addition, a sketch showing displacement of direct and delay caps for each shot shall be recorded.

103.5 Test Blasting and Monitoring Program: The Contractor shall employ an acceptable, independent vibration/blasting consultant to conduct test blasting prior to production blasting to devise suitable blasting procedures for production blasting, and to monitor

production blasting. The vibration/blasting consultant shall be a Registered Professional Engineer in the State of Connecticut and shall have a minimum of ten years experience as a vibration/blasting consultant. The Contractor shall submit the name of the vibration/blasting consultant to the Engineer prior to starting the work.

The purpose of the test blasting is to develop control procedures for production blasting so that no disturbance or damage shall be done to utilities, equipment, buildings, structures, groundwater wells, or the aquifer.

Based on the results of the test blasting, the vibration/blasting consultant shall develop a suitable blasting program and distance-quantity of explosive tables of the production blasting. The blasting program and the distance-quantity tables shall be submitted to the Engineer 21 days prior to the commencement of production blasting. All production blasting operations shall be in accordance with the blasting program.

The vibration/blasting consultant shall also perform continuous monitoring of all initial blasting operations and intermittent monitoring of subsequent blasting, as deemed necessary by the vibration/blasting consultant. Blasts shall be monitored with a minimum of two 3-component seismometers that record the entire particle velocity wave train and not just peak velocities. Accurate, legible seismometer records of all monitored blasts shall be obtained, and one copy of all blast records shall be submitted to the Engineer within seven days after blasting.

103.6 Wells: The Contractor's attention is directed to the existence of active groundwater supply wells near the area of construction. The Contractor shall locate all wells within or near the project area that could be affected by his operations.

The Contractor shall conduct his operations so that no disturbance or damage shall be done to the groundwater supply wells or to the aquifer from which they draw water. The aquifer is herein defined as underlying soil and rock formations within a distance of 1,500 feet from the wells and the groundwater within those formations.

The Contractor shall be fully responsible for determining the methods and controls necessary so that his construction operations do not disturb groundwater wells or the aquifer, and do not change the quality or quantity of water reaching the well.

If evidence of a change in well water quality or well yield, or disturbance or damage to any utility, equipment, building, or structure is observed or reported to the Contractor, he shall immediately notify the Engineer and all blasting operations shall be discontinued and the Contractor's vibration/blasting consultant shall recommend revised blasting procedures. The Contractor shall initiate the revised procedures, once approved by the Engineer, before blasting is continued.

The Contractor shall furnish potable water to any home where the well is disrupted or the water is declared unfit for human consumption. The water shall be supplied in such quantity as necessary to allow the homeowner to function on a normal day-to-day basis without any significant inconvenience or expense. The water shall be delivered as frequently as necessary to assure its freshness. The Contractor shall continue to furnish water until the problem is resolved.

The Contractor shall be fully responsible for the restoration or replacement of all water supply wells, utilities, equipment, buildings, or structures damaged by his operations at no cost to the Town.

103.7 Shattered Rock: If the rock below normal depth is shattered due to drilling or blasting operations of the Contractor and the Engineer considers such shattered rock to be unfit for foundations, the shattered rock shall be removed and the excavation shall be backfilled with concrete as required, except that in pipe trenches, screened gravel may be used for backfill, if approved. All such removal and backfilling shall be done by and at the expense of the Contractor.

103.8 Preparation of Rock Surfaces: Whenever so directed during the progress of the work, the Contractor shall remove all dirt and loose rock from designated areas and shall clean the surface of the rock thoroughly using steam to melt snow and ice, if necessary. Water in depressions shall then be removed, as required, so that the whole surface of the designated area can be inspected to determine whether seams or other defects exist.

The surfaces of rock foundations shall be left sufficiently rough to bond well with the masonry and embankments to be built thereon and, if required, shall be cut to rough benches or steps.

Before any masonry or embankment is built on or against the rock, the rock shall be scrupulously freed from all vegetation, fragments, ice, snow, and other objectionable substances. Picking, barring, wedging, streams of water under sufficient pressure, stiff brushes, hammers, steam jets, and other effective means shall be used to accomplish this cleaning. All free water left on the surface of the rock shall be removed.

103.9 Removal of Boulders: Piles of boulders or loose rock encountered within the limits of earth embankments shall be removed to a suitable place of disposal.

103.10 Disposal of Excavated Rock: Excavated rock may be used in backfilling trenches subject to the following limitations:

a. Pieces of rock larger than permitted under the section entitled “Backfilling Pipe Trenches” shall not be used for this purpose.

b. The quantity of rock used as backfill in any location shall not be so great as to result in the formation of voids.

c. Rock backfill shall not be placed within 18 inches of the surface of the finished grade.

d. Surplus excavated rock shall be disposed of as specified for surplus excavated earth.

103.11 Backfilling Rock Excavations: Where the rock has been excavated and the excavation is to be backfilled, the backfilling above normal depth shall be done as specified under EARTH EXCAVATION BACKFILL. If material suitable for backfilling is not available in sufficient quantity from other excavations, the Contractor shall, at his own expense, furnish suitable material from outside sources.

103.12 Compaction of Backfill Material: Consolidation of backfill material in a trench where rock has been blasted shall be obtained through the use of a water-jetting method, or as approved by the Engineer.

103.13 Measurement and Payment: Where rock (as defined in this Section) is encountered, it shall be stripped of the overlaying material and the Engineer will measure the same. All rock excavated before the Engineer shall have examined it shall be estimated by the Engineer based on obvious evidence of rock.

The quantity of rock excavation to be paid for shall be the number of cubic yards of rock in place, as if measured before excavation, that would have been removed if the excavation had been made everywhere exactly to the lines of payment shown in the Section entitled “Earth Trench Excavation”, Table 3-1.

At manholes, catch basins, or other structures, rock excavation will be paid for on lines 12 inches beyond the outermost dimension of the structure.

105.0 PERMANENT PAVEMENT REPAIR

105.1 General: The Contractor shall furnish all labor, materials, tools, and equipment necessary and shall construct all permanent pavement to replace pavement removed or damaged by his operations and in proposed areas of full depth reconstruction as herein specified and as directed.

Prior to excavation in paved areas, the Contractor shall cut the surface of the existing pavement in as straight a line as possible on both sides of the proposed trench for the entire length of the job.

In the replacement of pavement, the Contractor shall not feather the edges between the new and existing pavement. Materials and methods of construction shall conform, insofar as applicable, to the Form 816.

105.2 Process Stone Base Course: The Contractor shall furnish and place the pavement base course on not less than fourteen (14) inches compacted thickness of an acceptable processed stone. Care should be taken to prevent the separation of the fines from the aggregate during dumping and grading operations. The Contractor shall apply water to the base, as needed, to obtain the desired compaction.

105.3 Permanent Paving: Permanent pavement shall consist of one and a half (1.5) inches of bituminous class 2 top course, two (2) inches of bituminous class 1 binder, on top of the previously prepared processed stone base.

All binder courses shall conform to the Form 816, Section 4.06, and all top courses shall conform to the Form 816, Section 4.06.

All depth measurements shall be considered to be compacted depths. Bituminous material shall be compacted to 90% density.

All joints shall be sealed with a hot bituminous asphalt sealer approved by the Engineer.

The Contractor shall remove and acceptably dispose of all excavated material before proceeding with the remainder of the work.

Permanent pavement, in all cases, shall be applied so that the whole roadway or paved area shall have a true and uniform surface, and the pavement shall conform to the proper grade and cross-section with a smooth transition to existing pavement.

105.4 Surface Maintenance: Until the expiration of the guarantee period, the Contractor shall maintain surfacing placed under this Contract and shall promptly correct any defect such as cracks, depressions, and holes that may occur. At all times, the surfacing shall be kept in a safe and satisfactory condition for traffic. If defects occur in surfacing constructed by the Contractor, the Contractor shall remove all bituminous concrete and base course as necessary to properly correct the defect. The Contractor shall replace the base course and bituminous concrete as specified herein.

105.5 Measurement and Payment: Permanent pavement repairs will be measured and paid by the square yard complete in place to the depth as indicated within these specifications or as directed by the Engineer. This item shall include removal of temporary pavement, excavation, process stone base course, bituminous concrete binder and top courses, saw cutting, compaction, sealing joints, and all other labor, equipment, and materials incidental thereto.

106.0 EARTH EXCAVATION

106.1 General: This item shall conform to Section 2.02 ROADWAY EXCAVATION, FORMATION OF EMBANKMENT AND DISPOSAL OF SURPLUS MATERIAL, of the Form 816 amended as follows:

Section 2.02.05 of the Form 816 shall be amended to read as follows:

"The work of cutting bituminous concrete pavement, concrete pavement, or concrete sidewalks shall not be measured for payment. The work of removal of all bituminous concrete pavement, concrete sidewalks, and bituminous covered concrete, shall be paid for at the contract unit price per square yard for “Removal of Pavement” as contained in the bid proposal. Earth excavation for sidewalk construction will not be paid for separately, as described elsewhere in these specifications.

106.2 Measurement & Payment: This item will not be measured for payment.

NOTE: All surplus earth materials shall be hauled off-site by the contractor and shall become property of the contractor. There shall be no separate payment for transportation or disposal of any surplus materials.

113.0 BITUMINOUS CONCRETE LIP CURBING

113.1 General: This item shall conform to Section 8.15 BITUMINOUS CONCRETE LIP CURBING, of the Form 816.

201.0 CONCRETE SIDEWALKS

201.1 General: The Contractor is to construct sidewalks to lines and grades as shown on the drawings or at locations as directed by the Engineer. The sidewalks shall be of monolithic construction and five inches thick, except at industrial and commercial driveways where it shall be eight inches thick and reinforced with 6" x 6" 10/10 steel mesh. Sidewalk construction shall include the removal of existing and construction of new house lateral walks where new sidewalk grades make it necessary. At street corners where the intersection is rounded with a radius of less than 25 feet to the curb, the sidewalk slabs will be a minimum of five feet in length and constructed of five-inch thick concrete. The sidewalk shall pitch to the street at a slope of ¼-inch per foot or as directed by the Engineer.

Pedestrian sidewalk ramps are to be constructed to the lines and grades shown on the plans at locations directed by the Engineer, and shall be a minimum of five inches thick. This work shall also include furnishing and installing Detectable Warning Strips in the locations and to the dimensions and details shown on the plans or as ordered by the Engineer.

201.2 Forms: The forms used shall be five-inch steel or 2" x 6" wood firmly supported and staked to the line and grade given by the Engineer. The forms shall be free from warp and shall be of sufficient strength to resist springing out of shape. All forms shall be cleaned and oiled before use.

201.3 Concrete: The concrete furnished shall conform with respect to composition, transportation, mixing and placing, to Class F Cement Concrete 4,000 PSI, as specified by the State of Connecticut Department of Transportation in its latest specification and revisions. An approved air-entraining admixture shall be used to entrain 5% to 7% air in the concrete.

201.4 Detectable Warning Strips: The Detectable Warning Strip shall be a prefabricated detectable warning surface tile as manufactured from Engineered Plastics Inc. 300 International Drive, Suite 100 Williamsville, NY 14221, telephone number (800) 682-2525 or the approved equal from ADA Fabricators, INC. P.O Box 179 North Billerica, MA 01862 telephone number (978) 262-9900. The tile shall conform to the dimensions shown on the plans and have a brick red homogeneous color throughout in compliance with Federal Standard 595A Color #22144 or approved equal.

The Detectable Warning Strip shall be set directly in poured concrete according to the plans and the manufacturer's specifications or as directed by the Engineer. The Contractor shall place two 11.34 Kg concrete blocks or sandbags on each tile to prevent the tile from floating after installation in wet concrete.

201.5 Dowels: Smooth metal dowels, 5/8-inch in diameter, measuring 18 inches in length shall be installed using plastic sleeves within all expansion and contraction joints, concrete driveway aprons, at concrete sidewalk ramps, and at the last end section of each sidewalk slab poured at the end of each working day.

Plastic sleeves of the size required for accepting the 5/8-inch by 18-inch smooth metal dowels shall be "Speed Dowel" sleeves as manufactured by Greenstreak, 3400 Tree Court Industrial Blvd, St. Louis, MO 63122, telephone number (800) 551-5145 or approved equal. Plastic sleeves shall be installed according to manufacturer instructions and as directed by the Engineer.

Dowels are also to be installed between new and existing concrete slabs. Where new or repaired walks abut up against existing concrete sidewalks, the Contractor shall drill two holes measuring ¾-inches in diameter and 9 inches in depth into the existing concrete slab. The dowels, with plastic sleeve, shall be set into the existing sidewalk slab prior to the placement of concrete. The dowels are to be level with the latitude pitch of the sidewalk and shall conform to details of these specifications.

Smooth metal dowels shall be 5/8-inch in diameter and 18 inches in length. All metal dowels shall conform to the requirements of ASTM A615 Grade 60.

201.6 Expansion Joints: At maximum intervals of 15 feet, an expansion joint shall be placed to the full depth of the concrete slab. The material for expansion joints shall be either ¼-inch thick cork asphalt or $^{3}/_{8}$-inch thick asphalt impregnated bonded cellular fiber, or approved equal. Expansion joints of the same material shall also be placed at points abutting existing structures.

201.7 Surface Finish: The surface finish shall be struck off, forcing coarse aggregate below mortar surface. After strike-off, the surface shall be worked and floated with a wooded, aluminum, or magnesium float followed by steel troweling. The slab shall then be broomed cross-wise with a fine hair broom. The outside edges of the slab shall be edged with a ¼-inch radius tool. All edging lines shall be removed.

201.8 Curing: The Contractor shall use a liquid membrane-forming curing compound. The curing compound shall be similar or equal to Demicon "Cure Hard" with fugitive dye and shall meet the latest ASTM Specification C-156. Waterproof paper or plastic membrane are acceptable alternatives.

Newly constructed sidewalk surfaces shall be protected from all foot or vehicular traffic for a period of seven days. The Contractor shall have on the job, at all times, sufficient polyethylene film or waterproof paper to provide complete coverage in the event of rain.

201.9 Temperature: No concrete is to be placed when air temperature is below 40°F, or at 45°F and falling, unless prior approval is given by the Engineer. In the event weather conditions may be such that concrete that is not completely cured is subject to freezing, the Contractor shall provide a minimum of a six-inch layer of hay, straw, or thermal blankets for protection. Any concrete laid during cold weather that is damaged by freezing shall be the responsibility of the Contractor and shall be replaced at his expense.

201.10 Basis of Payment: Concrete Sidewalk shall be measured and paid for at the Contract unit price per square foot for "Concrete Sidewalks" as contained in the Bid Proposal, which price shall include the Base Course Underneath Sidewalks, excavation, and all other materials and all labor, tools, and equipment necessary for completion of the work.

Concrete Sidewalk Ramps shall be measured and paid for as a unit at the Contract unit price for each "Concrete Sidewalk Ramp" as contained in the Bid Proposal, which price shall include the Base Course Underneath Sidewalks, Excavation, Detectable Warning Strip, and all other materials and all labor, tools, and equipment necessary for completion of the work.

204.0 GRADING AND TOPSOILING

204.1 Description: This work shall consist of furnishing, placing, and shaping topsoil in areas shown on the plans where directed by the Engineer. The topsoil shall be placed to the depth stated in the Contract or specifications.

204.2 Material: The material shall conform to the requirements of Article M.13.01.1 of the Form 816.

204.3 Construction Methods: The areas on which topsoil is to be placed shall be graded to a reasonably true surface and cleaned of all stones, brickbats, and other unsuitable materials. After areas have been brought to proper subgrade and approved by the Engineer or his agent, loam shall be spread to a depth as indicated in the Contract, or to a depth of no less than four inches, with due allowance made for settlement. All stones, roots, debris, sod, weeds, and other undesirable material shall be removed from the topsoil. After shaping and grading, all trucks and other equipment shall be excluded from the topsoiled area to prevent excessive compaction. The Contractor shall perform such work as required to provide a friable surface for seed germination and plant growth prior to seeding.

During hauling and spreading operations, the Contractor shall immediately remove any material dumped or spilled on the shoulders or pavement.

It shall be the Contractor's responsibility to restore to line, grade, and surface all eroded areas with approved material and to keep topsoiled areas in acceptable condition until the completion of the construction work.

204.4 Payment: This work will be measured for payment by the number of square yards of area on which the placing of the topsoil has been completed and the work accepted.

The limits of payment shall be to the slope limits as shown on the plans. In the absence of slope limits, the maximum area of measurement shall be the area extending two feet behind the sidewalk and the area between the sidewalk and edge of pavement. No payment shall be made outside of these limits unless the disturbance was directed or approved by the Engineer. No payment shall be made for areas disturbed for staging, storage of materials, or other area disturbed for the convenience of the Contractor.

This work will be paid for at the Contract unit price per square yard for "Grading and Topsoiling", which price shall include all materials, equipment, tools, labor, and work incidental thereto.

205.0 TURF ESTABLISHMENT

205.1 General: The work included in this item shall consist of providing an accepted uniform stand of established perennial turf grasses or wetland vegetation by furnishing and placing fertilizer, seed, and mulch on all areas to be treated as shown on the plans or where designated by the Engineer.

The work will also include the installation of erosion control matting of the type indicated where shown on the plans or as directed by the Engineer.

205.2 Materials: The materials for this work shall conform to the requirements of Section M.13 of the Form 816, except as noted below.

Seed mix for residential lawn areas shall consist of 30% Crest Kentucky Bluegrass, 30% Baron Kentucky Bluegrass, 20% Victory II Chewings Fescue, and 20% Perennial Rye Grass.

Seed mix for other roadside areas designated for turf establishment shall consist of 70% Red Fescue, 20% Kentucky Blue Grass, and 10% Perennial Rye Grass.

The wetland seed mix to be used shall be 25% New England Roadside Matrix Wet Meadow Seed Mix and 75% New England Erosion Control / Restoration Mix, as listed within New England Wetland Plants, Inc.'s catalog or approved equal.

Erosion Control Matting shall be a product approved by the Connecticut Department of Transportation for the intended application as described in the “Qualified Products List” publication, latest edition.

Hydroseeding, when required by the Engineer, shall be performed using a homogenous slurry consisting of wood fiber mulch, fertilizer, live seed, and organic tackifiers conforming to Section M.13 of the Form 816.

Material certificates shall be provided for all materials supplied under this item.

205.3 Construction Methods: Construction Methods shall be those established as agronomically acceptable and feasible and which are approved by the Engineer.

1. Preparation of the Seedbed:
(a) Level areas, medians, interchanges and lawns: These areas shall be made friable and receptive for seeding by disking or by other approved methods to the satisfaction of the Engineer. In all cases the final prepared and seeded soil surface shall meet the lines and grades for such surface as shown in the plans, or as directed by the Engineer.

(b) Slope and Embankment Areas: These areas shall be made friable and receptive to seeding by approved methods which will not disrupt the line and grade of the slope surface. In no event will seeding be permitted on hard or crusted soil surface.

(c) All areas to be seeded shall be reasonably free from weeds taller than 3 inches. Removal of weed growth from the slope areas shall be by approved methods, including hand-mowing, which do not rut or scar the slope surface, or cause excessive disruption of the slope line or grade. Seeding on level areas shall not be permitted until substantially all weed growth is removed. Seeding on slope areas shall not be permitted without removal or cutting of weed growth except by written permission of the Engineer.

2. Seeding Season: The calendar dates for seeding shall be:
Spring—March 15 to June 15
Fall—August 15 to October 15

All disturbed soil areas shall be treated during the seeding seasons as follows:
(a) Areas at final grade: Seeding will be accomplished.
(b) "Out-of-season" seedings shall be performed in the same manner as "in-season" seedings. Since acceptable turf establishment is less likely, the Contractor shall be responsible for "in-season" reseeding until the turf stand conforms to this specification.

(c) During "out-of-season" periods unseeded areas shall be treated in accordance with Section 2.10, Water Pollution Control.

3. Seeding Methods: The seed mixture shall be applied by any agronomically acceptable procedure. The rate of application shall be no less than 175 pounds per acre or according to manufacturer instructions. Fertilizer conforming to M.13.03 shall be initially applied at a rate of 320 pounds per acre during or preceding seeding. When wood fiber mulch is used, it shall be applied in a water slurry at a rate of 2,000 pounds per acre with or immediately after the application of seed, fertilizer and limestone.

When hydroseeding is required by the Engineer, it shall be performed by a qualified Contractor who has a minimum of three year experience in the successful performance of this work and has been approved by the Engineer. Hydroseed mix shall be applied in a slurry consisting of wood fiber mulch, fertilizer, live seed, and organic tackifiers with each component applied at the rate described above. The slurry shall be hydraulically sprayed on the soil surface as required to form a blotter-like ground cover with a uniform coating. Contractor shall exercise special care as required to prevent slurry from being sprayed onto adjacent paved areas, sidewalks, buildings, or signs. All slurry sprayed onto adjacent surfaces shall be cleaned at the Contractor's expense.

When the grass seeding growth has attained a height of 6 inches, the specified areas designated herein shall be mowed to a height of 3 inches. Following mowing, all seeding grass areas (mowed and un-mowed) shall receive a uniform application of fertilizer hydraulically placed at the rate of 320 pounds per acre.

4. Compaction: The Contractor shall keep all equipment and vehicular and pedestrian traffic off areas that have been seeded to prevent excessive compaction and damage to young plants. Where such compaction has occurred, the Contractor shall rework the soil to make a suitable seedbed; then re-seed and mulch such areas with the full amounts of the specified materials, at no extra expense to the Town.

5. Stand of Perennial Turf Grasses: The Contractor shall provide and maintain a uniform stand of established turf grass or wetland vegetation having attained a height of 6 inches consisting of no less than 100 plants per square foot throughout the seeded areas until the entire project has been accepted.

6. Establishment: The Contractor shall keep all seeded areas free from weeds and debris, such as stones, cables, baling wire, and he shall mow at his own expense, on a one-time-only basis, all slopes 4:1 or less (flatter) and level turf established (seeded) areas to a height of 3 inches when the grass growth attains a height of 6 inches. Clean-up shall include, but not be limited to, the removal of all debris from the turf establishment operations on the shoulders, pavement, and/or elsewhere on adjacent properties publicly and privately owned.

7. Erosion Control Matting: Erosion control matting shall be installed following seeding where called for on the plans or as directed by the Engineer. Staples shall be installed as per Manufacturer's recommendations. Where two lengths of matting are joined, the end of the up-grade strip shall overlap the down-grade strip. The Contractor shall maintain and protect the areas with erosion control matting until such time as the turf grass is established. The Contractor shall replace or repair at his own expense any and all erosion control matting areas damaged by fire, water or other causes including the operation of construction equipment. No mowing will be required in the locations where erosion control matting is installed.

205.4 Method of Measurement: This work will be measured for payment by the number of square yards of surface area of accepted established perennial turf grass or wetland vegetation as specified or by the number of square yards surface area of seeding actually covered and as specified.

Restoration of areas disturbed for staging, storage of materials, or other area disturbed for the convenience of the Contractor will not be measured for payment.

Erosion control matting will be measured by the number of square of surface yards area of erosion control matting installed and accepted.

205.5 Basis of Payment: This work will be paid for at the contract unit price per square yard for "Turf Establishment", “Turf Establishment-Hydroseeding” or “Wetland Seeding”, which price shall include all materials, mowing, maintenance, equipment, tools, labor, and work incidental thereto. Partial payment of up to 60% may be made for work completed, but not accepted.

Erosion control matting will be paid for at the contract unit price per square yard for "Erosion Control Matting" complete in place and accepted, which price shall include the hay mulch, netting, staples, maintenance, equipment, tools, labor, and work incidental thereto.

206.0 SEDIMENTATION CONTROL SYSTEM

206.1 General: This item shall conform to Section 2.19 of the Form 816, with the following section replaced:

206.2 Basis of Payment (Section 2.19.05): Payment for this work will be made at the contract unit price per linear foot for "Sedimentation Control System" complete in place, which price shall include all materials, equipment, tools and labor incidental to the installation, maintenance, replacement, removal and disposal of the system and surplus material. No payment shall be made for the clean out of accumulated sediment.

207.0 SEDIMENT CONTROL SACK

207.1 General: This work shall consist of furnishing, installing, maintaining, and removing a sedimentation control sack for control of sediment entering catch basins within the project area as directed by the Engineer or as shown on the contract drawings.

207.2 Materials: Sediment control sacks shall be Siltsack® as manufactured by SI® Geosolutions or approved equal, and shall be manufactured from a specially designed woven polypropylene geotextile.

The sediment control sack shall be manufactured to fit the opening of the catch basin or drop inlet to be protected. Sediment control sack shall have the following features: two dump straps attached at the bottom to facilitate emptying; lifting loops shall be included as an integral part of the system to be used to lift the sedimentation control sack from the basin; sediment control sack shall have a restraint cord approximately halfway up the sack to keep the sides away from the catch basin walls, this yellow cord is also a visual means of indicating when the sack should be emptied. Once the strap is covered with sediment, sediment control sack should be emptied, cleaned and placed back into the basin.

207.3 Construction Sequence: To install the sediment control sack in the catch basin, remove the grate and place the sack in the opening. Hold out approximately six inches of the sack outside the frame. This is the area of the lifting straps. Replace the grate to hold the sack in place.

When the restraint cord is no longer visible, the sediment control sack is full and should be emptied.

To remove the sediment control sack, take two pieces of 1” diameter rebar and place through the lifting loops on each side of the sack.

To empty the sediment control sack, place it where the contents will be collected. Place the rebar through the lift straps (connected to the bottom of the sack) and lift. This will turn the sedimentation control sack inside out and empty the contents. Clean out and rinse. Return the sedimentation control sack to its original shape and place back in the basin.

The sediment control sack is reusable. Once the construction cycle is complete, the sedimentation control sack shall be removed from the basin and cleaned.

207.4 Basis of Payment: Sediment control sacks shall be paid for as a unit at the contract unit pirce listed in the Bid Proposal for each “Sedimentation Control Sack” provided and installed. Maintenance of the sediment control sacks and cleaning after completion of construction as described herein shall also to be included in this bid price.

213.0 EARTHWORK AND GRADING FOR SIDEWALK CONSTRUCTION

213.1 General: This item includes the excavation, formation of embankment, and regrading of project areas as required for construction of the proposed sidewalk to the lines and grades shown on the plans and as directed by the Engineer.

The Contractor is to exercise caution to prevent unnecessary damage to lawns, trees, bushes, or any other existing improvements. If, in the opinion of the Engineer, existing improvements are damaged due to the carelessness of the Contractor, the same shall be repaired or replaced at the Contractor's expense.

213.2 Earthwork: The Contractor shall remove and dispose of grass, rubbish, and other objectionable materials within the limits of the sidewalk construction. The Contractor shall perform all excavation necessary to construct sidewalks to the grades as shown on the construction plans. Excavation shall include the saw cutting, removal, and disposal of bituminous concrete and concrete sidewalks, driveways, and pavements, including curbing and tree roots, where necessary, due to the new sidewalk grade and as shown on the plans or as directed by the Engineer. Existing house lateral walks and driveways adjacent to the sidewalk shall be removed and base graded and prepared for a smooth connection. The Contractor shall remove and dispose of all excess material.

Suitable excavated material shall be re-used within the project limits as directed by the Engineer to form embankment for the sidewalks where required. Embankment formation shall be completed as described in Article 2.02.03 of the Form 816, and shall meet the proposed subgrade elevations described on the plans or directed by the Engineer. Excess earth materials shall become the property of the Contractor and shall be disposed of at no additional cost to the Town.

213.3 Grading Existing Topsoil: Upon completion of sidewalk construction, the Contractor is to grade the areas between sidewalks and curbs, if the typical section indicates a grass plot, and disturbed areas back of the sidewalk. The Contractor shall backfill and compact these areas so as to conform to the typical cross-section. The upper four inches of the backfill shall be loam or topsoil, loose and friable and free of sticks, rocks, roots, weeds, or other unsuitable material.

213.4 Lawn Restoration: This work will consist of restoring grass areas disturbed in the Contract work. All work will be in conformance with Section 205.0 TURF ESTABLISHMENT.

213.5 Basis of Payment:
Except as noted below, all of the above-described work under the heading of EARTHWORK AND GRADING FOR SIDEWALK CONSTRUCTION including excavation, formation of embankment, and re-grading of project areas for sidewalk construction and permanent pavement installation will not be measured for payment. Rather, this work shall be included in the Contract unit price for sidewalks, permanent pavement, or other items associated with the work.

Sawcutting, removal, and disposal of existing bituminous pavement and concrete sidewalk shall be paid for at the contract unit price per square yard for "Removal of Pavement", which price shall include all labor, material, tools, and equipment incidental thereto.

214.0 BASE COURSE UNDERNEATH SIDEWALKS

214.1 Description: The Contractor shall make the necessary excavation and furnish material for base construction under sidewalks.

214.2 Material: The material used for base course construction shall conform to the requirements of Section M.02.01 of the Form 816 for broken or crushed stone. It shall consist of sound, tough, and durable stone and shall be free of thin or elongated pieces, lumps of clay, soil, loam, or vegetative matter. All material shall be approved by the Engineer prior to its use.

214.3 Construction Method: The material for the base course shall be spread upon the prepared subgrade to such depth as to give a compacted thickness of eight inches. The material shall be uniformly spread in two layers of equal depth in the entire base course excavation and each layer shall be wetted and compacted to a firm even surface with a roller weighing not less than 500 pounds or by use of pneumatic tampers or vibratory compactors.

214.4 Basis of Payment: There will be no separate payment for this item. All of the above-described work under the heading “Base Course Underneath Sidewalks” shall be included in the Contract Unit Price for Concrete Sidewalks, Pedestrian Ramps, or the item associated thereto.

215.0 BITUMINOUS CONCRETE DRIVEWAY

215.1 Description: This item shall consist of bituminous concrete surfaced driveway constructed on a processed stonee base course in the locations and to the dimensions and details shown on the plans or as directed by the Engineer and in accordance with these specifications. This item shall also include the removal and disposal of existing bituminous pavement necessary for driveway replacement work.

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

1. Base Course: The material used for base course construction shall conform to the requirements of Section M.02.01 of the Form 816 for broken or crushed stone.

2. Bituminous Concrete Surface: Materials for this surface shall conform to the requirements of Section M.04, Class 2.

215.3 Construction Methods:

1. Sawcutting: Portions of the driveway or driveway aprons to be replaced shall be saw cut, and the existing pavement removed and disposed of by the Contractor.

2. Excavation: Excavation, including removal of any existing sidewalk, or driveway, shall be made to the required depth below the finished grade, as shown on the plans or as directed by the Engineer. All soft and yielding material shall be removed and replaced with suitable material.

3. Forms: When the bituminous concrete is spread by hand, forms shall be used. Forms shall be of metal or wood, straight, free from warp and of sufficient strength to resist springing from the impact of the roller. If made of wood, they shall be of 2-inch (38-millimeter) surfaced plank except that at sharp curves thinner material may be used; if made of metal, they shall be of an approved section. All forms shall be of a depth equal to the depth of the sidewalks or driveways and shall be securely staked, braced, and held firmly to the required line and grade. All forms shall be cleaned and oiled each time they are used.

4. Base Course: Processed stone base course shall be uniformly spread to the required depth and thoroughly compacted with a roller with a mass of not less than 500 pounds (226 kilograms).

5. Bituminous Concrete Surface: The edges of existing pavement shall be painted with an asphalt emulsion prior to the placement of permanent pavement. Hot laid bituminous concrete shall be placed so as to give a three-inch compacted surface, or a surface that has a depth equal to the existing driveway surface, whichever is greater.

This surface shall be constructed in accordance with the requirements of Section 4.06, except that the material may be spread by hand and thoroughly compacted by multiple passes of a power-driven roller weighing (with a mass) of not less than 500 pounds (226 kilograms). The finished surface shall be free from waves or depressions.

6. Backfilling and Removal of Surplus Material: The sides of the sidewalk or driveway shall be backfilled
with suitable material thoroughly compacted and finished flush with the top of the sidewalk or driveway. All surplus material shall be removed and the site left in a neat and

presentable condition to the satisfaction of the Engineer. In sections inaccessible to the roller, the base course, surface course and backfill shall be hand-tamped with tampers weighing not less than 12 pounds (with a mass of not less than 5.5 kilograms), the face of which shall not exceed 50 square inches (32,000 square millimeters) in area.
Method of Measurement: This work will be measured for payment as follows:

1. Bituminous Concrete Driveway—Bituminous Concrete Sidewalk: This work will be measured by the
actual number of square yards of completed and accepted sidewalk or driveway.

2. Excavation: Excavation below the finished grade of the sidewalk or driveway, including removal and disposal of existing bituminous concrete, backfilling, and disposal of all surplus materials will not be measured for payment; but the cost shall be included in the price bid for the sidewalk or driveway. Excavation above the finished grade of a proposed sidewalk or driveway, when necessary for the proper installation, will be classified and paid for as described in the Section 2.02 of the Form 816.

3. Base Course: This work will not be measured for payment but the cost thereof shall be included in the price bid for the sidewalk or driveway.

215.4 Basis of Payment: This work will be paid for at the contract unit price per square yard or "Bituminous Concrete Driveway," as the case may be, complete in place, which price shall include all excavation as specified above, backfill, disposal of surplus material, processed stone base course, and all equipment, tools, labor and materials incidental thereto.

216.0 REMOVE AND RESET BRICK PAVERS

216.1 Description: This specification covers the furnishing of all labor, materials, testing, submittals, tools, and equipment necessary to remove and reset brick pavers as shown on the plans or as directed by the Engineer.

216.2 Materials:

A. Bricks: Existing brick pavers shall be removed and reset.

B. Base Material: Shall be processed stone base as described elsewhere in these specifications

C. Leveling Course: The leveling course for dry set bricks shall be commercial grade crushed stone dust.

D. Edge Restraints: Edge restraints shall be snap□edge Pave Tech – Pave Edge, or approved equivalent, or as required to match existing.

216.3 Submittals: The following submittals shall be submitted to the Engineer for review and approval prior to installation:

- Gradation test results for processed stone base
- Material certification for commercial grade stone dust
- Material certification for polymeric stabilizing sand
- Manufacturer's cut sheet for edge restraints

216.4 Construction Methods: Existing brick pavers shall be carefully removed within the limits of grading and stockpiled in a safe location for re-use. Broken, chipped, or cracked pavers shall be replaced by the Contractor at no additional cost to the Town.

The construction of the processed stone base shall be as described in Section 215.0 Permanent Driveway Repairs.

Dry set brick pavers shall be installed on 8 inches of compacted processed aggregate. The leveling course shall consist of a minimum ¾ inches (maximum 1 inch) of compacted crushed stone dust. When placed, the bricks shall tightly abut each other. Exposed edges of bricks shall be set on a plastic angle edge restraint. Final setting of brick shall be with a plate compactor taking care to have sufficient material so as to not damage the brick. After compacting with masonry sand, the area shall be flushed with water to ensure that joints have been filled. Any area that shows gaps in the joints shall be recompacted and appropriately swept, misted, or flushed. All joints shall be filled with commercial grade crushed stone dust, masonry sand, or commercial grade polymeric stabilizing sand as shown on the plans or as directed by the Engineer. If the polymeric sand manufacturer specifies a water mist for setting the joints, all the brick and adjacent areas shall be swept clear of all polymeric sand residue.

216.5 Method of Measurement: Measurement for this item will be based on the number of square feet of bricks pavers reset, completed and accepted in place including excavation and materials.

216.6 Basis of Payment: This item will be paid for at the Contract Unit price per square foot for "Reset Brick Pavers" as listed in the bid proposal for brick paving constructed and accepted, including all labor, materials, testing, submittals, tools, and equipment necessary to complete the work as specified.

221.0 REMOVE AND RESET METAL BEAM RAIL END WRAP

221.1 Description: This work shall consist of removing a section of metal beam rail and reinstalling a metal beam rail end wrap on the remaining section of rail at the location indicated on the plans and as ordered by the Engineer.. Removed rail elements and posts shall be delivered to the Town Highway Garage on New London Turnpike.

221.2 Materials: When resetting rail, the Contractor shall reuse any undamaged existing rail elements, appropriate posts, delineators, and lap bolts within the Project limits, as approved by the Engineer to construct the reset rail. The Contractor shall use new materials conforming to the requirements of M.10 of the Form 816 to replace any parts of the existing rail system that are damaged or missing and cannot be obtained from other rail systems being removed or reset within the Project limits.

221.3 Construction Methods: The Construction Methods described in the Form 816 Section 9.10, 9.11, and 9.18 when applicable, shall apply to the resetting of existing rail systems. Prior to commencement of work, the Contractor and Engineer shall inventory the existing rail systems within the Project limits to determine which materials are suitable for reuse.

If resetting or removing railing, the Contractor must complete that work, including any required grading and any replacement of materials, by the end of each day's work. When it is not practical to complete such rail work by the end of the day's work, the Engineer may allow the Contractor to temporarily attach the existing rail to the new rail, concrete barrier curb or temporary terminal treatment.

221.4 Method of Measurement: Remove and Reset Rail End Wrap: This item will not be measured for payment since it is being paid for on a lump sum basis.

221.5 Basis of Payment:
Remove and Reset Metal Beam Rail End Wrap: This will be paid for at the contract lump sum price for "Remove and Reset Metal Beam Rail End Wrap" as listed in the Bid Proposal, complete in place. This price shall include the complete removal, storage and resetting of existing rail, including excavation, backfilling and disposal of surplus or unsuitable material, delivery of salvageable materials to the Town Highway Garage, and all equipment, tools and labor incidental thereto.

223.0 MODIFY STONE WALL

223.1 General: Work under this item shall consist of removing a portion of an existing stone wall located at station 2+96 to the limits described on the contract plans as required to accommodate the proposed pedestrian bridge. Work includes finishing the ends and cap of the portions of the stone wall to remain on either side of the pedestrian bridge to form neat and uniform vertical and horizontal lines and match the existing wall. Work will be performed to the limits necessary to complete the work and as approved by the Engineer prior to commencing with the work.

223.2 Materials: Stones shall consist of existing stones removed and prepared for reuse as necessary to complete the work. Cracked, deteriorated, and missing stones shall be replaced as directed by the engineer with stones conforming to Article M.11.02 for rubble masonry stone.

223.3 Construction Methods: Existing stone masonry shall be removed to the limits necessary to complete the work, approved by the Engineer prior to removal. Due precaution shall be taken to avoid damage to existing construction to remain, new construction, public utility installations or abutting property. Any damage shall be repaired by the Contractor, as directed by the Engineer, and at no cost to the Town.

The Contractor shall take necessary precautions to prevent any damage to the portions of the structure to remain. Any damage shall be repaired by the Contractor, as directed by the Engineer, and at no cost to the Town.

All material that is not salvaged for reuse due to damage or deterioration shall be considered debris. All debris shall be legally disposed of, from the site, by the Contractor.

Resetting stone masonry within Cemented Rubble Masonry construction shall conform to Article 6.06.03 of the Form 816. Resetting stone masonry with Dry Rubble Masonry construction shall conform to Article 6.07.03 of the Form 816.

223.4 Method of Measurement: Stone masonry reset under this item shall be not be measured for payment since this work is being paid for on a lump sum basis.

223.5 Basis of Payment: This work will be paid for at the contract lump sum price for “Modify Stone Wall” complete in place, including all materials, equipment, tools, labor, and miscellaneous materials and items incidental thereto.

224.0 STONE RETAINING WALL, VENEER, AND COPING

224.1 Description: These items shall consist of approved stone, laid in full mortar beds, constructed so as to fit neatly and firmly in such shapes and at such places as indicated on the plans or where directed, and in accordance with these specifications or as approved by the Engineer.

Stone retaining wall shall apply to the proposed stone retaining wall shown on the plans located from station 6+81 to 7+10 and station 7+30 to 7+55.

Stone masonry veneer and coping shall apply to the cast-in-place concrete reinforced wall located between station 7+10 and 7+30, as indicated on the contract plans for the "Protective Retaining Wall – Sidewalk Improvements, Williams Street East, Sheet 7" as prepared by Lenard Engineering, Inc.

224.2 Materials: The stone for the retaining wall, veneer, and coping shall conform as near as practical to, in size color and shape, the existing retaining wall along the driveway of #1554 Main Street. Stone shall be local stone provided by Tower Hill Quarry on New London Turnpike in Glastonbury, Connecticut or approved equal. The Contractor shall submit a sample of the stone to the Engineer for approval. Any variations shall be approved by the Engineer.

Mortar shall conform to Article M.11.04 of the Form 816.

The materials for the gravel base shall meet the requirements of Section M.02.01 of the Form 816 for broken or crushed stone.

Drainage aggregate backfill behind the wall shall consist of ¾" stone.

224.3 Construction Methods:
The stone retaining wall shall be constructed on a processed stone base and in the location and to the dimensions shown on the plans or as ordered. A foundation for the stone wall consisting of a 12-inch layer of processed stone shall be installed to limits shown on the drawings.

Stone veneer shall be installed on the 3-inch wide shelf of the cast-in-place concrete retaining wall. Masonry anchors shall be used at intervals as necessary for proper support of the veneer, as directed by the Engineer.

1. Dressing Stone: All necessary dressing or shaping of stone shall be done before the stone is laid in the wall, veneer, or coping. No dressing or hammering which will loosen the stone will be permitted after it is placed. Stones at angles or at ends of walls shall be roughly squared and dressed to the required lines.

2. Laying Stones: Stone shall not be laid when the air temperature in the shade and away from artificial heat is 40°F (5°C) or below and falling, except with the approval of the Engineer and subject to such conditions as he may impose.

The masonry shall be laid to line and in courses roughly leveled up. The bottom or foundation courses shall be composed of large, selected stones; and all courses shall be laid with bearing beds parallel to the natural bed of the material.

Each stone shall be cleaned and thoroughly saturated with water before being set. Stone shall not be dropped or slid over the wall but shall be carefully set without jarring stone

already laid. All stone shall be well bedded in freshly made mortar. The mortar joints shall be full and the stones carefully settled in place before the mortar has set. No spalls will be permitted in the beds. Joints and beds shall have an average thickness of not more than 1 1/2 inches (38 millimeters). Headers shall be placed in each course and shall have a width of not less than 1 1/2 times their thickness. They shall bond with the core or backing not less than 12 inches (300 millimeters); and in walls 2 feet (600 millimeters) or less in thickness, they shall extend entirely through the wall. Headers shall occupy not less than 1/5 of the face area of the wall and shall be evenly distributed.

Whenever possible the face joints shall be properly pointed before the mortar becomes set. Joints which cannot be so pointed shall be prepared for pointing by raking them out to a depth of about 2 inches (50 millimeters) before the mortar has set. The face surfaces of stones shall not be smeared with the mortar forced out of the joints or that used in pointing.

The vertical joints in each course shall break joints with those in adjoining courses at least 6 inches (150 millimeters). In no case shall vertical joints be so located as to occur directly above or below a header. In case any stone is moved or the joint broken, the stone shall be taken up, the mortar thoroughly cleaned from bed and joints, and the stone reset in fresh mortar.

3. Pointing: Pointing shall not be done in freezing weather or when the stones contain frost. Joints not pointed at the time the stones are laid shall be thoroughly wet with water and filled with mortar. The mortar shall be well driven into the joints and finished with an approved pointing tool. The wall shall be kept wet while pointing is being done; and in hot or dry weather, the pointed masonry shall be protected from the sun and kept wet for a period of at least three days after completion.

After the pointing is completed and the mortar set, the wall shall be thoroughly cleaned and left in a neat and workman-like condition.

224.4 Method of Measurement: The quantity of stone retaining wall or stone masonry veneer and coping shall be the actual number of square feet of wall face and coping completed and accepted, within the neat lines of the structure and payments limits described below, as shown on the plans or as ordered by the Engineer.

Vertical payment limits for the stone retaining wall face shall extend a maximum of 6 inches below finished grade. Vertical payment limits for the stone masonry veneer shall extend a maximum of 3 inches below finished grade. Payment limits for stone retaining wall capstones and coping for the stone masonry veneer and coping item shall not exceed the 12 inch width shown in the details.

Processed stone for the base of the wall and ¾" stone backfill for behind the wall shall not be measured for payment, but rather shall be included in the contract unit price for Stone Retaining Wall.

Earth excavation and backfill necessary for installation of the stone retaining wall will not be measured for payment. Masonry anchors will not be measured for payment.

224.5 Basis of Payment: The work of installing the stone retaining wall located from station 6+81 to 7+10 and station 7+30 to 7+55 will be paid for at the contract unit price per square foot for "Stone Retaining Wall" as contained in the bid proposal, complete in place, which price shall include all materials, equipment, tools, labor and work incidental thereto.

This work of installing the stone masonry veneer and coping for the cast-in-place concrete retaining wall located between station 7+10 and 7+30 will be paid for at the contract unit price per square foot for "Stone Masonry Veneer and Coping" as contained in the bid proposal, complete in place, which price shall include all materials, equipment, tools, labor and work incidental thereto.

Pay Items:	Pay Units:
Stone Retaining Wall	S.F.
Stone Masonry Veneer and Coping	S.F.

228.0 TREE PROTECTION TRENCH

228.1 Description: This work includes excavation of a tree protection trench adjacent to an existing or proposed sidewalk by means of a chain-driven trenching machine with additional pruning of roots using hand methods as required. This is performed adjacent to the proposed sidewalk excavation and within the drip line of an existing tree to cleanly sever roots prior to sidewalk excavation.

The services of a licensed arborist will be required to supervise the above referenced work and shall be included in the contract unit price for tree protection trench.

228.2 Construction Methods: Tree protection trench shall be installed in advance of the intended sidewalk construction during time periods where damage to trees will be minimized, as directed by the Engineer. The work area shall generally include the length of sidewalk within the drip line of the canopy of the tree of concern. Extreme care shall be taken by the Contractor to identify and protect underground utilities within the work area, and any conflicts shall be immediately brought to the attention of the Engineer.

Where tree protection trench is called for on the plans, the Contractor shall use a chain-driven trenching apparatus to cleanly sever tree roots adjacent to the sidewalk to the full depth of the sidewalk excavation as directed by the Engineer. Additional pruning of roots using hand methods may also be required, as directed by the Engineer or licensed arborist supervising the work.

The disturbed area shall be restored to existing grades and shall be seeded per Section 205.00 of the specifications.

228.3 Payment: Tree protection trench shall be measured for payment by the number of linear feet of tree protection trench installed and accepted. This work shall be paid for at the Contract unit price for “Tree Protection Trench”, which price shall include all materials, equipment, tools, labor, and work incidental thereto.

The services of a certified arborist to supervise work under this item shall not be measured separately for payment, but rather shall be included in the contract unit price for “Tree Protection Trench”.

Restoration of disturbed areas shall be measured and paid for under Section 205.00 Turf Establishment.

301.0 MAINTENANCE AND PROTECTION OF TRAFFIC

301.1 Description: Unless other provisions are made on the plans or in the Special Conditions, the Contractor shall keep the roadway open to traffic for the full length of the project and shall provide a sufficient number of travel lanes and pedestrian pathways to move that traffic ordinarily using the roadway. The travel lanes and pedestrian pathways shall be drained and kept reasonably smooth and in suitable condition at all times in order to provide minimum interference with traffic and consistent with proper execution of the work. Suitable ingress and egress shall be provided at all times where required for all intersecting roads and for all abutting properties that have legal access.

The Contractor shall maintain and protect traffic as follows and as limited in the SPECIAL CONDITIONS Section 17.00 Prosecution and Progress.

WILLIAMS STREET EAST

The Contractor shall maintain and protect one lane of through traffic in each direction, including turning lanes, each lane on a paved travelpath not less than 11 feet in width.

COMMERCIAL AND RESIDENTIAL DRIVEWAYS

The Contractor shall maintain access to and egress from all commercial and residential driveways throughout the project limits.

301.2 Alternate Traffic Management Schemes: When a scheme for maintenance of traffic is shown on the plans or approved by the Legal Traffic Authority, this shall govern unless an alternate scheme acceptable to the Engineer is offered by the Contractor at no additional cost. If no scheme is shown on the plans or described in the Special Conditions of the Contract and the Contractor wishes to deviate from the provisions of maintaining traffic as described in this Section, the Contractor must submit, and the Engineer may approve, a schedule showing a proposed sequence of operations and a compatible method of maintaining traffic.

301.3 Signs and Sign Patterns: The Contractor shall maintain all existing signs throughout the project limits during the duration of the project. The Contractor shall temporarily relocate signs as many times as deemed necessary as directed by the Engineer. When the necessary construction is completed, the Contractor shall re-install the existing signs in their original locations or as directed by the Engineer.

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. All temporary traffic control devices as called for by the contract or ordered by the Engineer must be on-hand and available in sufficient quantity for immediate installation prior to any stage change.

The Contractor will furnish additional approved signs, barricades, traffic cones, and traffic delineators to forewarn traffic of the construction. The Contractor will also provide such safety measures, pavement markings, warning devices, and signs as deemed necessary to safeguard and guide the traveling public through detours ordered by the Engineer or included in the approved scheme for maintenance of traffic. Signs and barricades will be delivered adjacent to the project and traffic cones and delineators will be provided when required, at no cost to the Town. The Contractor shall erect, maintain, move, adjust, relocate and store these signs, barricades, traffic cones, and delineators when, where,

and in accordance with the "Manual on Uniform Traffic Control Devices", or as directed by the Engineer.

The use of unauthorized or unapproved signs, barricades, traffic cones, or traffic delineators will not be permitted.

The Contractor shall keep all signs in proper position and clean and legible at all times. Care shall be taken so that weeds, shrubbery, construction materials or equipment, and soil are not allowed to obscure any sign, light, or barricade. Signs that do not apply to existing conditions shall be removed or adjusted so that the legend is not visible to approaching traffic.

301.4 Traffic Control During Construction Operations: The following guidelines shall assist field personnel in determining when and what type of traffic control patterns to use for various situations. These guidelines shall provide for the safe and efficient movement of traffic through work zones and enhance the safety of work forces in the work area.

TRAFFIC CONTROL PATTERNS: Traffic control patterns shall be used when a work operation requires that all or part of any vehicle or work area protrudes onto any part of a travel lane or shoulder. For each situation, the installation of traffic control devices shall be based on the speed and volume of traffic, duration of operation, and exposure to hazards.

Traffic control patterns shall be uniform, neat and orderly so as to command respect from the motorist.

In the case of a horizontal or vertical sight restriction in advance of the work area, the traffic control pattern shall be extended to provide adequate sight distance for approaching traffic.

If a lane reduction taper is required to shift traffic, the entire length of the taper should be installed on a tangent section of roadway so that the entire taper area can be seen by the motorist.

Any existing signs that are in conflict with the traffic control patterns shall be removed, covered, or turned so that they are not readable by oncoming traffic.

When installing a traffic control pattern, a Buffer Area should be provided and this area shall be free of equipment, workers, materials and parked vehicles.

Traffic control patterns will not be required when vehicles are on an emergency patrol type activity or when a short duration stop is made and the equipment can be contained within the shoulder. Flashing lights and appropriate trafficperson shall be used when required.

Although each situation must be dealt with individually, conformity with the typical traffic control plans contained herein is required. In a situation not adequately covered by the typical traffic control plans, the Contractor must contact the Engineer for assistance prior to setting up a traffic control pattern.

PLACEMENT OF SIGNS: Signs must be placed in such a position to allow motorists the opportunity to reduce their speed prior to the work area. Signs shall be installed on the same side of the roadway as the work area. On multi-lane divided highways, advance warning signs may be installed on both sides of the highway. On directional roadways

(on-ramps, off-ramps, one-way roads), where the sight distance to signs is restricted, these signs should be installed on both sides of the roadway.

Allowable Adjustment of Signs and Devices Shown on the Traffic Control Plans
The traffic control plans contained herein show the location and spacing of signs and devices under ideal conditions. Signs and devices should be installed as shown on these plans whenever possible.

The proper application of the traffic control plans and installation of traffic control devices depends on actual field conditions.

Adjustments to the traffic control plans shall be made only at the direction of the Engineer to improve the visibility of the signs and devices and to better control traffic operations. Adjustments to the traffic control plans shall be based on safety of work forces and motorists, abutting property requirements, driveways, side roads, and the vertical and horizontal curvature of the roadway.

The Engineer may require that the traffic control pattern be located significantly in advance of the work area to provide better sight line to the signing and safer traffic operations through the work zone.

Table I indicates the minimum taper length required for a lane closure based on the posted speed limit of the roadway. These taper lengths shall only be used when the recommended taper lengths shown on the traffic control plans cannot be achieved.

TABLE I – MINIMUM TAPER LENGTHS

POSTED SPEED LIMIT MILES PER HOUR	MINIMUM TAPER LENGTH IN FEET FOR A SINGLE LANE CLOSURE
30 OR LESS	180
35	250
40	320
45	540
50	600
55	660
65	780

INSTALLING AND REMOVING TRAFFIC CONTROL PATTERNS

a) Lane Closures shall be installed beginning with the advanced warning signs and proceeding forward toward the work area.
b) Lane Closures shall be removed in the reverse order, beginning at the work area, or end of the traffic control pattern, and proceeding back toward the advanced warning signs.
c) Stopping traffic may be allowed as per the contract for such activities as blasting, steel erection, etc; or during paving, milling operations, etc. where, in the middle of the operation, it is necessary to flip the pattern to complete the operation on the other half of the roadway and traffic should not travel across the longitudinal joint or difference in roadway elevation; or to move slow moving equipment across live traffic lanes into the work area.
d) Under certain situations when the safety of the traveling public and/or that of the workers may be compromised due to conditions such as traffic volume, speed, roadside obstructions, or sight line deficiencies, as determined by the Engineer and/or State Police, traffic may be briefly impeded while installing and/or

removing the advanced warning signs and the first ten traffic cones/drums only. Appropriate measures shall be taken to safely slow traffic.

e) The Contractor must adhere to using the proper signs, placing the signs correctly, and ensuring the proper spacing of signs.
f) Additional devices are required on entrance ramps, exit ramps, and intersecting roads to warn and/or move traffic into the proper travelpath prior to merging/exiting with/from the main line traffic. This shall be completed before installing the mainline pattern past the ramp or intersecting roadway.
g) Prior to installing a pattern, any conflicting existing signs shall be covered with an opaque material. Once the pattern is removed, the existing signs shall be uncovered.
h) On limited access roadways, workers are prohibited from crossing the travel lanes to install and remove signs or other devices on the opposite side of the roadway. Any signs or devices on the opposite side of the roadway shall be installed and removed separately.

USE OF TRAFFIC DRUMS AND TRAFFIC CONES

a) Traffic drums shall be used for taper channelization on limited-access roadways, ramps, and turning roadways and to delineate raised catch basins and other hazards.
b) Traffic drums shall be used in place of traffic cones in traffic control patterns that are in effect for more than a 72-hour duration.
c) Traffic Cones less than 42 inches in height shall not be used on limited-access roadways or on non-limited access roadways with a posted speed limit of 45 mph and above.
d) Typical spacing of traffic drums and/or cones shown on the Traffic Control Plans in the Contract are maximum spacings and may be reduced to meet actual field conditions as required.

301.5 Traffic Signals: The Contractor shall keep each traffic signal in the project limits operational at all times during construction. Loop detectors disturbed by the Contractor's operations shall be made operational, in accordance with the Specification Section X.XX Loop Detector Saw Cut, or temporary detection must be provided within 24 hours of the termination of the existing loop detectors.

301.6 Snow Removal: The Contractor, when order by the Engineer, shall remove snow and take care of icy conditions on temporary, new, and existing sidewalks on any part of the right-of-way within the limits of the project.

Snow removal and correction of icy conditions other than those resulting from the Contractor's operations, and snow removal on uncompleted contracts under traffic, will remain the obligation of the Town.

301.7 Failure to Provide: Should the Contractor fail to perform any of the work required under this Section, the Town may perform, or arrange for others to perform, such work. In such cases, the Town will deduct from monies due or to become due the Contractor, all expenses connected therewith.

301.8 Basis of Payment: Maintenance and Protection of Traffic will be paid for at the Contract Lump Sum price for "Maintenance and Protection of Traffic". This price shall include all costs for labor, equipment, and services involved in the erection, maintenance, moving, adjusting, relocating and storing of signs, barricades, traffic cones, and traffic delineators furnished by the Contractor, as well as all cost of labor and equipment involved in the

maintenance of traffic lanes and detours ordered or included in the approved scheme for maintenance of traffic.

The contract lump sum price for "Maintenance and Protection of Traffic" shall also include furnishing, installing, and removing the material for the temporary traversable slope in those areas where a longitudinal dropdown exists.

If there is no method for payment for the temporary transition in those areas where a transverse dropdown exists, then the contract lump sum price for the "Maintenance and Protection of Traffic" shall also include furnishing, installing, and removing the material for the temporary transition.

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

NOTE: The Town of Glastonbury **CHIEF OF POLICE**, acting in the capacity of the **LEGAL TRAFFIC AUTHORITY**, shall be the sole and final authority for the Maintenance and Protection of Traffic.

NOTES FOR TRAFFIC CONTROL PLANS

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

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

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

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

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

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

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

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

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

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

TABLE 1 - MINIMUM TAPER LENGTHS

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

METRIC CONVERSION CHART (1" = 25mm)

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

SCALE: NONE

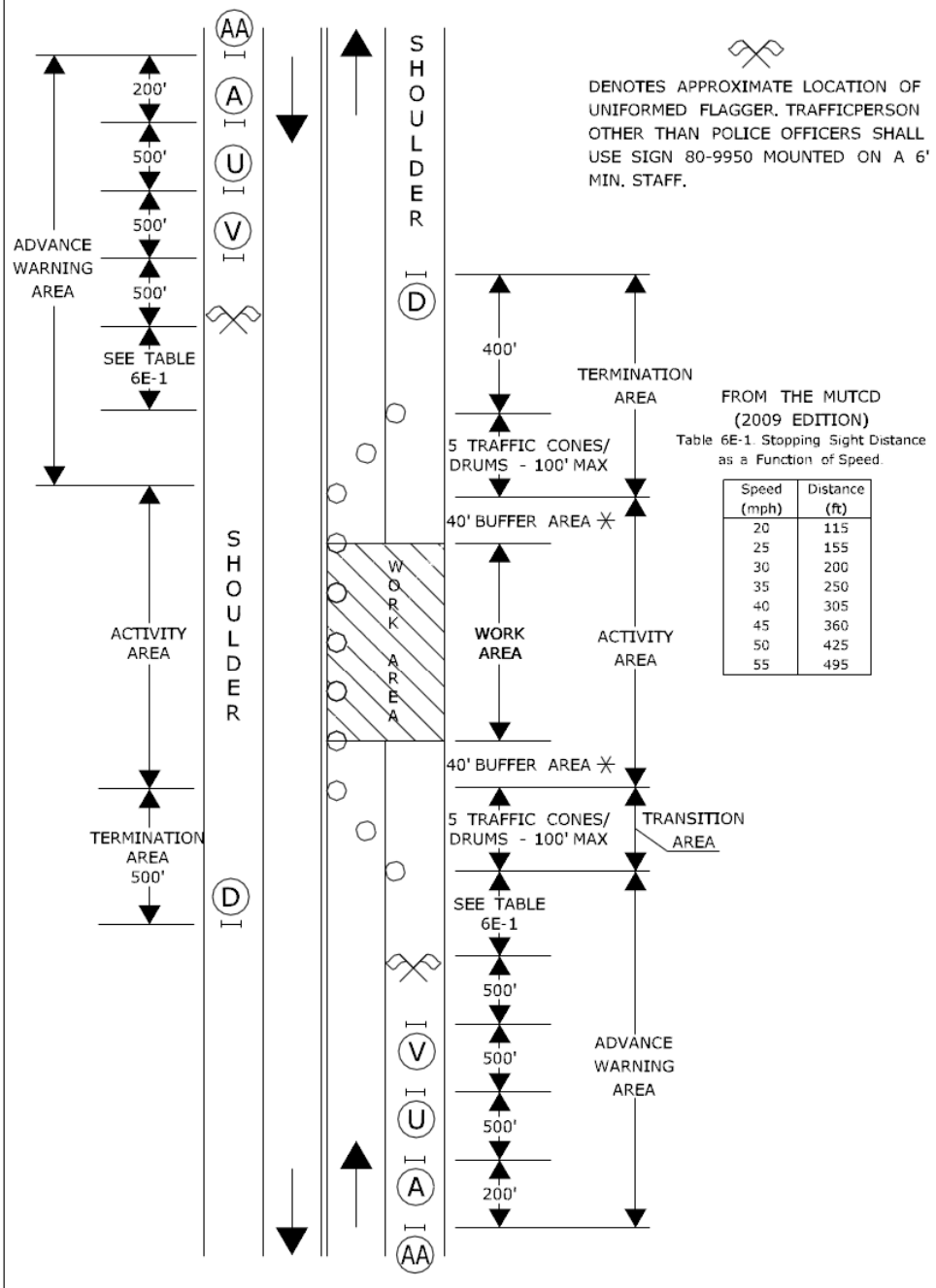
CONSTRUCTION TRAFFIC CONTROL PLAN
NOTES

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED Charles S. Harlow 2012.06.05 15:50:35-04'00'
PRINCIPAL ENGINEER

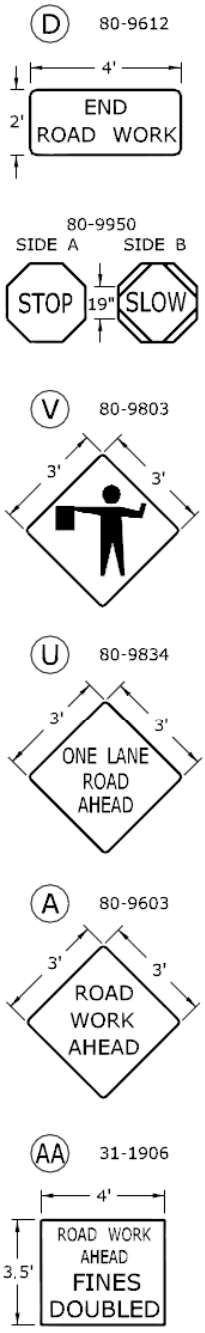
WORK IN TRAVEL LANE AND SHOULDER
TWO LANE HIGHWAY
ALTERNATING ONE-WAY TRAFFIC OPERATIONS

SIGN FACE
108 SQ. FT (MIN.)



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

Speed (mph)	Distance (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495



○ 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

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PRINCIPAL ENGINEER

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

SIGN FACE
108 SQ. FT (MIN.)

HAND SIGNAL METHODS TO BE USED BY UNIFORMED FLAGGERS

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

SIGN FACE
108 SQ. FT (MIN.)

HAND SIGNAL METHODS TO BE USED BY UNIFORMED FLAGGERS

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

A. TO STOP TRAFFIC

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

B. TO DIRECT TRAFFIC TO PROCEED

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

C. TO ALERT OR SLOW TRAFFIC

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

○ TRAFFIC CONE **OR** TRAFFIC DRUM
✳ OPTIONAL ⊗ TRAFFIC DRUM ⊢⊣ PORTABLE SIGN SUPPORT
⟵ HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW

SCALE: NONE

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

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

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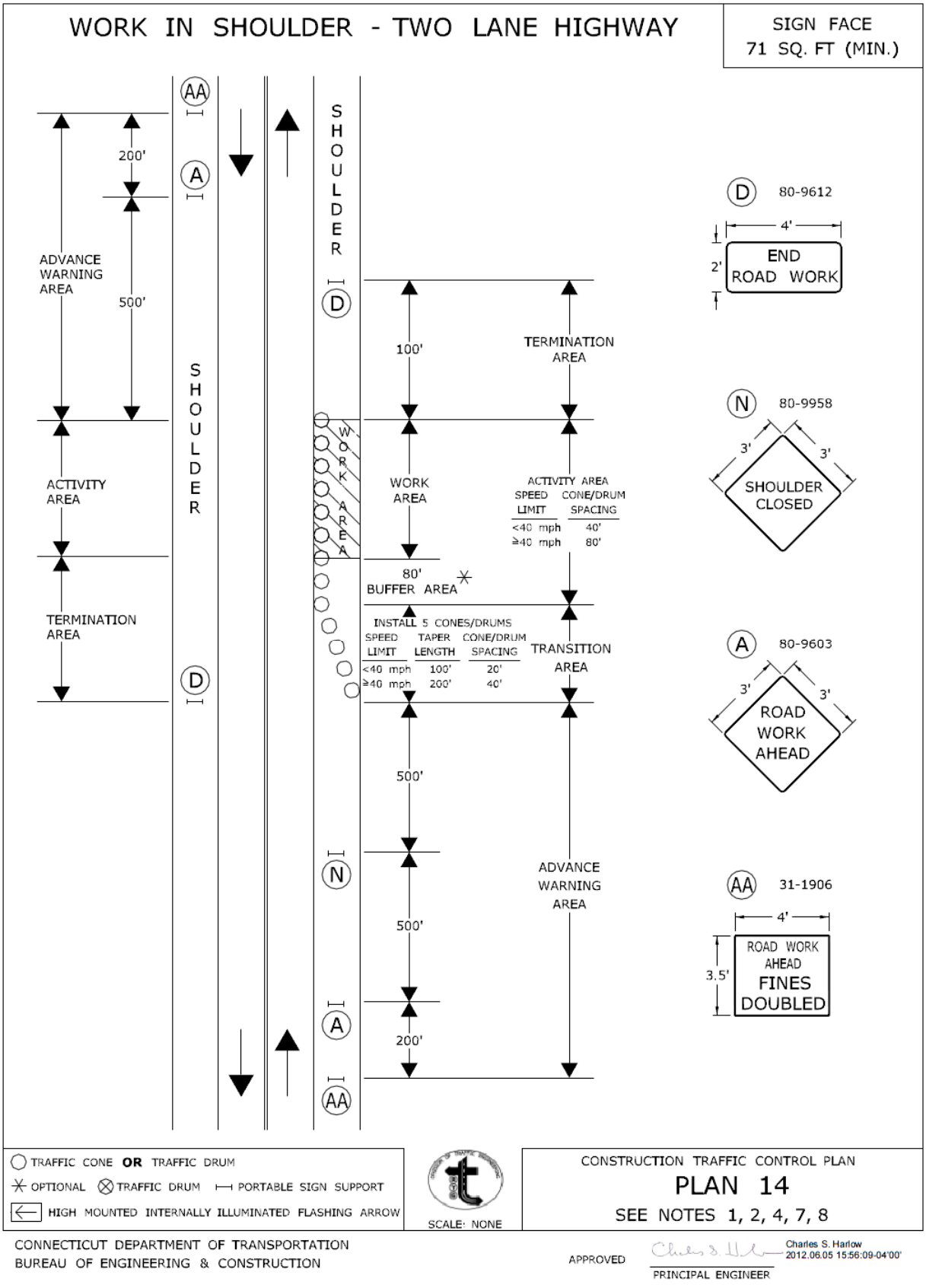
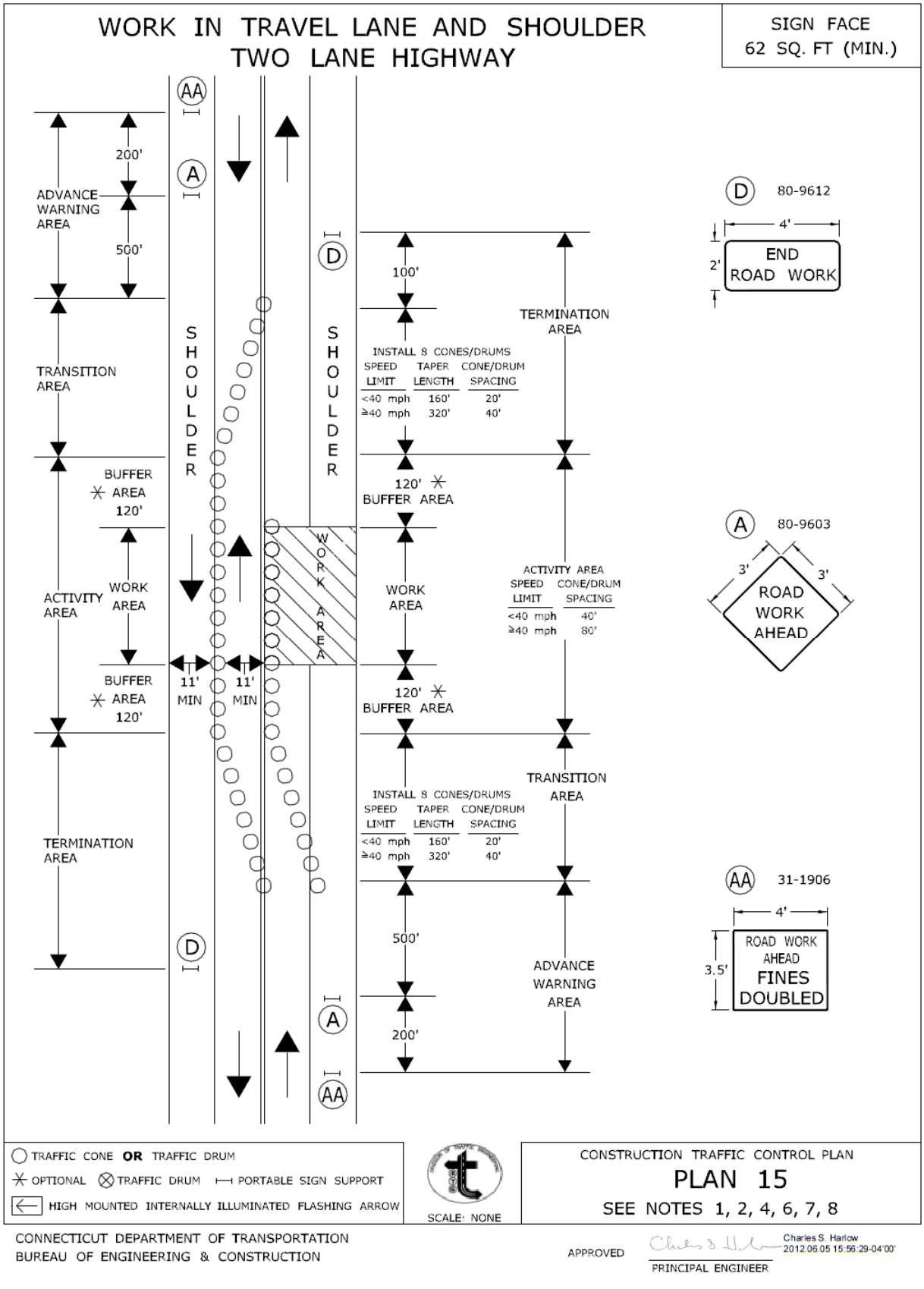
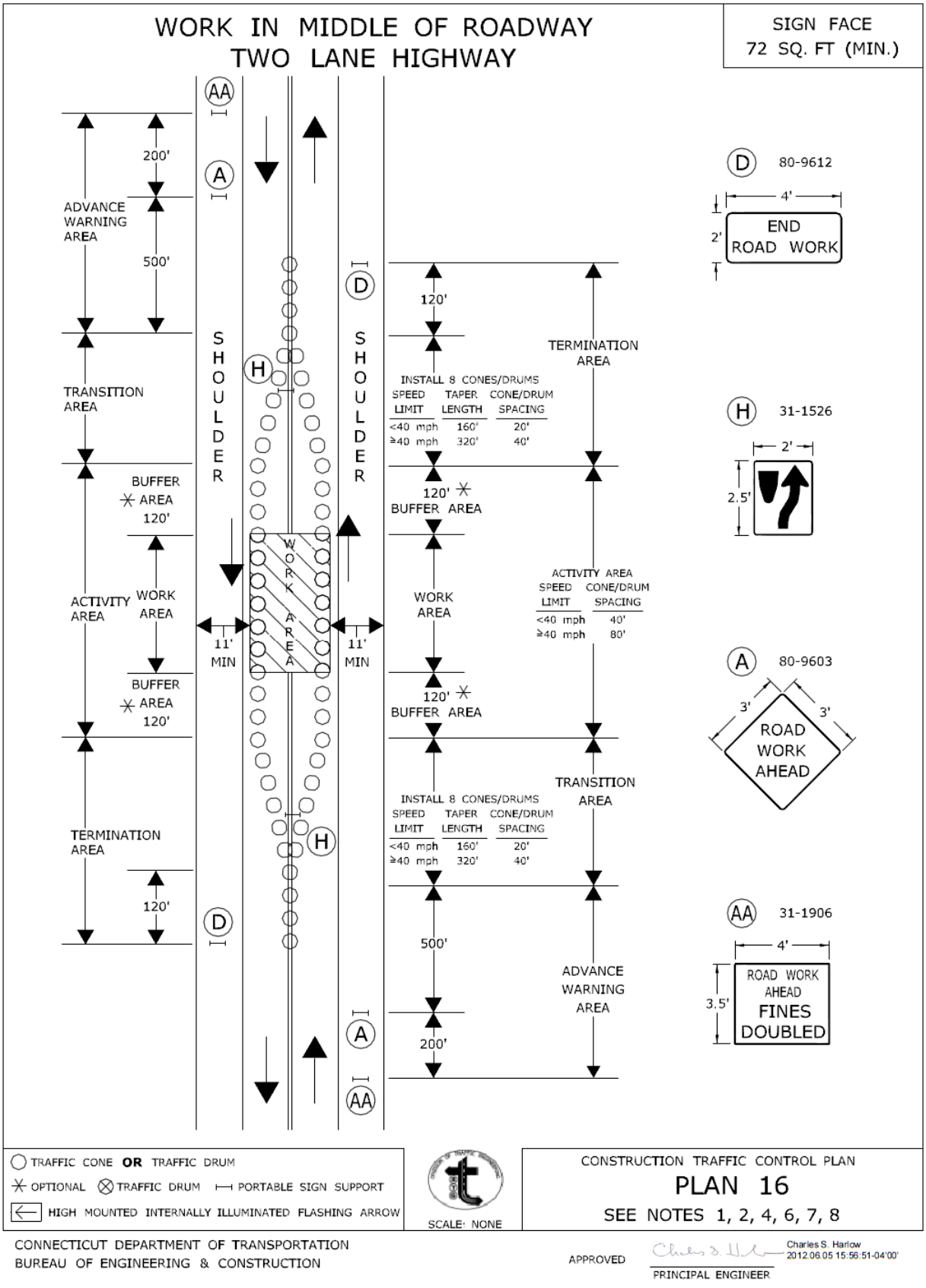
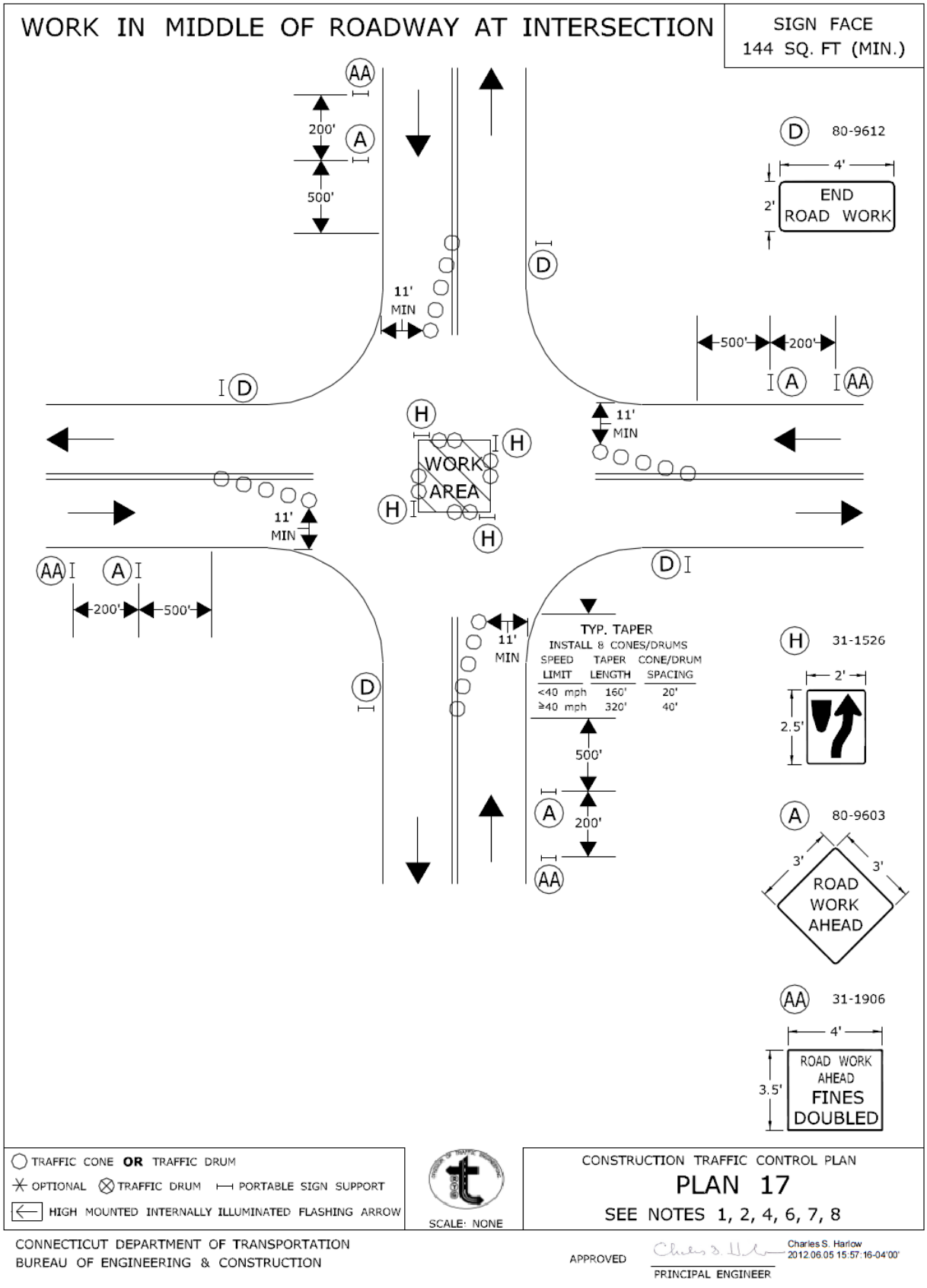
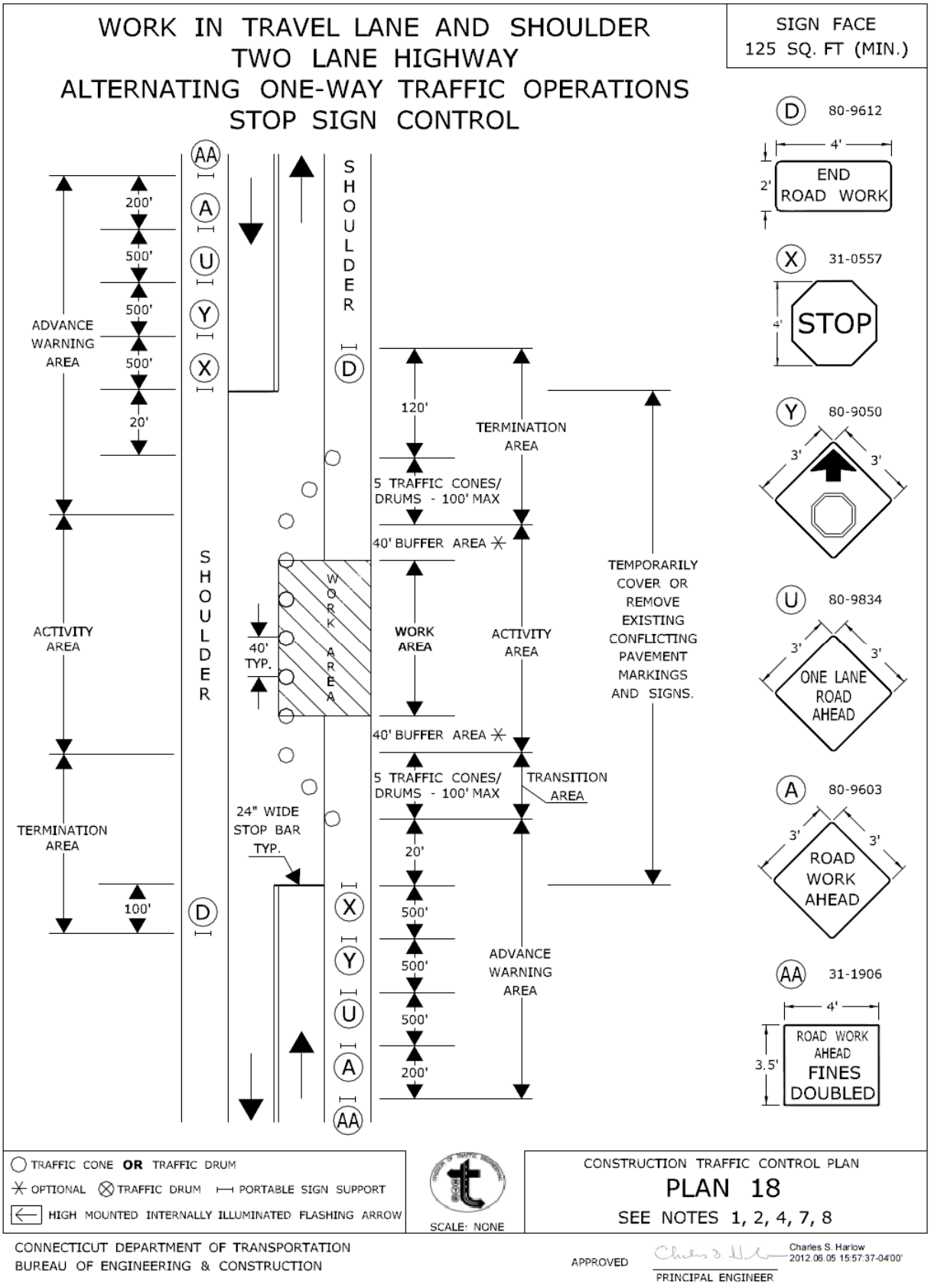
PRINCIPAL ENGINEER


WORK IN SHOULDER - TWO LANE HIGHWAY
SIGN FACE
71 SQ. FT (MIN.)
AA
A
D
N
200'
500'
ADVANCE WARNING AREA
ACTIVITY AREA
TERMINATION AREA
SHOULDER
SHOULDER
WORK AREA
100'
WORK AREA
TERMINATION AREA
ACTIVITY AREA
SPEED LIMIT
CONE/DRUM SPACING
<40 mph 40'
≥40 mph 80'
80' BUFFER AREA
INSTALL 5 CONES/DRUMS
SPEED LIMIT
TAPER LENGTH
CONE/DRUM SPACING
<40 mph 100' 20'
≥40 mph 200' 40'
TRANSITION AREA
500'
500'
ADVANCE WARNING AREA
200'
D 80-9612
4'
2'
END ROAD WORK
N 80-9958
3'
3'
SHOULDER CLOSED
A 80-9603
3'
3'
ROAD WORK AHEAD
AA 31-1906
4'
3.5'
ROAD WORK AHEAD
FINES DOUBLED
TRAFFIC CONE OR TRAFFIC DRUM
OPTIONAL
TRAFFIC DRUM
PORTABLE SIGN SUPPORT
HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW
SCALE: NONE
CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 14
SEE NOTES 1, 2, 4, 7, 8
CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION
APPROVED
Charles S. Harlow
2012.06.05 15:56:09-04'00'
PRINCIPAL ENGINEER


WORK IN TRAVEL LANE AND SHOULDER
TWO LANE HIGHWAY
SIGN FACE
62 SQ. FT (MIN.)
AA
A
D
200'
ADVANCE WARNING AREA
500'
TRANSITION AREA
BUFFER AREA 120'
ACTIVITY AREA
WORK AREA
BUFFER AREA 120'
TERMINATION AREA
SHOULDER
SHOULDER
WORK AREA
11' MIN
11' MIN
100'
INSTALL 8 CONES/DRUMS
SPEED LIMIT | TAPER LENGTH | CONE/DRUM SPACING
<40 mph | 160' | 20'
≥40 mph | 320' | 40'
120' BUFFER AREA
WORK AREA
120' BUFFER AREA
INSTALL 8 CONES/DRUMS
SPEED LIMIT | TAPER LENGTH | CONE/DRUM SPACING
<40 mph | 160' | 20'
≥40 mph | 320' | 40'
500'
200'
TERMINATION AREA
ACTIVITY AREA
SPEED LIMIT | CONE/DRUM SPACING
<40 mph | 40'
≥40 mph | 80'
TRANSITION AREA
ADVANCE WARNING AREA
D 80-9612
4'
2'
END ROAD WORK
A 80-9603
3'
3'
ROAD WORK AHEAD
AA 31-1906
4'
3.5'
ROAD WORK AHEAD
FINES DOUBLED
TRAFFIC CONE OR TRAFFIC DRUM
OPTIONAL
TRAFFIC DRUM
PORTABLE SIGN SUPPORT
HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW
SCALE: NONE
CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 15
SEE NOTES 1, 2, 4, 6, 7, 8
CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION
APPROVED
PRINCIPAL ENGINEER
Charles S. Harlow
2012.06.05 15:56:29-04'00'


WORK IN MIDDLE OF ROADWAY
TWO LANE HIGHWAY
SIGN FACE
72 SQ. FT (MIN.)
ADVANCE WARNING AREA
200'
500'
TRANSITION AREA
BUFFER AREA
120'
ACTIVITY AREA
WORK AREA
BUFFER AREA
120'
TERMINATION AREA
120'
SHOULDER
SHOULDER
11' MIN
11' MIN
WORK AREA
120'
INSTALL 8 CONES/DRUMS
SPEED LIMIT | TAPER LENGTH | CONE/DRUM SPACING
<40 mph | 160' | 20'
≥40 mph | 320' | 40'
120' BUFFER AREA
TERMINATION AREA
ACTIVITY AREA
SPEED LIMIT | CONE/DRUM SPACING
<40 mph | 40'
≥40 mph | 80'
120' BUFFER AREA
INSTALL 8 CONES/DRUMS
SPEED LIMIT | TAPER LENGTH | CONE/DRUM SPACING
<40 mph | 160' | 20'
≥40 mph | 320' | 40'
TRANSITION AREA
500'
200'
ADVANCE WARNING AREA
D 80-9612
4'
2'
END ROAD WORK
H 31-1526
2'
2.5'
A 80-9603
3'
3'
ROAD WORK AHEAD
AA 31-1906
4'
3.5'
ROAD WORK AHEAD
FINES DOUBLED
TRAFFIC CONE OR TRAFFIC DRUM
OPTIONAL
TRAFFIC DRUM
PORTABLE SIGN SUPPORT
HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW
SCALE: NONE
CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 16
SEE NOTES 1, 2, 4, 6, 7, 8
CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION
APPROVED
Charles S. Harlow
2012.06.05 15:56:51-04'00'
PRINCIPAL ENGINEER


WORK IN MIDDLE OF ROADWAY AT INTERSECTION
SIGN FACE
144 SQ. FT (MIN.)
AA
200'
A
500'
D
80-9612
4'
2'
END
ROAD WORK
11'
MIN
D
500'
200'
A
AA
D
11'
MIN
H
H
WORK
AREA
H
H
11'
MIN
AA
A
200'
500'
D
D
11'
MIN
TYP. TAPER
INSTALL 8 CONES/DRUMS
SPEED LIMIT | TAPER LENGTH | CONE/DRUM SPACING
<40 mph | 160' | 20'
≥40 mph | 320' | 40'
500'
A
200'
AA
H
31-1526
2'
2.5'
A
80-9603
3'
3'
ROAD
WORK
AHEAD
AA
31-1906
4'
3.5'
ROAD WORK
AHEAD
FINES
DOUBLED
TRAFFIC CONE OR TRAFFIC DRUM
OPTIONAL
TRAFFIC DRUM
PORTABLE SIGN SUPPORT
HIGH MOUNTED INTERNALLY ILLUMINATED FLASHING ARROW
SCALE: NONE
CONSTRUCTION TRAFFIC CONTROL PLAN
PLAN 17
SEE NOTES 1, 2, 4, 6, 7, 8
CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION
APPROVED
PRINCIPAL ENGINEER
Charles S. Harlow
2012.06.05 15:57:16-04'00'



CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED Charles S. Harlow 2012.06.05 15:57:37-04'00'
PRINCIPAL ENGINEER

302.0 TRAFFICPERSON

302.1 General: This item shall conform to Section 9.70 TRAFFICPERSON, of the Form 816.

302.3 Description: Add the following to the first paragraph of Section 9.70.01

"Trafficpersons shall consist of uniformed flaggers meeting acceptable criteria or extra duty officers of the Glastonbury Police Department. The Contractor shall provide Uniformed Flaggers meeting the requirements of this specification as required for safe traffic operations in the project area. Extra-duty police officers will be used only when specifically required by the Police Chief, as the Legal Traffic Authority, who will make this determination based on the Contractor's proposed operations, traffic volumes, and traffic conditions."

"All work under this item shall be paid only for the duration of the Contract as contained in the Special Conditions under 'Time for Completion/Notice to Proceed' and for any time extensions granted in writing by the Town. Payment for police officers required after the duration of the Contract and approved time extensions shall be made directly by the Town and such costs deducted from future payments due the Contractor."

303.3 Basis of Payment: Replace Section 9.70.05 with the following:

"There will be no direct payment for safety garments or STOP/SLOW paddles. All costs associated with furnishing safety garments and STOP/SLOW paddles shall be considered included in the general cost of the item.

1. Uniformed Flagger: Uniformed flaggers will be paid for at the contract unit price per hour for "Trafficperson (Uniformed Flagger)" as listed in the bid proposal, which price shall include all compensation, insurance benefits, and any other cost or liability incidental to the furnishing of the trafficpersons ordered."

2. Police Officers: The sum of money shown on the bid proposal as "Estimated Cost" for this work will be considered the bid price even though payment will be made as described below. The estimated cost figure is not to be altered in any manner by the bidder. Should the bidder alter the amount shown, the altered figures will be disregarded and the original price will be used to determine the total amount for the contract.

When the trafficperson consists of Town of Glastonbury Police Officers, the Contractor shall provide the invoices from such work to the Engineer and the Town will pay these invoices directly. Under these circumstances, the Contractor will be reimbursed only for the 5% markup on the actual cost of police services under this line item.

306.0 TRAFFIC CONE

306.1 General: This item shall conform to SECTION 9.77 TRAFFIC CONE of the Form 816.

308.0 CONSTRUCTION BARRICADE TYPE III

308.1 General: The Contractor shall furnish construction barricades to conform to the requirements of NCHRP Report 350 (TL-3) and to the requirements stated in Article 9.71 "Maintenance and Protection of Traffic," as shown on the plans and/or as directed by the Engineer.

308.2 Materials: Prior to using the construction barricades, the Contractor shall submit to the Engineer a copy of the Letter of Acceptance issued by the FHWA to the manufacturer documenting that the devices conform to NCHRP Report 350 (TL-3).

Alternate stripes of white and orange Type III or Type VI reflective sheeting shall be applied to the horizontal members as shown on the plans. Application of the reflective sheeting shall conform to the requirements specified by the reflective sheeting manufacturer. Only one type of sheeting shall be used on a barricade and all barricades furnished shall have the same type of reflective sheeting. Reflective sheeting shall conform to the requirements of Article M.18.09.01.

Construction barricades shall be designed and fabricated so as to prevent them from being blown over or displaced by the wind from passing vehicles. Construction barricades shall be approved by the Engineer before they are used.

308.3 Construction Methods: Ineffective barricades, as determined by the Engineer and in accordance with the ATSSA guidelines contained in "Quality Standards for Work Zone Traffic Control Devices", shall be replaced by the Contractor at no cost to the State.

Barricades that are no longer required shall be removed from the project and shall remain the property of the Contractor.

308.4 Method of Measurement: Construction Barricade Type III will be measured for payment by the number of construction barricades required and used.

308.5 Basis of Payment: "Construction Barricade Type III" required and used will be paid for at the Contract unit price per each. Each barricade will be paid for once, regardless of the number of times it is used.

310.0 CONSTRUCTION SIGNS – TYPE III REFLECTIVE SHEETING

310.1 General: The Contractor shall furnish construction signs with Type III reflective sheeting and their required portable supports or metal sign posts that conform to the requirements of NCHRP Report 350 (TL-3) and to the signing requirements stated in Article 9.71 "Maintenance and Protection of Traffic," as shown on the plans and/or as directed by the Engineer.

310.2 Materials: Prior to using the construction signs and their portable supports, the Contractor shall submit to the Engineer a copy of the Letter of Acceptance issued by the FHWA to the manufacturer documenting that the devices (both sign and portable support tested together) conform to NCHRP Report 350 (TL-3).

Portable sign supports shall be designed and fabricated so that the signs do not blow over or become displaced by the wind from passing vehicles. Portable sign supports shall be approved by the Engineer before they are used.

Mounting height of signs on portable sign supports shall be a minimum of 1 foot and a maximum of 2 feet, measured from the pavement to the bottom of the sign.

All sign faces shall be rigid and reflectorized. Reflective sheeting shall conform to the requirements of Article M.18.09.01 (Type III). Sheet aluminum sign blanks shall conform to the requirements of Article M.18.13. Metal sign posts shall conform to the requirements of Article M.18.14. Application of reflective sheeting, legends, symbols, and borders shall conform to the requirements specified by the reflective sheeting manufacturer. Attachments shall be provided so that the signs can be firmly attached to the portable sign supports or metal posts without causing damage to the signs.

The following types of construction signs shall not be used: mesh, non-rigid, roll-up.

The following portable sign support systems or equivalent systems that meet the above requirements may be used:

- Korman Model #SS548 flexible sign stand with composite aluminum sign substrate (APOLIC)
- Traffix "Little Buster" dual spring folding sign stand with corrugated polyethylene (0.4 in. thick) sign substrate (InteCel)

310.3 Construction Methods: Ineffective signs, as determined by the Engineer and in accordance with the ATSSA guidelines contained in "Quality Standards for Work Zone Traffic Control Devices", shall be replaced by the Contractor at no cost to the State.

Signs and their portable supports or metal posts that are no longer required shall be removed from the project and shall remain the property of the Contractor.

310.4 Method of Measurement: Construction Signs - Type III Reflective Sheeting will be measured for payment by the number of square feet of sign face. Sign supports will not be measured for payment.

310.5 Basis of Payment: "Construction Signs – Type III Reflective Sheeting" required and used on the project will be paid for at the Contract unit price per square foot. This price shall include the furnishing and maintenance of the signs, portable sign supports, metal sign posts and all hardware. Each sign and support or posts will be paid for once, regardless of the number of times it is used.

403.0 EARTH TRENCH EXCAVATION

403.01 General: The Contractor shall make excavations of normal depth in earth for trenches and structures; shall backfill such excavations to the extent necessary; shall furnish the necessary material and construct embankments and fills; and shall make miscellaneous earth excavations and do miscellaneous grading. All such work shall be done as indicated on the drawings and as herein specified.

The program of excavation, dewatering, sheeting and bracing shall be carried out in such manner as to eliminate all possibility of undermining or disturbing the foundations of existing structures or of work previously completed under this contract.

Excavation in general shall be in open trenches. Tunneling shall be done only to pass under obstructions such as pipes or duct or only as indicated on contract drawings, or in Special Provisions, or on written permission of the Engineer, and then only in accordance with those sections hereof which describe tunnel excavation, and subject to such further conditions as may have been described by drawings, Special Provisions, or as the Engineer may specify.

The Contractor shall make excavations in such manner and to such widths as will give suitable room for building the structures or laying and jointing the piping; shall furnish and place all sheeting, bracing, and supports; shall do all coffer damming, pumping and draining; and shall render the bottom of the excavations firm and dry and acceptable in all respects.

403.02 Trench Excavation: Where pipe is to be laid in gravel bedding or concrete cradle, the trench may be excavated by machinery to or to just below, the designated subgrade, provided that the material remaining at the bottom of the trench is no more than slightly disturbed.

Where pipe is to be laid directly on the trench bottom, the lower part of trenches in earth shall not be excavated to subgrade by machinery, but, just before the pipe is to be placed, the last of the material to be excavated shall be removed by means of hand tools to form a flat or shaped bottom, true to grade, so that the pipe will have a uniform and continuous bearing and support on firm and undisturbed material between joints except for limited areas where the use of pipe slings may have disturbed the bottom.

403.03 Depth of Trench: Trenches shall be excavated to such depths as will permit the pipe to be laid at the elevations, slopes or depths of cover indicated on the drawings, and at uniform slopes between indicated elevations.

403.04 Width of Trench: The methods and equipment used for excavation must be adapted to the conditions at the site and the dimensions of the required trench. The width of ground or street surfaces cut or disturbed shall, in general, be kept as small as practicable to accommodate the work and shall not be widened by scraping or loosening materials from the sides. Every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed and consolidated.

Width of pipe trenches shall be wide enough to provide sufficient space for shoring, for foundations, for drainage, for laying, jointing, inspecting, and backfilling of sides of pipe, or for building the required structures, and as near as feasible to the above described minimums, in order to reduce the load of backfill upon the top of the sewer; to provide lateral support for the fill and haunching on the sides of the pipe, and to insure that the pipe will not be pushed out of line while placing backfill.

The maximum permissible trench width to be paid by the Town varies with the diameter of the pipe (see table 403-1). Where the Contractor chooses not to use trench supports, the Contractor will still be paid as per maximum trench widths or actual trench width, whichever is the least.

403.05 Excavation for Special Foundations: Where concrete, stone or underdrain is required or ordered, excavation shall be carried down to the depth and lines required for such foundation or underdrain. If required by contract drawings or Special Provisions as part of the structure and included in the price, no additional payment for this additional excavation, as excavation, will be made. If the foundation is paid by the cubic yard or other specific item of proposal, such price for foundation shall include excavation therefore. Excavation for underdrain is included in price for underdrain.

Where the plans, Proposal or Special Provisions indicate certain foundations, they will be constructed and paid for as indicated.

Where the soil in subgrade is found to be soft, loose or freshly-filled earth, or unstable or unsuitable as a base for the proposed sewer or structure, the Engineer may, in his discretion, order it excavated to such depth and width as he may deem proper and replaced with gravel, crushed stone, concrete, plank or similar materials as he may direct.

If the excavation for foundation is made wider or deeper than required or ordered, or if excavation for concrete on sides of pipe is made wider than required or ordered, then no additional payment for the additional quantities of excavation or for additional foundation or side filling materials will be made, if being assumed that the added space was excavated for the convenience of, or by error of, the contractor.

403.06 Length of Trench and Space Occupied: Trenches must be constructed with a minimum of inconvenience and danger to the public and all other parties. To that end, the length of trench opened at any time, from point where ground is being broken to completed backfill and temporary surfacing, and also the amount of space in streets or public and private lands occupied by trench soil banks, equipment and supplies, shall not exceed the space or spaces considered reasonably necessary and expedient by the Engineer. In determining the length of open trench, the space for equipment, materials, supplies, etc. needed, the Engineer will consider the nature of the street or land where work is being done, depth and width of trench, types and methods of construction and equipment being used, inconvenience to the public or to private parties, possible dangers, limits or rights-of-way and other proper matters.

The Contractor must keep streets and premises near the work free from unnecessary obstructions, debris, etc. The Engineer may, at any time order all equipment, materials, surplus from excavations, debris, etc., lying outside reasonable limits of space, promptly removed; and should the Contractor fail to remove such materials within three days after notice to remove same, the Engineer may cause any part or all of such materials to be removed by such persons as he may employ, at the Contractor's expense, and may deduct the costs thereof from payment which may be or may become due to the contractor under this Contract. In any cases when public safety urgently demands it, the Engineer may cause such materials to be removed without prior notice.

Trenches shall be excavated with approximately vertical sides between the elevation of the center of the pipe and an elevation one foot above the top of the pipe.

403.07 Dimensions of Trenches: Trenches shall be excavated to the lines indicated on contract drawings or as described for any particular structure by any contract document. In general, room shall be allowed for installing the pipe or other structure, for making and inspecting joints in pipe, for placing and compacting fill around and on both sides of pipe, for draining and pumping as needed, for removal of unsuitable materials, and for any other purpose incidental to the fulfillment of the Contract and these specifications.

Care must be taken to excavate to correct line, grade and width at all points.

In general, sides of trenches must be not less than four inches from outside of barrel of all pipe eight inches or less in size, six inches from outside of barrel of pipe ten inches or larger in size, or as shown by contract drawings. Except as otherwise provided, excavation shall conform closely to the form and grade of the bottom of the pipe or foundation required. To accomplish this, the Engineer may require that no earth shall be excavated by machinery nearer than six inches to the finished subgrade, and the last six inches of excavation in earth shall be carefully removed by hand labor to the exact lines and grade required, immediately prior to laying pipe or underdrain or building bottom of structure.

403.08 Extent of Open Excavation: The extent of excavation open at any one time will be controlled by the conditions, but shall always be confined to the limits prescribed by the Engineer. At no time shall the extend of the open excavation go beyond two structures.

403.09 Trench Excavation in Fill: If pipe is to be laid in embankments or other recently filled material, the material shall first be placed to the top of the fill or to a height of at least one foot above the top of the pipe, whichever is the lesser. Particular care shall be taken to ensure maximum consolidation of material under the pipe location. The pipe trench shall be excavated as though in undisturbed material.

403.10 Unauthorized Excavation: If the bottom of any excavation is taken out beyond the limits indicated or prescribed, the resulting void shall be backfilled at the Contractor's expense with ¾" crushed stone if the excavation was for a pipeline not having a concrete cradle or encasement, or with Class B concrete if the excavation was for a masonry structure.

403.11 Cutting of Pavement: When the trench lies within a paved area, the trench shall be cut with an approved tool. All cuts shall be made to straight lines and shall be parallel and/or perpendicular to the center line of the trench.

403.12 Bridging Trenches: The Contractor shall, at no cost, provide suitable and safe bridges and other crossings where required for the accommodation of travel, and to provide access to private property during construction, and shall remove said structures thereafter.

403.13 Obstacles: Some obstructions, obstacles, or difficulties in the path of the work anticipated, or in the performance of the work, may have been indicated by drawings, Special Provisions, or in other contract documents. The omission of any indication or mention of any obstruction, obstacle or difficulty which a reasonable and careful contractor, bidder, or estimator might have anticipated, or any question as to adequacy of such indication as given, shall not entitle the Contractor to any extra or additional compensation for any loss or expense occasioned directly or indirectly by such obstruction, etc., not to any extension of time or waiver of any requirement of the Contract and Specifications. The Contractor shall be understood to have entered into the Contract with full knowledge that in any work involving excavation, operation in public highways or adjacent to other developments, some unforeseen obstacle, difficulties,

unforeseen soil or ground water conditions, etc., may be encountered, and that the Contractor has included in the bid and contract obligations the assumptions of the risks and cost to which such obstacles, etc. may subject the bid.

The Town will make arrangements for clearance or avoidance of permanent obstruction by pipes and structures of public utilities and of public bodies, except as otherwise indicated on drawings or contract documents, where such obstruction is found in the space to be occupied by the pipe or structure to be built under the Contract. The Town will not assume the cost of temporary removal, support, protection, etc. of pipes, poles, and other structures which do not occupy the space to be occupied by the pipe or structure to be built for the Town, where removal, support, protection, etc. of such pipes, poles or structures is desired for the convenience of, or to save expense to, or to accommodate the equipment of the Contractor.

403.14 Ends of Certain Pipes to be Sealed: If any pipe, drain, culvert, connection or similar conduit is encountered and cut off or cut through incidental to the construction of the work, and if the said drain, etc. is not to continue to function or be used, the open end or ends of such pipes shall be securely and tightly closed by an adequate cover or bulkhead as directed by the Engineer. Except as a specific price for such closings was fixed in the Proposal, the cost of such covers, bulkheads, and the setting of them shall have been included in the price of prices bid for various other portions of the work in the Proposal and no additional payment will be made therefore.

In removing existing pipes or other structures, the Contractor shall use care to avoid damage to materials, and the Engineer shall include for payment only those new materials which are necessary to replace those unavoidably damaged.

The structures to which the provisions of the preceding three paragraphs shall apply include pipes, wires, and other structures which (a) are not indicated on the drawings or otherwise provided for, (b) encroach upon or are encountered near the substantially parallel to the edge of the excavation, and (c) in the opinion of the Engineer will impede progress to such an extent that satisfactory construction cannot proceed until they have been changed in location, removed (to be later restored), or replaced.

When fences interfere with the Contractor's operations, the Contractor shall remove and (unless otherwise specified) later restore them to at least as good condition as that in which they were found immediately before the work was begun, all without additional compensation. The restoration of fences shall be done as promptly as possible and not left until the end of the construction period.

403.15 Excavation Near Existing Structures: Attention is directed to the fact that there are pipes, drains, and other utilities in certain locations. Some of these have been indicated on the drawings, but no attempt has been made to show all of the services, and the completeness or accuracy of the information given is not guaranteed.

As the excavation approaches pipes, conduits, or other underground structures, digging by machinery shall be discontinued and the excavation shall be done by means of hand tools, as directed. Such manual excavation, when incidental to normal excavation, shall be included in the work to be done under items involving normal excavation.

Where determination of the exact location of a pipe or other underground structure is necessary for doing the work properly, the Contractor may be required to excavate test pits to determine such locations. When such test pits may be properly considered as incidental to other excavation, the Contractor shall receive no additional compensation, the work being understood to be included as a part of the excavation. When the

Engineer orders test pits beyond the limits of excavation considered as part of the work, such test pits shall be paid for as specified under MEASUREMENT AND PAYMENT.

403.16 Protection of Existing Structures: All existing pipes, poles, wires, fences, curbing, property-line markers, and other structures which the Engineer decides must be preserved in place without being temporarily or permanently relocated shall be carefully supported and protected from injury by the Contractor. Should such items be injured, they shall be restored by the Contractor, without compensation therefore, to at least as good condition as that in which they were found immediately before the work was begun.

403.17 Relocation and Replacement of Existing Structures: Whenever the Contractor encounters certain existing structures as described below and is so ordered in writing, the Contractor shall do the whole or such portions of the work as he may be directed, to change the location of, remove and later restore, replace such structures, or to assist the owner thereof in so doing. For all such work, the Contractor shall be paid under such items of work as may be applicable, otherwise as Extra Work.

403.18 Payment: This item will not be paid for separately. Rather, payment for earth trench excavation and the disposal of surplus excavated material shall be included in the unit price or lump sum price of the item associated therewith.

TABLE 403-1

TRENCH WIDTHS

Maximum pay limits for trench widths are as follows:

Where the Contractor chooses not to use trench supports the Contractor will still be paid as per maximum trench widths.

Size Pipe Nominal Inside Diameter	Maximum Width of Trench
6”	2.5 Feet
8”	4.0 Feet
10”	4.0 Feet
12”	4.0 Feet
15”	4.0 Feet
18”	4.0 Feet
21”	4.3 Feet
24”	4.5 Feet
27”	4.8 Feet
30”	5.1 Feet
33”	5.4 Feet
36”	5.7 Feet
39”	5.9 Feet
42”	6.3 Feet

404.0 TRENCH DEWATERING

404.1 General: To ensure proper conditions at all time during construction, the Contractor shall provide and maintain ample means and devices (including spare units kept ready for immediate use in case of breakdown) with which to intercept and/or remove promptly and dispose properly of all water entering trenches and other excavations. Such excavations shall be kept dry until the structures, pipes, and appurtenances to be built therein have been completed to such extent that they will not be floated or otherwise damaged.

All water pumped or drained from the work shall be disposed of in a suitable manner without undue interference with other work, damage to pavements, other surfaces, or property. Suitable temporary pipes, flumes, or channels shall be provided for water that may flow along or across the site of the work.

404.2 Temporary Underdrains: Temporary Underdrains, if used, shall be laid in trenches beneath the grade of the structure. Trenches shall be of suitable dimensions to provide room for the chosen size of underdrain and its surrounding gravel. Underdrain pipe shall be acceptable PVC or ADS pipe of standard thickness. Sewer pipe of the quality known as “seconds” will be acceptable.

Underdrains, if used, shall be laid at an approved distance below the bottom of the normal excavation wrapped in Mirafi 140 or equal as outlined in Section 409.05 of these specifications, and entirely surrounded by graded gravel or crushed stone to prevent the admission of sand or other soil into the underdrains. The distance between the top of the bell of the underdrain pipe shall be at least three (3) inches unless otherwise permitted. The space between the underdrain and the pipe or structure shall be filled and crushed stone which shall be rammed, if necessary, and left with a surface suitable for laying the pipe or building the structure.

404.3 Drainage Wellpoint System: If required, the Contractor shall dewater the excavations by means of an efficient drainage system which will drain the soil and prevent saturated soil from flowing into the excavation. The wellpoints shall be designed especially for this type of service. The pumping unit shall be designed for use with the wellpoints and shall be capable of maintaining a high vacuum and of handling large volumes of air and water at the same time.

If required, the installation of the wellpoints and pump shall be done under the supervision of a competent representative of the manufacturer. The Contractor shall do all special work such as surrounding the wellpoints with sand or gravel or other work which is necessary for the wellpoint system to operate for the successful dewatering of the excavations.

404.4 Payment: This item will not be paid for separately. Rather, payment for trench dewatering shall be included in the unit price of the item associated therewith.

405.0 BACKFILLING AND CONSOLIDATION

405.1 General: In general, and unless other material is indicated on the drawings or specified, material used for backfilling trenches and excavations around structures shall be suitable material which was removed in the course of making the construction excavations.

Frozen materials shall not be placed in the backfill nor shall backfill be placed upon frozen material. Previously frozen material shall be removed, or shall be otherwise treated a required before new backfill is placed.

405.2 Backfilling around Structures: The Contractor shall not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected without distortion, cracking, or other damage. As soon as practical after the structures are structurally adequate and other necessary work has been done, special leakage tests, if required, shall be made. Promptly after the completion of such tests, the backfilling shall be started and then shall proceed until its completion. The best of the excavated materials shall be used in backfilling within two feet of the structure. Unequal soil pressures shall be avoided by depositing the material evenly around the structure.

405.3 Backfilling Pipe Trenches: As soon as practicable after the pipes have been laid and the joints have acquired a suitable degree of hardness, if applicable, or the structures have been built and are structurally adequate to support the loads, including construction loads to which they will be subjected, the backfilling shall be started, and thereafter it shall proceed until its completion in accordance with pipe manufacturer recommendations.

With the exception mentioned below in this paragraph, trenches shall not be backfilled at pipe joints until after that section of the pipeline has successfully passed any specified tests required. Should the contractor wish to minimize the maintenance of lights and barricades and the obstruction of traffic, the contractor may, at his own risk, backfill the entire trench, omitting or including backfill at joints as soon as practicable after the joints have acquired a suitable degree of hardness, if applicable, and the related structures have acquired a suitable degree of strength. The contractor shall, however, be responsible for removing and later replacing such backfill at no cost should the contractor be ordered to do so in order to locate and repair or replace leaking or defective joints or pipe.

a. Materials: The nature of the materials will govern both their acceptability for backfill and the methods best suited for their placement and compaction in the backfill. The materials and methods shall both be subject to the approval and direction of the Engineer. No stone or rock fragment larger than 12 inches in greatest dimension shall be placed in the backfill nor shall large masses of backfill material be dropped into the trench in such a manner as to endanger the pipeline. If necessary, a timber grillage shall be used to break the fall of material dropped from a height of more than five feet. Pieces of bituminous pavement shall be excluded from the backfill unless their use is expressly permitted, in which case they shall be broken up as directed.

b. Ho Pac Trench Consolidation: Where the trench backfill is consolidated by the "Ho Pac" method and the depth of the trench from the road or ground surface to the top of the pipe exceeds ten feet, the trench backfill shall be placed and consolidated in two lifts of equal depth.

The approved backfill material shall be placed and compacted at a moisture content between four and eight percent (based on dry density, by weight), or with two percent of the optimum moisture content as determined by the moisture density relationship test specified in ASTM D 1557, at the option of the Engineer. Compaction shall be by a "Ho Pac" vibratory compactor or approved equal, operating at a frequency between ten and 40 Hertz, placed directly on the backfill surface, and applied with the maximum practical force applicable by the backhoe to which it is attached. Compaction effort shall be continued until no further visible settlement occurs.

c. Miscellaneous Requirements: Whatever method of compacting backfill is used, care shall be taken that stones and lumps shall not become nested and that all voids between stones shall be completely filled with fine material. Only approved quantities of stone and rock fragments shall be used in the backfill. The Contractor shall, as part of the work done under the items involving earth excavation and rock excavation as appropriate, furnish and place all other necessary backfill material.

All voids left by the removal of sheeting shall be completely backfilled with suitable materials, thoroughly compacted.

Where required, excavated material which is acceptable to the Engineer for surfacing or pavement sub base shall be placed at the top of the backfill to such depths as may be specified elsewhere or as directed. The surface shall be brought to the required grade and stones raked out and removed.

405.4 Embankments Over Pipe: Where the top of the pipe is less than three feet below the surface of the ground, additional fill shall be placed to form an embankment to cover and protect the pipe. The top of such embankment shall not be less than three feet above the top of the pipe and not less than one foot wider than the outside diameter of the pipe, with side slopes no steeper than one and one half horizontal to vertical, or of such section as may have been indicated by drawings. Such embankments shall be made of suitable dry earth, well compacted. Embankments must be maintained to the full required dimensions during the maintenance period of the Contract, and any settlement, washout, or deficiency occurring or found during that time shall be rectified and embankments brought up to the required height, width and slopes.

In general, such embankments may be made with materials excavated on the job and not used for backfill elsewhere. Should there not be sufficient surplus material for embankments, or should it be unsuitable or inconveniently located, the Contractor shall secure and provide sufficient suitable material. In any case, where the Town has provided borrow pits from which the Contractor may obtain filling material, the Contractor must conform to the conditions for excavating and moving such material as established by acts of the Town in obtaining such rights, and by indications on drawings or in other contract documents.

Openings through embankments for the passage of water and other purposes will be provided as indicated on drawings or elsewhere, or as ordered.

Grass shall be seeded or turf placed on embankments if, where, and as provided in contract documents. In general, if grassing is not required, the Contractor may, at his option, grass embankments to facilitate his maintenance. The Engineer may order grassing where not otherwise required under the general provisions for additional work if he deems proper.

Care shall be taken that sewer and appurtenances are not damaged by equipment or methods used for making and maintaining embankments.

Except as specific provisions may have been made in the Proposal for a particular contract, no payment other than prices bid for pipe will be paid for building and maintaining embankments or securing material therefore.

If, however, a price per cubic yard was established by the Proposal for filling material placed in embankments and/or in fills at side of embankment to avoid the formation of depressions there, the quantity of such filling material will be estimated and paid as the actual quantity placed, up to, but not exceeding the lines or sections required, measured after the embankment or fill has been made.

405.5 Material for Filling and Embankments: Approved selected materials available from the excavations and not required for backfill around pipes or against structures may be used for filling and building embankments, except as otherwise specified. Material needed in addition to that available from construction operations shall be obtained from approved gravel banks or other approved deposits. The Contractor shall furnish, at no cost, all borrowed material needed on the work.

All material, whether from the excavations of from borrow, shall be of such nature that after it has been placed and properly compacted it will make a dense, stable fill. It shall not contain vegetation, masses of roots, individual roots more than 18 inches long or more than one half inch in diameter, stones over six inches in diameter, or porous matter. Organic matter shall not exceed minor quantities and shall be well distributed.

405.6 Preparation of Subgrade: The Contractor shall remove loam and topsoil, loose vegetable matter, stumps, large roots, etc. from areas upon which embankments will be built or material will be placed for grading. The subgrade shall be shaped as indicated on the drawings and shall be so prepared by forking, furrowing, or plowing so that the first layer of the new material placed thereon will be well bonded to it.

405.7 Placing and Compacting Material: After the subgrade has been prepared as hereinbefore specified, the material shall be placed thereon and built up in successive layers until it has reached the required elevation.

Layers shall not exceed 12 inches in thickness before compaction. In embankments at structures, the layers shall have a slight downward slope away from the structure. In other embankments, the layers shall be slightly dished toward the center. In general, the finer and less pervious materials shall be placed against the structures or in the center, and the coarser and more pervious materials, upon the outer parts of embankments.

Each layer of material shall be compacted by the use of approved rollers or other approved means so as to secure a dense, stable and thoroughly compacted mass. At such points as cannot be reached by mobile mechanical equipment, the materials shall be thoroughly compacted by the use of suitable power driven tampers.

Previously placed or new materials shall be moistened by sprinkling, if required, to ensure proper bond and compaction. No compacting shall be done when the material is too wet, from either rain or too great an application of water, to compact it properly. At such times, the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compaction.

405.8 Compaction Test: When, in the opinion of the Engineer, such tests are necessary, the Contractor shall have compaction density tests taken by an approved independent laboratory. Ninety five percent of the maximum density determined in accordance with AA SHOT 180 Method D shall be achieved.

405.9 Payment: This item will not be paid for separately. Rather, payment for backfilling and consolidation shall be included in the unit price or lump sum price of the item associated therewith.

406.0 PIPES AND CULVERTS

406.1 General: These items shall conform to Section 6.51 CULVERTS of the Form 816, modified as follows:

Trench excavation, dewatering, and backfill for these items shall be according to Section 403.0 EARTH TRENCH EXCAVATION, Section 404.0 TRENCH DEWATERING, and Section 405.0 BACKFILLING AND CONSOLIDATION of these specifications.

PVC drain pipe shall be schedule 40, per ASTM D1784 and D1785.

406.2 Method of Measurement: There will be no direct measurement for trench excavation and there will be no measurement for payment for gravel fill, bedding material, or for the cost of connecting proposed pipes with existing drainage structures, but the cost thereof shall be included in the contract unit price per linear foot for the size and type of pipe being installed.

406.3 Basis for Payment: The work under these items will be paid for at the contract unit price per linear foot of pipe and size specified, complete in place including trench excavation, modification of existing drainage structures to accept proposed pipes, gravel fill, bedding material and all other materials, equipment, tools, and labor incidental thereto.

Pay Item:	Pay Units:
12-inch PVC Storm Drain Pipe	L.F.

407.0 CATCH BASINS, MANHOLES, AND DROP INLETS

407.1 General: These items shall conform to Section 5.07 CATCH BASINS, MANHOLES, AND DROP INLETS of the Form 816, modified as follows:

Trench excavation, dewatering, and backfill for these items shall be according to Section 403.0 EARTH TRENCH EXCAVATION, Section 404.0 TRENCH DEWATERING, and Section 405.0 BACKFILLING AND CONSOLIDATION of these specifications.

Manholes shall not be included under this item, but shall conform to Section 508.0 MANHOLES of these specifications. Reset Manhole shall conform to Section 509 RESET MANHOLE of these specifications.

407.3 Construction Methods:Construction Methods for the various drainage structures shall conform to the Section 5.07.03 of the Form 816 and the following:

Convert Catch Basin to Manhole (Weir Inlet): This work shall include removing the existing catch basin top and raising the existing structure to the proposed grade using concrete block and/or brick. A 30-inch long by 6-inch tall weir opening shall be formed on the south side of the structure (away from the road) at the elevation proposed to accommodate stormwater into this side of the structure. A concrete slab top suitable for H-20 loading and a manhole frame and cover shall be installed per Town standards.

Precast Concrete Yard Drain: Shall have interior dimensions of 2' x 2' with 12" deep sump, 3-inch thick walls, and a galvanized steel grate, as manufactured by United Concrete or approved equal. It shall be designed for H-20 loading, using 4,000 PSI concrete at 28 days, with steel reinforcement as per ASTM A185 and A615.

407.2 Method of Measurement: There will be no direct measurement for trench excavation, dewatering, or backfill in the installation of the various drainage appurtenances.

407.3 Basis of Payment: The work under these items shall be paid for at the unit contract price each for type of catch basins, yard drain, and drop inlets complete in place and shall include all materials, tools, equipment, and labor necessary to complete the excavation and installation of units in conformity with the plans, or as specified.

Pay Item:	Pay Units:
Type C Catch Basin Double Grate Type II	Each
Type C Catch Basin	Each
Convert Catch Basin to Manhole(Weir Inlet)	Each
Convert Catch Basin to Type C-L Catch Basin	Each
Precast Concrete Yard Drain 2'x2'	Each

410.0 UNDERDRAIN

410.1 General: These items shall conform to Section 7.51 UNDERDRAINS AND OUTLETS of the Form 816, modified as follows:

410.2 Construction Methods: Trench excavation, dewatering, and backfill for these items shall be according to Section 403.0 EARTH TRENCH EXCAVATION, Section 404.0 TRENCH DEWATERING, and Section 405.0 BACKFILLING AND CONSOLIDATION of these specifications.

Pay Item:	Pay Units:
4" Underdrain	L.F.

508.0 MANHOLES

508.01 General: The Contractor shall furnish all materials and shall construct all the sanitary or storm drain manholes required as part of this Contract, including the frames, covers, steps, inverts, and materials necessary for fastening the frame to the concrete manhole structure.

508.02 Description: Manholes shall conform in shape, size, dimensions, materials, and other respects to the details indicated on the drawings, or as ordered by the Engineer.

All manholes shall have concrete bases. Invert channels will be formed of brick and mortar at the base unless otherwise specified by the Engineer.

Manhole walls (barrels) shall be either of Class A concrete or pre-cast concrete sections. The top three feet of manholes (the dome) shall be built of either Class A concrete or a precast concrete section. Should the Contractor elect to build the domes of manholes in streets with Class A concrete or a precast concrete section, the top six inches of the dome shall be built of brick to permit adjustment of the frame to meet the street surface.

The inverts shall conform accurately to the size of the adjoining pipes. Side inverts shall be curved and main inverts (where direction changes) shall be laid out in smooth curves of the longest possible radius which is tangent to the centerlines of adjoining sewers.

The cast-iron frames and covers shall be the standard frame and cover as indicated on the drawings. The frames and covers shall be set by the Contractor to conform accurately to the grade of the finished pavement, existing ground surface, or as shown on the drawings.

Class A concrete shall conform to the requirements specified under CONCRETE MASONRY.

508.03 Precast Concrete Sections and Bases:

a. Precast concrete sections, if used, shall conform to the ASTM Tentative Specifications for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe Designation C76-63T, Class III, with the following exceptions and additional requirements:

b. There shall be one line of circular reinforcement having an area of at least 0.25 square inches per linear foot of barrel.

c. The barrel shall be not less than five inches thick.

d. Type II cement shall be used except as otherwise approved.

e. Manhole steps shall be as specified under “Manhole Steps”. Steps shall be cast into the section as it is made.

f. Sections shall be steam cured and shall not be shipped until at least seven days after having been cast.

g. Precast manhole bases will have precast rubber boots designed to conform to the changes in the line as specified by the plans.

h. No more than two lift holes may be cast or drilled in each section.

i. The date of manufacture and the name or trademark of the manufacturer shall be clearly marked on the inside of the barrel.

j. Acceptance of the sections will be on the basis of material tests and inspection of the completed product.

k. All precast units shall have O-ring rubber of mastic gasket joints.

l. Domes may be precast eccentric sections of similar construction. If precast concrete sections are used, the tops of the bases shall be suitable shaped by means of accurate bell-ring forms to receive the barrel sections.

508.04 Setting Precast Manhole Sections: Precast reinforced concrete manhole sections shall be set so as to be vertical and with sections and steps in true alignment. Joint surfaces of the base or previously set section shall be covered with lubricant and an O-ring installed before the new section is placed or an equivalent.

All holes in sections used for their handling shall be thoroughly plugged with non-shrink mortar. The non-shrink mortar shall be one part cement to one and one-half parts sand/mixed slightly damp to the touch (just short of "balling"); hammered into the holes until it is dense and an excess of paste appears on the surface; and then finished smooth and flush with the adjoining surfaces.

The non-shrink mortar for the above-noted use and for use in sealing of sewer pipe at manholes can be Embeco Mortar (premixed) as manufactured by Master Builders or an approved equal product.

508.05 Brick: The brick shall be sound, hard, and uniformly burned brick, regular and uniform in shape and size of compact texture and satisfactory to the Engineer.

Brick intended for use below ground level shall conform to ASTM Specifications for sewer brick, Serial Number C-32.

Rejected brick shall be immediately removed from the work and brick satisfactory to the Engineer substituted.

508.06 Mortar for Brickwork: The mortar shall be composed of Portland cement, hydrated lime, non-shrink agent, and sand in which the volume of sand shall not exceed three times the sum of the volumes of cement and lime. The proportions of cement and lime shall be as directed and may vary from 1:1/4 for dense, hard-burned brick to 1:3/4 for softer brick. In general, mortar for Grade SA Brick shall be mixed in the proportions of 1:1/2:4-1/2.

Cement shall be Type II Portland cement as specified for concrete masonry.

Hydrated lime shall be type S conforming to the ASTM Standard Specification for Hydrated Lime for Masonry Purposes, Designation C207-49. 4X Hydrate made by the New England Lime Co. will meet this specification.

The sand shall comply with the specifications for "Fine Aggregate" for concrete masonry except that all of the sand shall pass a No. 8 sieve.

508.07 Laying Brickwork: Only clean bricks shall be used in brickwork for manholes. The brick shall be moistened by suitable means as directed until they are neither so dry as to absorb water from the mortar nor so wet as to be slippery when laid.

Each brick shall be laid in a full bed and joint of mortar without requiring subsequent grouting, flushing, or filling and shall be thoroughly bonded as directed. All exposed interior brickwork shall be wiped clean once installed.
Manhole water tables are to be slightly sloped toward the invert (3/4-inch per foot).

508.08 Plastering and Curing Brick Masonry: Outside faces of brick masonry shall be plastered with mortar from ¼-inch to 3/8-inch thick. If required, the masonry shall be properly moistened prior to application of the mortar. The plaster shall be carefully spread and troweled so that all cracks are thoroughly worked out. After hardening, the plaster shall be carefully checked by being tapped for bond and soundness. Unbonded or unsound plaster shall be removed and replaced.

Brick masonry and plaster shall be protected from too rapid drying by the use of burlaps kept moist, or by other approved methods, and shall be protected from the weather and frost, all as required.

508.09 Coating: The exterior surfaces of all manholes shall be given two coats of bituminous waterproofing material. The material shall be Minwax Fibrous Brush Coat made by the Minwax Co., Inc., New York, NY: Tremco 121 Foundation Coating made by the Tremco Manufacturing Co., Cleveland, OH: Inertol No. 7 made by the Inertol Co., Inc., Newark 5, NJ: or approved equal products. The waterproofing material shall be applied by brush or spray and in accordance with the instruction of the manufacturer. Time shall be allowed between coats to permit sufficient drying so that the application of the second coat has no effect on the first coat.

508.10 Alterations of Existing Manholes or Pipe: Where called for on the plans, directed by the Engineer, or necessary for the new construction, existing manholes and pipes shall be altered as required. Alterations shall include, but not be limited to, cutting new entrances into manhole for pipe, cutting or plugging existing pipe, making necessary changes in invert or steps, adjusting frames by raising or lowering, and proper control of waste material in active lines. Payment for this item will be made at the contract unit price. Payment shall include all costs and labor incidental to altering the structure to the required end result.

508.11 Manhole Frames and Covers: The Contractor shall furnish all cast-iron manhole frames and covers conforming to the details shown on the drawings, or as herein specified. The castings shall be of good quality, strong, tough, even-grained cast iron, smooth, free from scale, lumps, blisters, sand holes, and defects of every nature which would render them unfit for the service for which they are intended.

Contact surfaces of covers and frames seats shall be machined to prevent rocking of covers.

All castings shall be thoroughly cleaned and subject to a careful hammer inspection.

Sanitary sewer manhole covers shall have the word “SEWER” embossed in three-inch letters as shown on the standard details.

Storm drainage manhole covers shall have the word “STORM” or “DRAIN” embossed in three-inch letters as shown on the standard details.

Castings shall be at least Class 25 Conforming to the ASTM Specification for gray Iron Castings, Designation A48 as amended to date.

508.12 Setting Manhole Frames and Covers: Manhole frames shall be set with the tops conforming accurately to the grade of the pavement or finished ground surface or as indicated on the drawings as directed. Frames shall be set concentric with the top of the masonry and in a full bed of mortar so that the space between the top of the manhole masonry and the bottom flange of the frame shall be completely filled and made watertight. A thick ring of mortar extending to the outer edge of the masonry shall be placed all around the bottom and over the top of the flange. The mortar shall be smoothly finished and have a slight slope to shed water away from the frame.

Manhole covers shall be left in place in the frames on completion of other work at the manholes. Manholes located off of the traveled roadway shall have their frames lagged to the manhole wall.

508.13 Stubs in Manholes: Stubs placed as specified and indicated on the drawings shall be either short pieces cut from the bell ends or shall be four feet, zero inch-length of reinforced concrete pipe with bulkheads. Stubs shall be set accurately to the required line and elevation and encased in the manhole masonry as shown on the drawings. Where booted-type manholes are used, no stub will be necessary. The boot shall be properly plugged. Any uncalled for boot shall be removed and the hole properly sealed with brick or a boot may be plugged if the Engineer so directs.

508.14 Drop Inlet to Manhole: Drops for sanitary sewer manholes shall be accomplished in conformity with the details found elsewhere within these documents and in accordance with the provisions of these specifications for the various materials and work which constitute the complete structure.

508.15 Manhole Steps: Unless otherwise indicated, manhole steps shall be installed as shown within the Town of Glastonbury details for plastic manhole steps or an approved equal product. The steps shall be thoroughly clean and dry before being built into the masonry.

508.16 Measurement: Where the bid item for manholes is broken into categories by height, the height of the manhole shall be measured by the linear foot of vertical height. The vertical height will be the difference in elevation between the top of the frame and the elevation of the invert measured along the vertical centerline of the manhole.

When drop inlets are included in the Contract, they shall also be broken down by height and will be measured per vertical linear feet. No measurement for payment will be made for excavation, backfilling, crushed stone base, sheeting, shoring and bracing ordered left in place, concrete, damp-proofing, manhole steps, manhole frames and covers, items incidental to the construction, but costs associated with these items shall be included in the contract unit price bid for each depth classification of the manhole.

508.17 Payment: Manholes will be paid for at the contract unit price for each manhole. This payment shall include all costs incidental to the construction of the manhole except for rock excavation which will be paid for at the respective contract unit price for this item.

509.0 RESET MANHOLE

509.1 General: Under this item shall be included the alteration or reconstruction of existing manholes in conformity with the lines, grades, dimensions, and details shown on the plans, or as ordered, and in accordance with the provisions of these specifications for the various materials and work which constitute the completed structure.

509.2 Construction Methods: Frames, covers and tops which are to be reset shall be removed from their present beds, the walls or sides shall be rebuilt to conform to the requirements of the new construction and the tops, frames and covers reset, or the grates or covers may be raised by extensions of suitable height approved by the Engineer.

Resetting tops, frames and covers will be measured as units. When resetting tops, frames and covers, there will be no measurement for excavation; cutting, removal and replacement of pavement; pervious material and backfill.

509.3 Payment: Reset Units will be paid for at the contract unit price each for "Reset Manhole," of the type specified, respectively, complete in place, which price shall include excavation, pervious material, backfill, cutting of pavement, removal and replacement of pavement structure, extensions, concrete masonry units, mortar, and all materials, equipment, tools and labor incidental thereto.

510.0 ADJUST GATE BOX

510.1 Description: Reference to the "District" in this item refers to "The Metropolitan District".

The Contractor shall adjust to final grade, the gate boxes and covers appurtenant to the water mains as required and furnish and install extension rings, extension stems, air valve extensions, covers, and additional top or bottom sections if necessary, as shown on the Contract Drawings or as directed by the Engineer in accordance with these specifications.

510.2 Materials: The Contractor shall furnish standard District cast iron Dwyer type gate box sections as required and extension stems if necessary.

All additional materials, including any resurfacing materials and any additional fill required, shall be furnished and placed by the Contractor. Gravel shall conform to Article M.02.01.

510.3 Construction Methods: The Contractor shall carefully excavate around the gate boxes, remove the boxes, install extension stems and air valve extensions, if necessary, reinstall the present gate box if reusable, adjust the box to final grade using extension rings if applicable, and refill the excavation. Care shall be taken to prevent material from filling the inside of the gate box.

Extension stems will be required if the gate box is raised 24-inches or more. Extension stems shall be fabricated according to the detail shown on sheet WS-25 of the District's "Developers Manual."

Any damage done to District facilities by the Contractor shall be repaired or replaced by the Contractor at his expense.

510.4 Method of Measurement: The number of adjust gate boxes, complete with extension stems, air valve extensions, gate box extension rings, covers, and additional top or bottom sections, if necessary, measured for payment shall be the actual number of each box reset.

510.5 Basis of Payment: This work will be paid for at the contract unit price listed in the bid proposal for "Adjust Gate Box" complete in place, which price shall include the cost of furnishing material, including labor and equipment to incorporate them into the work. It shall also include the clearing, trenching and disposal of excavated materials, refilling trenches, furnishing the additional material for refilling, grading, sheeting, bracing, and pumping.

520.0 ADJUST WATER SERVICE TO #256

520.1 Description: Reference to the "District" in this item refers to "The Metropolitan District".

The water service to #256 Williams Street East must be lowered to provide the required amount of cover over the service line required by the District due to proposed excavation and regrading of the snow shelf to accommodate the proposed sidewalk and retaining wall. The water service will be replaced by the District, however the Contractor is responsible for all excavation, backfill, and compaction as necessary for adjustment of the water service by the District.

Trench excavation, dewatering, and backfill for these items shall be according to Section 403.0 EARTH TRENCH EXCAVATION, Section 404.0 TRENCH DEWATERING, and Section 405.0 BACKFILLING AND CONSOLIDATION of these specifications.

520.2 Materials: Gravel for backfill around the adjusted water service shall conform to Article M.02.01. Utility warning tape shall conform to District standards.

520.3 Construction Methods: The Contractor shall carefully excavate adjacent to the existing water service as directed by the District within the limits of the proposed service replacement. These limits extend approximately from the curb line of Williams Street East to 6 feet behind the proposed retaining wall, or as directed by the District. Trench shall be properly dewatered, shored, and braced as directed by District personnel.

Upon completion of the excavation to the required depth below finished grade, the Contractor shall coordinate with the District for their forces to replace the water service.

Upon completion of the water service replacement work by the District, the Contractor shall install and compact approved bank gravel backfill around the water service and to a depth of 24 inches above the top of the pipe. Backfill above this area shall be additional approved gravel or other suitable excavated material approved by the District.

Utility warning tape shall be installed 24 inches above the water service at the top of the gravel backfill layer.

Restoration of the disturbed area shall be measured for payment under other items in the contract.

Any damage done to District facilities by the Contractor shall be repaired or replaced by the Contractor at his expense.

520.4 Method of Measurement: This work will not be measured since it is being paid for on a lump sum basis.

520.5 Basis of Payment: This work will be paid for at the contract lump sum price listed in the bid proposal for "Adjust Water Service to #256" complete in place, which price shall include the trench excavation, disposal of excavated materials, backfilling and consolidation, furnishing the approved gravel and other backfill materials, utility warning tape, and all sheeting, bracing, and dewatering as required.

530.0 ADJUST GAS SERVICE TO #256

530.1 Description: Reference to "CNG" in this item refers to "Connecticut Natural Gas".

The gas service to #256 Williams Street East must be lowered to provide the required amount of cover over the service line required by CNG due to proposed excavation and regrading of the snow shelf to accommodate the proposed sidewalk and retaining wall. The gas service will be replaced or relocated by CNG, however the Contractor is responsible for all excavation, backfill, and compaction as necessary for adjustment of the gas service by CNG.

Trench excavation, dewatering, and backfill for these items shall be according to the CNG Publication "Guidelines for Digging and Backfilling" included in Attachment 1, and Section 403.0 EARTH TRENCH EXCAVATION, Section 404.0 TRENCH DEWATERING, and Section 405.0 BACKFILLING AND CONSOLIDATION of these specifications.

530.2 Materials: Screened sand equivalent to "Masons Sand" shall be provided for bedding and backfill around the adjusted gas service per CNG standards. Four (4) inch wide utility warning tape shall conform to CNG standards.

530.3 Construction Methods: Construction methods shall conform to CNG specifications included in Attachment A and the following:

The Contractor shall carefully excavate adjacent to the existing gas service as directed by CNG within the limits of the proposed gas service adjustment. These limits extend approximately from the curb line of Williams Street East to 6 feet behind the proposed retaining wall, or as directed by the Engineer. Trench shall be properly dewatered, shored, and braced as directed by the Engineer. The bottom of the trench shall be free of rocks, debris, or water that could damage the pipe.

Upon completion of the excavation to the required depth below finished grade, the Contractor shall install 3" of sand bedding and coordinate with CNG for their forces to replace or relocate the gas service.

Upon completion of the gas service replacement work by CNG, the Contractor shall install and compact screened sand backfill material around the gas service to a minimum 4" on both sides and 6" above the top of the gas service pipe. The remainder of the excavation shall be backfilled and compacted with approved suitable material as directed by CNG and the Engineer.

Utility warning tape shall be installed within 12 inches of the finished grade. Restoration of the disturbed area shall be measured for payment under other items in the contract.

Any damage done to CNG facilities by the Contractor shall be repaired or replaced by the Contractor at his expense.

530.4 Method of Measurement: This work will not be measured since it is being paid for on a lump sum basis.

530.5 Basis of Payment: This work will be paid for at the contract lump sum price listed in the bid proposal for "Adjust Gas Service to #256" complete in place, which price shall include the trench excavation, disposal of excavated materials, backfilling and consolidation, furnishing the approved backfill materials, utility warning tape, and all sheeting, bracing, and dewatering as required.

600.0 PRE-FABRICATED PEDESTRIAN BRIDGE

600.1 General: These specifications are for a fully engineered clear span bridge of welded steel construction (weathering steel) and shall be regarded as minimum standards for design and construction as manufactured by Contech Bridges of 9025 Centre Pointe Drive, West Chester, OH 45069 or approved equal.

The specific style of bridge required will be a Steadfast Express Connector bridge or approved equal with the following dimensions:

Width: Inside clear width of bridge shall be 6 feet 0 inches.
Span: Total length, out to out, of the bridge superstructure shall be 60 feet 0 inches, measured horizontally.
Camber: Bridge shall be cambered to offset dead load and appear flat.
Bridge Seats: Due to longitudinal bridge slope, bridge seats shall be angled as necessary so that the seat plate is level. Vertical columns in the truss should be vertical after installation of the bridge at the slope indicated.

The bridge manufacturer shall have been in the business of design and fabrication of welded steel pedestrian bridges for a minimum of five years and shall provide a list of five successful bridge projects of similar construction, each of which has been in service at least three years as part of the bid response. List the location, bridge size, owner and contact reference for each bridge.

Design of the bridge substructure was based on the following assumed loads: Superstructure Dead Load - 6,200 LBS, Live Load (including impact) - 16,800 LBS, Total Load on One Abutment - 23,000 LBS. Support reactions for the supplied bridge shall be computed by the Bridge Manufacturer's Engineer and compared to substructure design loads stated above. If substructure support reactions for the supplied bridge exceed the design loading, then analysis and redesign of the substructure by a CT Licensed Professional Engineer shall be included in the work under this item.

600.2 Design: Open truss bridges shall be designed by a professional engineer who is experienced in pony truss bridge design and top chord stability criteria elastic utilizing lateral restraints.

Complete design calculations and drawings signed and sealed by a professional engineer licensed in the State of Connecticut shall be submitted to the owner for approval prior to fabrication.

In addition to normal dead loads, the bridge shall be designed for the following:

UNIFORM LIVE LOAD: Pedestrian bridges shall be designed for an evenly distributed live load of 90 pounds per square foot in accordance with the AASHTO Guide Specification for the Design of Pedestrian Bridges.

VEHICLE LOAD: Bridges will also be designed to withstand a moving vehicle load which weighs 1000 pounds per foot of width (up to 10,000 pounds) of bridge. This concentrated load is in addition to a 20 pounds per square foot evenly distributed live load. The vehicle load shall be distributed such that 80% of the load is on the rear axle (per AASHTO).

WIND LOAD: All bridges shall be designed for a minimum wind load of 35 pounds per square foot (approximately 120 mph). The wind is calculated on the entire vertical surface of the bridge as if fully enclosed.

DESIGN CRITERIA: The design of the bridge shall be in accordance with the "American Institute of Steel Construction"; 13th Edition. Tubular members and their connections shall be designed per the CISC "Hollow Structural Sections Connections Manual" latest edition or the AISC Manual 13th Edition.

SEISMIC: All bridges shall be designed for seismic loads of the intensity required by local codes.

TEMPERATURE: Bridge shall be designed to accommodate a temperature differential of 120 degrees Fahrenheit. Slip pads of UHMW polyethylene shall be placed between the smooth surface of this setting plate and the smooth bearing plate of the bridge. At least 1" clearance shall be provided between the bridge and concrete abutments.

DEFLECTION: The vertical deflection of the bridge due to pedestrian live load shall not exceed 1/400 of the span length. The maximum deflection due to vehicular loads shall not exceed 1/800 of the span length. For pedestrian comfort, the load used for the deflection check be a minimum of 500 pounds per lineal foot of bridge or the uniform load used in Section 3.2, whichever is greater. The horizontal deflection due to lateral wind load shall not exceed 1/500 of the span length.

SUBSTRUCTURE: The bridge manufacturer shall provide the Contractor with support reactions, anchor bolt locations and placement. The Contractor shall compare the support reactions provided by the bridge manufacturer to the Design Reactions shown on the contract plans for the abutments. The Contractor shall be responsible make any modifications to the design of the substructure if the loadings differ. The Contractor shall submit the support reactions, anchor bolt locations and placements, and any necessary modifications of the abutments to the Engineer for approval prior to construction of the substructure. All modifications to the substructure shall be designed, sealed, and stamped by a Professional Engineer registered in the State of Connecticut.

600.3 Materials:

All structural members shall have a minimum thickness of material of at least 3/16".

Unpainted Weathering Steel bridge shall be fabricated from ASTM A242 or ASTM A588 steel for plates and structural shapes and ASTM A606 or ASTM A847 for tubular sections. Minimum yield (Fy) shall be greater than 50,000 psi.

Wood Decking shall be No. 1 grade Southern Yellow Pine, 3-inch nominal thickness. Wood decking shall be treated to a minimum of 0.40 pounds of preservative per cubic foot of wood. The wood deck shall be designed for an 85 psf local loading condition. Floor planks shall be attached with at least two plated fasteners where planks cross supporting members. Planks shall be designed to carry a wheel footprint load per AASHTO.

Field splices shall be bolted with High Strength ASTM A325 bolts; type 3 bolts shall be used for weathering steel bridges.

Welding materials shall be in strict accordance with the American Welding Society (AWS). Structural welding code, D1.1 Filler metal as specified in 4.1 shall be used for the

particular welding process required. Welders will be certified in accordance with AWS D1.1.

Anchor bolts shall conform to ASTM A449 with nuts and washers conforming to ASTM A563, Grade B. Anchor bolts, nuts, and washers shall be galvanized in conformance with ASTM A153. Anchor bolts shall be cast-in-place.

Elastomeric bearing pads shall be provided in the areas where the superstructure rests on concrete. Elastomeric bearing pads shall conform to the requirements of Section M.17.01 of the Form 816.

600.4 Fabrication and Quality Control:

Bridge fabricator shall be certified by the American Institute of Steel Construction to have the personnel, organization, experience, capability, and commitment to produce fabricated structural steel for Major Steel Bridge Structures with Fracture Critical and Sophisticated Paint Endorsements as set forth in the AISC Certification Program.

Workmanship, fabrication, and shop connections shall be in accordance with American Association of State Highway and Transportation Officials Specifications (AASHTO).

Welding operators shall be properly accredited experienced operators, each of whom shall submit satisfactory evidence of experience and skill in welding structural steel with the kind of welding to be used in the work, and who have demonstrated the ability to make uniform good welds meeting the size and type of weld required.

All welding shall utilize E70 or E80 series electrodes. The weld process used shall be Flux Core Arc Welding (FCAW) or Gas Metal Arch Welding (GMAW).

The connection of bridge end post to top chord should be a mitered joint with the exposed welds ground smooth. The connection of the floor beam in a pony truss system shall not be solely into the side of a tubular bottom chord without the use of additional stiffeners to prevent chord ovalization.

All structural elements used in the bridge shall be identified by heat number of the steel member used. Specific mill test reports and individual welder certificates shall be tracked and kept on file to be provided at the request of the owner or engineer.

The bridge design Professional Engineer shall inspect the bridge structure after fabrication and furnish a signed and sealed Conformance Report and Affidavit verifying that the bridge has been inspected by the Engineer and fabricated in accordance with the Engineer's design calculations and approved shop drawings. This inspection and report shall not be delegated to any other engineer or person. For weathering steel bridges, the report shall include a summary of computations of the corrosion index (per ASTM G101) for every heat number of structural steel used in the bridge to verify that the steel is of a weathering grade.

Each bridge shall be inspected by a Certified Welding Inspector that is qualified under the AWS QC-1 program. This inspection shall include as a minimum requirement the following: review of shop drawings, weld procedures, welder qualifications, and weld testing reports, visual inspection of welds and verification of overall dimensions and geometry of the bridge. A report shall be produced indicating the above items were reviewed and shall be signed and sealed by the CWI signifying compliance with AWS D1.1 codes.

600.5 Railings & Accessories:

All railings shall have a smooth inside surface with no protrusions or depressions. All ends of angles and tubes shall be closed and ground smooth.

Railings shall be suitable for bicycle use and shall be a minimum height of 54 inches above the floor deck.

Safety Rails: Continuous rails shall be located on the inside of the trusses. The safety rails shall conform to applicable standards for height, spacing, and other dimensions.

Toe Plate: A 5" steel channel shall be located 2" above the floor deck.

600.6 Finishes: All boldly exposed surfaces of weathering steel bridges shall be sand blasted in accordance with the Steel Structures Painting Council (SSPC) Surface Preparation Specification No. 7 "Brush Blast Cleaning".

600.7 Delivery and Erection: Hauling permits and freight charges are the responsibility of the Contractor. Unloading, splicing, bolting, and proper lifting equipment are the responsibility of the Contractor. The Contractor shall install the anchor bolts in accordance with the manufacturer's anchor bolt spacing dimensions and specifications.

The Contractor is hereby alerted that the hours of operation for the delivery and installation of the pre-fabricated bridge superstructure are restricted to between 9:30 AM and 3:00 PM, Monday through Friday, or as otherwise directed by the Chief of Police (Legal Traffic Authority) as required to avoid significant traffic congestion during this operation. If a road closure/detour is required for this operation, a plan depicting the proposed detour route with signing shall be submitted to the Engineer and Chief of Police a minimum of 14 calendar days prior to the intended date of delivery.

600.8 Warranty: The manufacturer shall warranty the pedestrian bridge against defects in material and workmanship for a period of fifteen years.

600.9 Measurement and Payment: The pedestrian bridge will be paid for at the contract lump sum price as listed in the bid proposal for "Pre-fabricated Pedestrian Bridge", which price shall include all materials, equipment, labor, and work necessary for and incidental to the design, construction, delivery, unloading, assembly, and placement of the bridge on concrete abutments as shown in the contract plans, including bearing pads and all railings on the superstructure.

The cost of determining support reactions of the supplied bridge, comparing these to the Design Loads given in this specification, and any analysis and design modifications to the substructure by a CT Licensed Professional Engineer shall be included in the lump sum price for "Pre-fabricated Pedestrian Bridge".

610.0 STRUCTURE EXCAVATION

610.1 General: This item applies to the construction of abutments and footings for the proposed pedestrian bridge as indicated on the contract plans for the “Bridge Foundation Plan & Details – Sidewalk Improvements, Williams Street East, Sheet 6” and to the construction of the proposed concrete retaining wall as indicated on the contract plans for the “Protective Retaining Wall – Sidewalk Improvements, Williams Street East, Sheet 7” as prepared by Lenard Engineering, Inc.

This item shall conform to Section 2.03 STRUCTURE EXCAVATION of the Form 816, with the following section(s) replaced.

610.2 Basis of Payment (Section 2.03.05): Payment for this work will be made at the Contract unit price per cubic yard for: Structure Excavation—Earth (complete) or "Structure Excavation—Rock (complete)," whichever applies, in whole or in part, which price shall include all materials, tools, and equipment; all work related to earth support, including their design, construction, dewatering, repair, removal of obstructions, and any required reconstruction; all labor necessary to complete the excavation in conformity with the requirements of the plans or as ordered by the Engineer; the preparation of foundations as described under Article 2.03.03 of the Form 816; all necessary filling, except as otherwise provided in the Contract; and the removal of all surplus or unsuitable material resulting from the excavations.

615.0 PROTECTION AND SUPPORT OF EXISTING UNDERGROUND UTILITIES

615.1 Description: Work under this item shall consist of designing, furnishing, and placing temporary supports and temporary protection shields as necessary to protect the following existing underground utilities:

1. Gas and water services on the west side of the westerly abutment
2. Electrical conduit north of the easterly abutment
3. RCP storm sewer southeast of the easterly abutment
4. Gas main adjacent to proposed double CB at sta. 4+00
5. Gas main and water main at sta. 7+25 for drain pipe crossing
6. Gas service and water service to #256 Williams Street East

These utilities are shown on the plans as located via the test pits shown and as marked in the field by CBYD. The Contractor is herein made aware that construction of the proposed foundations, retaining wall, drainage structures, and drain pipes will require excavations that may expose these adjacent active utility lines. The work shall be performed in accordance with these specifications.

Excavation and other work in the vicinity of the noted gas main and services shall be performed according to "CNG General Provisions for Contractors When Excavating Over Cast Iron Gas Mains", and Connecticut Natural Gas Corporation Department Procedure (480.01) "Protection / Replacement of Exposed Gas Facilities". A copy of these documents is included as Attachment A to the contract documents.

The work pertaining to the temporary support primarily involves the support and prevention of damages which are possible during the excavation and construction of the work performed under this contract.

The Contractor is advised that no service interruption to the gas facility resulting from Contractor operations will be allowed, except as otherwise provided for in the Special Provision "Prosecution and Progress." Extreme caution shall be exercised during all stages of construction in order to preserve the existing utilities. A Town representative shall be present at the installation of the temporary supports and protection shields.

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

The Contractor is cautioned that it is his responsibility to verify locations, conditions and field dimensions of all existing features, as actual conditions may differ from information indicated on the plans or contained elsewhere in these specifications.

615.2 Materials: The materials for this work shall conform to the requirements of the Form 816 and be of satisfactory quality for the purpose intended and shall be approved by the Engineer. The material shall be intended for use in structures and shall be sound and capable of safely carrying the loads anticipated as part of the design of the protection shield.

615.3 Construction Methods: The Contractor shall prepare working drawings and computations showing his proposed method of support and protection for the utility to be supported and protected. Preparation of working drawings and computations shall conform to the requirements of Article 1.05.02 of the Form 816. The support shall safely carry all dead loads and any imposed loadings under all possible construction conditions. The utility

protection shields shall safely carry any imposed loadings under all possible construction conditions. Said supports and protections shall be constructed in a manner that will not interfere with the proposed construction.

The design shall be submitted to the utility representatives for review and approval. Following approval, the design shall be submitted to the Engineer for final approval at least two (2) weeks prior to the beginning of construction. No work will be allowed in the vicinity of any utility until the Contractor receives approval of his support method from the utility representative and the Engineer.

The Contractor shall use every effort to protect all utilities from damage of any nature which might result from carelessness or negligence in his operations. He shall be held solely and strictly responsible for any damage resulting from such carelessness and negligence.

A periodic inspection of the temporary utility support and protection shield shall be performed by the Contractor, as directed by the Engineer.

The Contractor shall support and maintain the existing utilities until the proposed construction has been completed to a point where removal of the temporary supports will not cause damage to the protected utility.

When the temporary utility supports and protection shield are no longer required, they shall be removed from the site by the Contractor.

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

615.5 Basis for Payment: The work will be paid for at the contract lump sum price for "Protection and Support of Existing Underground Utilities" which price shall include designing and detailing all supports and protection shields, furnishing, periodic monitoring, installing, removal, disposal, coordinating work with the utility companies, and all materials, equipment, tools and labor incidental thereto.

620.0 GRANULAR FILL

620.1 General: This item shall include the furnishing, placing, and compaction of granular material as a foundation for the footings for the proposed pedestrian bridge as indicated on the contract plans for the "Bridge Foundation Plan & Details – Sidewalk Improvements, Williams Street East, Sheet 6" and to the construction of the proposed concrete retaining wall as indicated on the contract plans for the "Protective Retaining Wall – Sidewalk Improvements, Williams Street East, Sheet 7" as prepared by Lenard Engineering, Inc., or as ordered by the Engineer. Also included in this item the furnishing and placing of Geotextile over prepared subgrade and under the Granular Fill

620.2 Materials: Granular fill shall consist of 3/8" crushed stone and meet the rest of the requirements of Article M.02.01 of the Form 816. Geotextile shall be Mirafi 500X or approved equal.

620.3 Construction Methods: When granular fill is used for foundation for structures or to replace rock or unsuitable material in trenches, it shall be deposited in layers not over 6 inches in depth, with each layer thoroughly compacted before the addition of other layers.

620.4 Method of Measurement: Granular fill will be measured in place after compaction within the payment lines shown or specified by the Engineer.

620.5 Basis of Payment: This work will be paid for at the contract unit price per cubic yard for "Granular Fill," complete in place, which price shall include all materials, tools, equipment and labor incidental thereto.

624.0 PERVIOUS STRUCTURE BACKFILL

624.1 General: Pervious structure backfill shall include the furnishing, placing, and compaction of pervious material adjacent to the pedestrian bridge footings and abutments for the proposed pedestrian bridge as indicated on the contract plans for the "Bridge Foundation Plan & Details – Sidewalk Improvements, Williams Street East, Sheet 6" and to the construction of the proposed concrete retaining wall as indicated on the contract plans for the "Protective Retaining Wall – Sidewalk Improvements, Williams Street East, Sheet 7" as prepared by Lenard Engineering, Inc., or as ordered by the Engineer.

624.2 Material: Pervious structure backfill shall conform to the requirements of Article M.02.05 of the Form 816.

624.3 Construction Methods: Pervious structure backfill shall be placed adjacent to the footings and abutments as called for or as shown on the plans.

Each layer of pervious structure backfill shall be spread to a thickness not exceeding 6 inches in depth after compaction and shall be thoroughly compacted as directed by the Engineer by the use of power rollers or other motorized vehicular equipment, by tamping with mechanical rammers or vibrators, or by pneumatic tampers. Any equipment not principally manufactured for compaction purposes and equipment, which is not in proper working order in all respects, shall not be used within the area described above.

Special attention shall be given to compaction in places close to walls where motorized vehicular equipment cannot reach. Within 3 feet of the back face of walls and within a greater distance at angle points of walls, each layer of pervious structure backfill shall be compacted by mechanical rammers, vibrators, or pneumatic tampers.

The dry density of each layer of pervious structure backfill formed from broken or crushed stone, broken or crushed gravel or reclaimed miscellaneous aggregate free of bituminous concrete shall have a dry density after compaction that is no less than 100 percent of the dry density for that material when tested in accordance with AASHTO T180, Method D. If a layer formed from reclaimed miscellaneous aggregate containing bituminous concrete is placed as pervious structure backfill, the wet density of this layer after compaction shall not be less than 100 percent of the wet density of that material when tested in accordance with AASHTO T180, Method D.

In this test, material retained on the ¾ inch sieve shall be replaced with material retained on the number 4 sieve, as noted as an option in the specifications for this test.

Each layer of the pervious structure backfill shall be compacted at optimum moisture content. No Subsequent layer shall be placed until the specified compaction is obtained for the pervious layer.

624.4 Method of Measurement: Payment lines for pervious structure backfill shall coincide with the limits of the compacted pervious structure backfill as actually placed and ordered by the Engineer. There shall be no direct payment for bagged stone, but the cost thereof shall be considered as included in the cost of the work for "Pervious Structure Backfill".

624.5 Basis of Payment: Pervious structure backfill will be paid for the contract unit price per cubic yard for "Pervious Structure Backfill", complete in place.

630.0 CLASS "A" CONCRETE

630.1 General: This item applies to the construction of abutments and footings for the proposed pedestrian bridge as indicated on the contract plans for the "Bridge Foundation Plan & Details – Sidewalk Improvements, Williams Street East, Sheet 6" and to the construction of the proposed concrete retaining wall as indicated on the contract plans for the "Protective Retaining Wall – Sidewalk Improvements, Williams Street East, Sheet 7" as prepared by Lenard Engineering, Inc. This item shall conform to Section 6.01 CONCRETE FOR STRUCTURES, of the Form 816, with the following sections amended or replaced:

Section 6.01.03 - 21 – Surface Finish:

Delete "Table of Finishes" shown in Subarticle 6.01.03 - 21 and add the following:

TABLE OF FINISHES				
Component	TYPE OF FINISH			
		Float	Grout Clean Down	Rubbed
ABUTMENTS	Exposed Top Surfaces			**X**
	Exposed Side and Front Surfaces to 1 Foot Below Grade			**X**

Section 6.01.03 - 21 – Surface Finish, Rubbed Finish: Add the following:

The entire surface shall be rubbed within 24 hours after removal of forms.

630.2 Basis of Payment (Section 6.03.05): Payment for this work will be made as follows:

This material will be paid for at the contract unit price per cubic yard for "Class A Concrete", complete in place, which price shall include all materials, equipment, tools, labor and work incidental thereto, including heating, all admixtures and joint sealer.

No direct payment will be made for the work of testing the concrete in structures, any testing equipment, the instruction of its use, or for the concrete in or curing of the required test cylinders as specified, or for completion dates set in the forms; but, the cost of this work shall be considered as included in the general cost of the work. The work of transporting and testing these cylinders will be done by the Town without expense to the Contractor.

There shall be no direct payment for the cost of forming keys or construction joints, but the cost thereof shall be considered as included in the cost of the concrete items.

Where steel dowels are used, this material will be paid for under the reinforcement item.

There shall be no direct payment for the work of placing anchor rods. Payment for placing the anchor rods shall be included in this item for "Class "A" Concrete".

640.0 DEFORMED STEEL BARS

640.1 General: This item applies to the construction of abutments and footings for the proposed pedestrian bridge as indicated on the contract plans for the “Bridge Foundation Plan & Details – Sidewalk Improvements, Williams Street East, Sheet 6” and to the construction of the proposed concrete retaining wall as indicated on the contract plans for the “Protective Retaining Wall – Sidewalk Improvements, Williams Street East, Sheet 7” as prepared by Lenard Engineering, Inc.

This item shall conform to Section 6.02 REINFORCING STEEL, of the Form 816, with the following section(s) replaced:

640.2 Basis of Payment (Section 6.02.05): Payment for this work will be made as follows:

This work will be paid for at the contract unit price per pound for "Deformed Steel Bars", complete in place and accepted, including shop drawings, furnishing, fabricating and placing reinforcing steel, welding splices and all materials, equipment, tools, labor and work incidental thereto.

660.0 DAMP-PROOFING

660.1 General: This item applies to the construction of abutments and footings for the proposed pedestrian bridge as indicated on the contract plans for the “Bridge Foundation Plan & Details – Sidewalk Improvements, Williams Street East, Sheet 6” and to the construction of the proposed concrete retaining wall as indicated on the contract plans for the “Protective Retaining Wall – Sidewalk Improvements, Williams Street East, Sheet 7” as prepared by Lenard Engineering, Inc.

This item shall conform to Section 7.08 DAMP-PROOFING of the Form 816, with the following section replaced:

660.2 Basis of Payment (Section 7.08.05): This work will be paid for at the contract unit price per square yard for "Damp-proofing," complete in place, including all material, equipment, tools, labor and incidental expense.

TOWN OF GLASTONBURY			
BID / PROPOSAL	**GL # or RPGL #**		**2016-04**
DATE ADVERTISED	**06/10/2015**	**DATE / TIME DUE**	**06/30/2015 at 11:00 A.M.**
NAME OF PROJECT	**Williams Street East Sidewalk and Pedestrian Bridge**		

It is the responsibility of the Bidder to clearly mark the outside of the bid envelope with the Bid Number, Date and Time of Bid Opening, and it also **THE RESPONSIBILITY OF THE BIDDER TO CHECK THE TOWN'S WEBSITE BEFORE SUBMITTING BID FOR ADDENDA POSTED PRIOR TO BID OPENING.**

The Bidder acknowledges receipt of the following Addenda:

Addendum #1 _____ (Initial & Date)

Addendum #2 _____ (Initial & Date)

Addendum #3 _____ (Initial & Date)

OTHER ITEMS REQUIRED WITH SUBMISSION OF BID PROPOSAL:

The following bid checklist describes items required for inclusion with the above-referenced bid proposal package. It is provided for the convenience of the bidders and, therefore, should not be assumed to be a complete list.

_____ 1. Included Bid Bond as per Section 10 of the Information for Bidders.

_____ 2. Included Disclosure of Past and Pending Mediation, Arbitration, and Litigation cases against the Bidder or its Principals as per Section 17 of the Information for Bidders.

_____ 3. Included Qualifications Statement as per Section 21 of the Information for Bidders.

_____ 4. Checked Town web site for Addenda and acknowledged Addenda on page BP-1.

_____ 5. Acknowledged Code of Ethics on page BP-5.

_____ 6. Clearly marked envelope with Bid Number, Date, Time of opening, Bidder's Company Name and address.

BIDDER NAME:_____

LINE NO.	ITEM DESCRIPTION	UNIT	QTY	UNIT PRICE	EXTENSION
1	Preparation of Site	LS	1		
2	Test Pits	EA	3		
3	Permanent Pavement Repair	SY	40		
4	Bituminous Concrete Lip Curb	LF	550		
5	Removal of Pavement	SY	300		
6	Concrete Sidewalks	SF	4,600		
7	Concrete Sidewalk Ramp	EA	1		
8	Grading & Topsoiling	SY	1,700		
9	Turf Establishment	SY	1,700		
10	Sedimentation Control System	LF	250		
11	Sediment Control Sack	EA	5		
12	Bituminous Concrete Driveway	SY	300		
13	Remove and Reset Brick Pavers	SF	20		
14	Remove and Reset Metal Beam Rail End Wrap	LS	1		
15	Modify Stone Wall	LS	1		
16	Stone Retaining Wall	SF	200		
17	Stone Masonry Veneer and Coping	SF	100		
18	Tree Protection Trench	LF	25		
19	Maintenance and Protection of Traffic	LS	1		

BIDDER NAME:_____

LINE NO.	ITEM DESCRIPTION	UNIT	QTY	UNIT PRICE	EXTENSION
20	Trafficperson (Municipal Police Officer)	EST	1	$10,000.00	$10,000.00
21	Trafficperson (Uniformed Flagger)	HR	240		
22	Traffic Cone	EA	50		
23	Construction Barricade Type III	EA	4		
24	Construction Signs - Type III Reflective Sheeting	SF	100		
25	12-inch PVC Storm Drain Pipe	LF	30		
26	Type C Catch Basin Double Grate Type II	EA	1		
27	Type C Catch Basin	EA	1		
28	Convert Catch Basin to Manhole (Weir Inlet)	EA	1		
29	Convert Catch Basin to Type C-L Catch Basin	EA	1		
30	Precast Concrete Yard Drain 2'x2'	EA	1		
31	Reset Manhole	EA	1		
32	Adjust Gate Box	EA	2		
33	Adjust Water Service to #256	LS	1		
34	Adjust Gas Service to #256	LS	1		
35	Prefabricated Pedestrian Bridge	LS	1		
36	Structure Excavation - Earth (Complete)	CY	65		
37	Structure Excavation - Rock (Complete)	CY	7		
38	Protection and Support of Existing Underground Utilities	LS	1		

BIDDER NAME:_____

LINE NO.	ITEM DESCRIPTION	UNIT	QTY	UNIT PRICE	EXTENSION
39	Granular Fill	CY	9		
40	Pervious Structure Backfill	CY	34		
41	Class "A" Concrete	CY	17		
42	Deformed Steel Bars	LB	876		
43	Damp-proofing	SY	52		
44	4" Underdrain	LF	65		

TOTAL BID AMOUNT: **$**_____

WRITTEN BID AMOUNT: _____

_____

NON-COLLUSION AFFIDAVIT:

By submission of this bid, the Bidder certifies, and in the case of a joint bid each party thereto certifies as to their own organization that this bid has been arrived at independently without consultation, communication, or agreement as to any matter relating to this bid with any other Bidder or with any competitor.

CODE OF ETHICS:

I/We have reviewed a copy of the Town of Glastonbury's Code of Ethics and agree to submit a Consultant Acknowledgement Form if I/We are selected. Yes_____ No_____**

***Bidder is advised that effective August 1, 2003, the Town of Glastonbury cannot consider any bid or proposal where the Bidder has not agreed to the above statement.**

Respectfully submitted:

Type or Print Name of Individual	**Doing Business as (Trade Name)**
Signature of Individual	**Street Address**
Title	**City, State, Zip Code**
Date	**Telephone Number/Fax Number**
E-Mail Address	**SS# or TIN#**

(Seal – If bid is by a Corporation)

Attest

ATTACHMENT A - CNG SPECIFICATIONS

GUIDELINES
FOR
DIGGING
AND
BACKFILLING

76 Meadow Street
East Hartford, CT
06108-3218
Distribution Dispatch Office
Contact Number
860-727-3206
or
Old Track Road
Greenwich, CT 06830
Contact Number
203-422-6023

Effective October 2010

CONNECTICUT NATURAL GAS CORPORATION

HARTFORD &
GREENWICH
DIVISIONS

Builder Contacts

LINE ASSIGNMENTS (MAINS)

CNG representative will provide prints of the line assignment to the builder which will be used to determine the location of the gas line.

If there is any question concerning the line assignment, the builder or his designated agent should call the Hartford Division Engineering Department (860-727-3484) or the Greenwich Division Engineering Department (203-422-6017).

SERVICE OR MAIN INSTALLATIONS

Hartford Division
Lead Analyst, Marketing & Sales (860) 727-3032
Greenwich Division
Builder Sales Representative (203) 422-6017

CNG's representative will visit your job site to determine when the main or services should be scheduled for installation. The representative will measure the length of the service and mark the meter location for all structures that are ready to accept the new lateral. It is preferred to install the service riser to the structure after it has been framed to avoid conflicts such as clearances from windows or doorways and other utilities.

The builder must notify Call-Before-You-Dig (1-800-922-4455) at least two full working days prior to excavation so that the other utility locations can be properly marked out.

Scheduling

Gas facilities should be installed only after all other utilities (sewer, water, electric and telephone) have been installed.

To finalize and confirm the date of installation, contact the Distribution office:

860-727-3280 (Hartford)
203-422-6023 (Greenwich)

If a site meeting is required, it can be arranged at this time.

Unless agreed to separately, the builder shall provide the following minimum trench lengths in advance of the CNG/sub-contractor pipe installation crew arriving to begin their work. The trench should be excavated and all rocks and debris removed. A minimum of 3" thick approved sand padding should be installed.

Steel Pipe

Pipe Size:	1-1/4-2"	4"	6"
Minimum length	350'/day	350'/day	300'/day

Plastic Pipe

Pipe Size:	1-1/4-2"	4"	6"
Minimum length	500'/day	350'/day	300'/day

Excavation Requirements

The minimum requirements for trench width are:

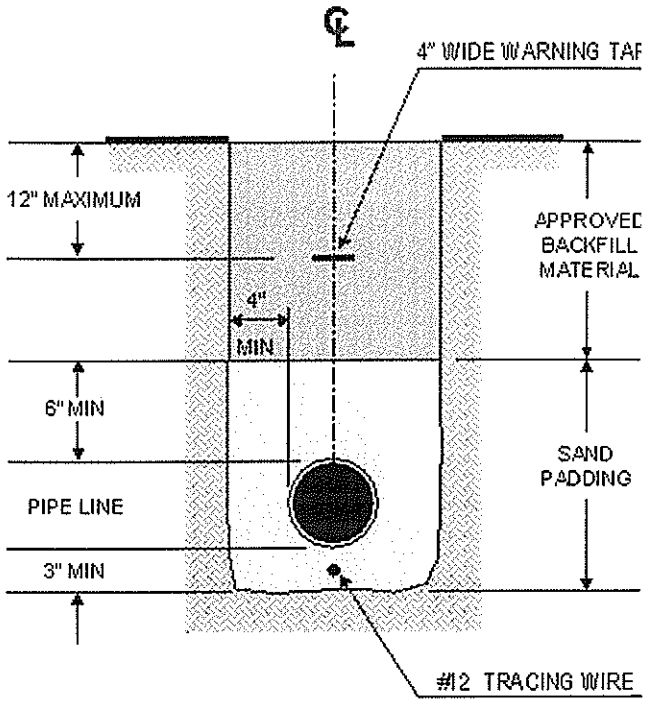
Pipe Diameter	Trench Width
1/2-4"	12"
6-8"	18"
10" & above	24"

1. A minimum of 1'0" vertical clearance and 3'0" horizontal clearance must be maintained between the gas line and all other structures.
2. Minimum cover over the pipe shall be measured as follows (also see reverse):

   In the traveled portion of the roadway
   Minimum cover shall be 30" from the top of the pipe to the top of the trench using the shallow side measurement.

   Off of the traveled portion when the section is at a lower elevation than the traveled way
   Minimum cover shall be from 24" from the top of the trench using the shallow side for measurement.

   Off of the traveled portion when the section is at a higher elevation than the traveled way
   Minimum cover shall be from 24" with the elevation taken from the gutter line.
3. Minimum cover of service lines in private property shall be 18" when outside paved areas, i.e. parking lot, or when approved by a CNG inspector or designee.
4. The bottom of the trench must be free of rocks, debris or water that could damage the pipe or its coating.
5. Prior to laying the pipe, a minimum of 3" of screened sand must be placed in the bottom of the trench. (Screened sand should be comparable to Mason sand.).
6. The first layer of pipe protection must be a minimum of 4" of sand on the sides and 6" of sand on the top.



TRENCH CROSS SECTION

7. Exposed piping must be backfilled with a minimum of 6" of sand prior to leaving the job site each day and witnessed by a CNG representative or CNG contractor.
8. The final backfilling procedure shall be witnessed and inspected by a CNG representative. Only approved select backfill material will be used.
9. The builder, upon approval of a CNG representative or its subcontractor, is to place warning tape approximately one foot below finished grade before completing trench backfill when in paved area. Warning tape shall be 6" below grade when out of paved areas.
10. The builder is required to compact the backfill material within established protocol. Trench settlement is the responsibility of the customer to correct.
11. Only personnel qualified by CNG will be allowed to install gas lines.
12. CNG will require a suitable location to store pipe and materials. Security is the responsibility of the developer.
13. The builder will be responsible for payments to CNG's subcontractor for any additional items required to complete the installation, i.e. backfill material, labor or material. In addition, the builder will also be responsible for its damage to underground facilities and for those facilities exposed. The builder will be responsible for protecting and supporting all exposed underground facilities in a manner acceptable to the subject utility.

Note: As built cover to be from top of pipe @ ℄ to finish grade.

Minimum cover for mains shall be measured as follows:

A. Off of the traveled portion when the section is at a lower elevation than the traveled way: Minimum cover shall be from 24" from the top of the trench using the shallow side for measurement.

B. In the traveled portion of the roadway: Minimum cover shall be 30" from the top of the pipe to the top of the trench using the shallow side measurement.

C. Off of the traveled portion when the section is at a higher elevation than the traveled way: Minimum cover shall be from 24" with the elevation taken from the gutter line.

Date: 3/22/07

CONNECTICUT NATURAL GAS CORPORATION

DEPARTMENTAL PROCEDURE (480.01)

PROTECTION/REPLACEMENT OF EXPOSED GAS FACILITIES

PURPOSE

This procedure establishes Corporate policy for the protection/replacement of gas facilities when exposed.

The practice of the Corporation is to adhere to the prescriptions of appropriate sections of Title 49 of the Code of Federal Regulations, Part 192.614. Any contractor, utility company crew, builder, or excavator must adhere to the regulations.

PROCEDURE

I. DEFINITIONS

A. Excavation - An operation for the purpose of movement or removal of earth, rock, or other materials in or on the ground, or otherwise disturbing the subsurface of the earth, by the use of powered or mechanized equipment. This includes, but is not limited to, digging, pile driving, augering, backfilling, test boring, drilling, grading, plowing-in, hammering, pulling-in, trenching, and tunneling.

B. Damage - Includes, but is not limited to, the weakening of structure or support, penetration or destruction of the protective coating, housing, or the severance, partial or complete, of gas facilities.

C. Gas Facility - All physical facilities which house or move gas for transportation and distribution including pipe, valves, and other appurtenances attached to the pipe.

II. NOTIFICATION

A. A copy of this procedure is given to all agencies requesting review of their proposed construction designs.

B. Upon receipt of outside agencies' plans, maps, and correspondence, Engineering Services reviews the project relative to the Corporation's facilities and responds to the requesting party.

C. The excavator notifies "Call Before You Dig" (CBYD) as prescribed by Connecticut State Law, Section 16-345 of Public Act 87-71.

D. Once excavation is started, the construction site supervisors are responsible for visiting the excavation site as outlined in Procedure #929.01 - "Monitoring of CNG Gas Facilities."

Date: 3/22/07

CONNECTICUT NATURAL GAS CORPORATION

DEPARTMENTAL PROCEDURE (480.01)

PROTECTION/REPLACEMENT OF EXPOSED GAS FACILITIES

III. GUIDELINES

A. General

1. The support for the gas facility either by strapping (see EXHIBITS I and III) or wooden vertical supports (see EXHIBIT II) is installed in a manner that the pipe does not move when the soil is removed from under the pipe and that undue stress is not imposed at fittings, valves, and other accessories on the pipe.

2. Trench shoring practices are not affected by the requirements outlined in this procedure.

3. An excavator is responsible for any damages that he/she inflicts upon the Corporation's facilities.

4. If the excavator/contractor is to be billed for damages or a replacement, the Distribution Supervisor documents, takes photographs of the affected facility, and immediately sends a letter (Exhibit IV) to the excavator/contractor stating that a bill will be forthcoming.

5. Any conflicts between CNG or the excavator/contractor regarding the billing for repair of the damage or the possible replacement are resolved by a Distribution Manager.

B. Crossings

1. Temporary Support - Cast Iron, Steel, Plastic

   EXHIBIT I is a drawing which depicts a temporary support for a gas main that crosses a trench at any angle with an exposed pipe length of greater than six feet for cast iron or ten feet for plastic or steel (see 2b).

2. Permanent Support - Cast Iron

   a. When cast iron pipe crossing exposure is six feet or less in length, one permanent pipe support is required (see EXHIBIT II).

   b. When cast iron pipe is six inches or less in diameter and crossing exceeds six feet in length, the pipe is replaced. When this condition exists, the replacement consists of the length of exposure plus a minimum of four feet measured perpendicular from the trench wall to the pipe. The removal and replacement expense is borne by the excavator/contractor.

c. When cast iron pipe is greater than six inches in diameter and is crossed and exceeds six feet in length, two or more permanent pipe supports are required.

d. When cast iron pipe is greater than six inches in diameter and is crossed and the exposure exceeds 12 feet in length, it is considered for possible replacement depending on site conditions.

3. Permanent Support - Steel, Plastic

A firm foundation of properly compacted backfill is the only permanent support required for plastic or steel pipe.

C. Parallel Excavation

1. Temporary Support - Cast Iron, Steel, Plastic

a. The EXHIBIT III drawing depicts a type of temporary support for a gas main that is exposed or undermined by a parallel excavation.

b. The policy of the Company is to replace the cast iron pipe at the excavator's/contractor's expense.

1) If the relocation is not possible at the start of the project, temporary supporting may be permitted by CNG after consideration is given to the type of pipe, length of exposed pipe, service lines, and other pertinent facts.

2) When temporary support is allowed, it should be done in a manner similar to EXHIBIT III. After the completion of the project, the replacement of a facility is scheduled to be replaced in accordance with Procedure #930.01 - "Replacement of Cast Iron Pipe."

Date: 3/22/07

CONNECTICUT NATURAL GAS CORPORATION

DEPARTMENTAL PROCEDURE (480.01)

PROTECTION/REPLACEMENT OF EXPOSED GAS FACILITIES

2. Permanent Support - Cast Iron

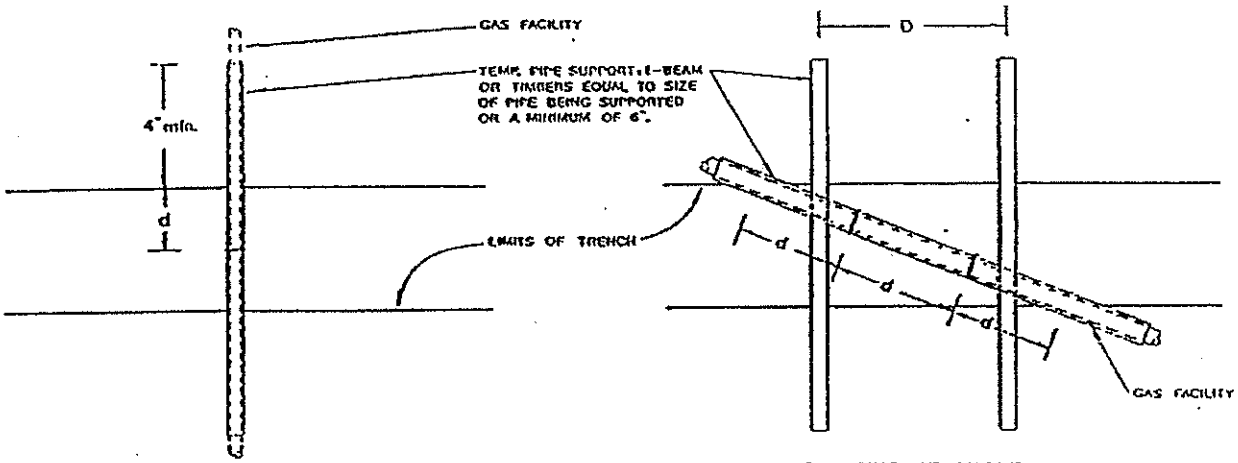
   a. After the excavation and before backfilling, if the length of exposure of a cast iron main is less than six feet, the main must be permanently supported as shown in EXHIBIT III.

   b. If the length of exposure is greater than six feet, the pipe is replaced in compliance with Departmental Procedure #930.01. The cost of this replacement will be borne by the excavator/contractor.

Approved:

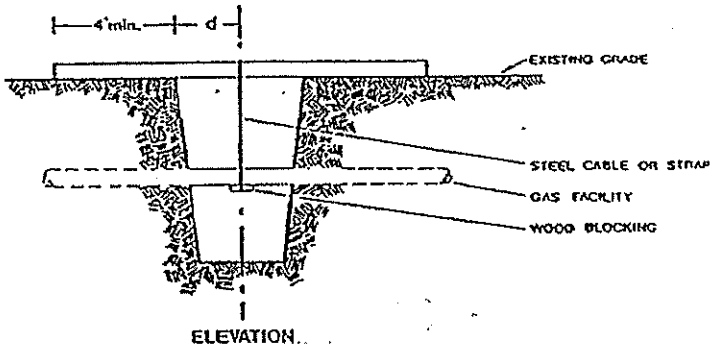
Regional Director – CNG Field Operations 3/22/07

EXHIBIT I



PERPENDICULAR CROSSING
PLAN VIEW

CROSSING AT ANGLE
PLAN VIEW



ELEVATION

D – DISTANCE BETWEEN SUPPORTING BEAMS
d – DISTANCE BETWEEN SUPPORTING STRAPS

MAXIMUM DISTANCES BETWEEN SUPPORTS – IN FEET

PIPE DIAMETER		1"	2"	4" & LARGER
CAST IRON	D	6	6	6
	d	4	4	4
STEEL / PLASTIC	D	10	15	20
	d	7	10	15

EXHIBIT I

PROTECTION of EXPOSED GAS FACILITIES 480.01

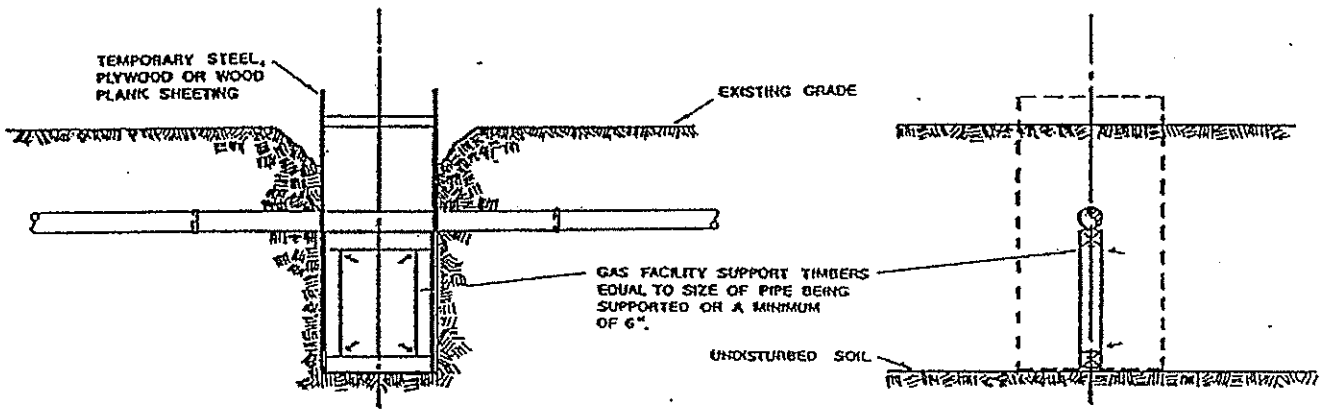
TYPICAL TEMPORARY GAS MAIN SUPPORT

CONNECTICUT NATURAL GAS CORP.

DRAWN	JW	SCALE	NONE
CHECKED		DATE	3.13.87
APPROVED		SHEET NO.	1 of 3

Refer to Procedure Memorandum #480.01

EXHIBIT II

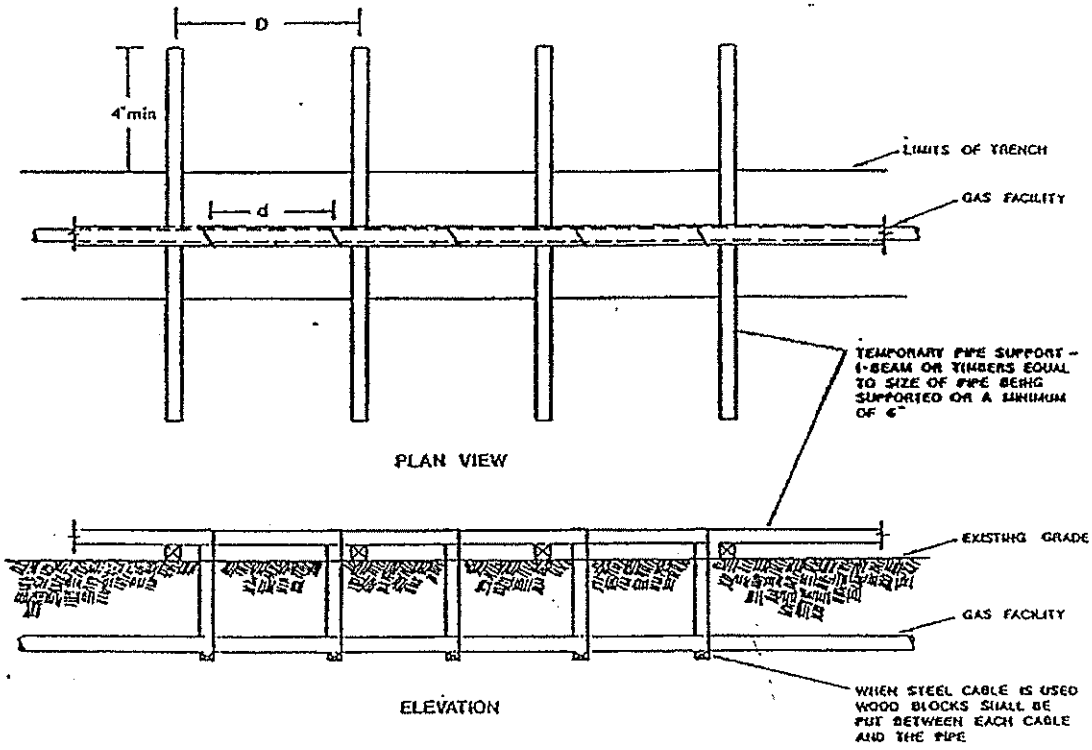


* WOOD WEDGES AS REQUIRED

EXHIBIT II			
PROTECTION of EXPOSED GAS FACILITIES 480.01			
TYPICAL PERMANENT CAST IRON GAS MAIN SUPPORT			
CONNECTICUT NATURAL GAS CORP.			
DRAWN	JW	SCALE	NONE
CHECKED		DATE	3.13.87
APPROVED		SHEET NO.	2 of 3

Refer to Procedure Memorandum #480.01

EXHIBIT III



MAXIMUM DISTANCES BETWEEN SUPPORTS - IN FEET

	PIPE DIAMETER	1"	2"	4" & LARGER
CAST IRON	D	6	6	6
	d	4	4	4
STEEL / PLASTIC	D	10	15	20
	d	7	10	15

D – DISTANCE BETWEEN SUPPORTING BEAMS
d – DISTANCE BETWEEN SUPPORTING STRAPS

EXHIBIT III
PROTECTION of EXPOSED GAS FACILITIES 480.01
TYPICAL TEMPORARY GAS MAIN SUPPORT/PARALLEL EXCAVATIONS

CONNECTICUT NATURAL GAS CORP.		
DRAWN JW	SCALE	NONE
CHECKED	DATE	3.13.87
APPROVED	SHEET NO.	3 of 3

Refer to Procedure Memorandum #480.01

Date: 3/22/07

CONNECTICUT NATURAL GAS CORPORATION

DEPARTMENTAL PROCEDURE (480.01)

PROTECTION/REPLACEMENT OF EXPOSED GAS FACILITIES

Exhibit IV

Excavator's Name
Excavator's Address
City, State, Zip

Re:

Gentlemen:

Connecticut Natural Gas Construction Site Inspector, , states that as a result of your excavating operations on , approximately feet of inch cast iron pipe was exposed and/or undermined.

It is the responsibility of the excavator to exercise reasonable care in accordance with the State of Connecticut Public Act 87-71, Section 16-345-4, Responsibility of Excavators:

> ("a") [V] (5) Exercise reasonable care when working in proximity to the under-ground facilities of any public utility. REASONABLE CARE SHALL INCLUDE, WITHOUT LIMITATION, THE USE OF CONSTRUCTION METHODS APPROPRIATE TO ENSURE THE INTEGRITY OF EXISTING UTILITY FACILITIES AND THEIR TEMPORARY AND PERMANENT SUPPORT INCLUDING BUT NOT LIMITED TO ADEQUATE AND PROPER SHORING AND PROPER BACKFILL METHODS AND TECHNIQUES; THE SELECTION OF EQUIPMENT AND EXPLOSIVES CAPABLE OF PERFORMING THE WORK WITH THE MINIMUM REASONABLE LIKELIHOOD OF DISTURBANCE TO UNDERGROUND FACILITIES; ADEQUATE SUPERVISORY PERSONNEL TO ENSURE PROPER ACTIONS; PROPER UNDERSTANDING BY THE PERSONNEL ON THE JOB SITE OF THE AUTHORITY OF ALL PARTIES INVOLVED IN THE ACTIVITY SO THAT PROMPT ACTION CAN BE TAKEN IN THE EVENT OF UNANTICIPATED CONTACT WITH UNDERGROUND FACILITIES; ADEQUATE TRAINING OF EMPLOYEES IN EXECUTING THEIR ASSIGNMENTS TO ENSURE PROTECTION OF UTILITY FACILITIES AND THE PUBLIC; MAINTAINING NECESSARY LIAISON WITH OWNERS OF UNDERGROUND FACILITIES; SPONSORING PREPLANNING AND PRECONSTRUCTION MEETINGS AS NECESSARY AND COMPLYING WITH ALL APPLICABLE LAWS AND REGULATIONS."

The cast iron pipe appears to have been undermined to an extent that jeopardizes the integrity of the facility. As a result, replacement of the facility in the immediate vicinity of excavation may be necessary. If replacement is necessary, a bill for the replacement will be submitted to you in the near future once the work is complete.

If you have any questions regarding this matter, please contact me.

Very truly yours,

Construction Site Inspector

ATTACHMENT B – PREVAILING WAGE INFORMATION

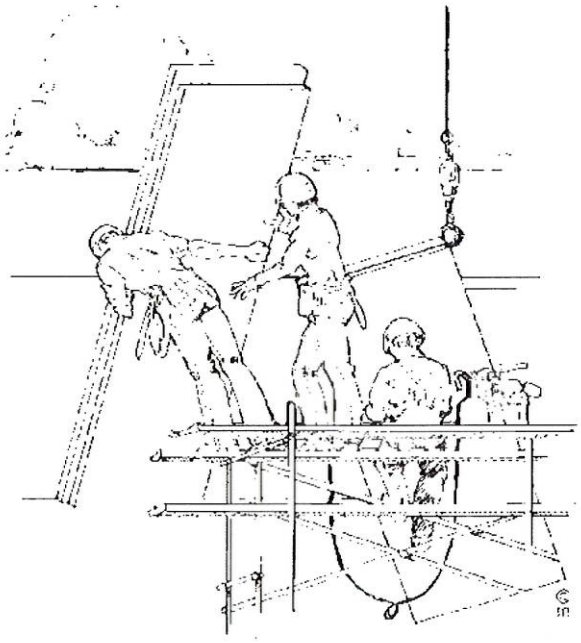
~NOTICE~

TO ALL CONTRACTING AGENCIES

Please be advised that Connecticut General Statutes Section 31-53, requires the contracting agency to certify to the Department of Labor, the total dollar amount of work to be done in connection with such public works project, regardless of whether such project consists of one or more contracts.

Please find the attached "Contracting Agency Certification Form" to be completed and returned to the Department of Labor, Wage and Workplace Standards Division, Public Contract Compliance Unit.

✎ Inquiries can be directed to (860)263-6543.



CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION
CONTRACT COMPLIANCE UNIT

CONTRACTING AGENCY CERTIFICATION FORM

I, _____, acting in my official capacity as _____,
authorized representative title

for _____, located at _____,
contracting agency address

do hereby certify that the total dollar amount of work to be done in connection with

_____, located at _____,
project name and number address

shall be $_____, which includes all work, regardless of whether such project

consists of one or more contracts.

CONTRACTOR INFORMATION

Name:_____

Address:_____
Authorized Representative:_____
Approximate Starting Date: _____

Approximate Completion Date:_____

_____ _____
Signature Date

Return To: Connecticut Department of Labor
Wage & Workplace Standards Division
Contract Compliance Unit
200 Folly Brook Blvd.
Wethersfield, CT 06109

Date Issued: _____

Statute 31-55a

Last Updated: April 22, 2010

- Special Notice -

To All State and Political Subdivisions,Their Agents, and Contractors

Connecticut General Statute 31-55a - Annual adjustments to wage rates by contractors doing state work.

Each contractor that is awarded a contract on or after October 1, 2002, for (1) the construction of a state highway or bridge that falls under the provisions of section 31-54 of the general statutes, or (2) the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project that falls under the provisions of section 31-53 of the general statutes shall contact the Labor Commissioner on or before July first of each year, for the duration of such contract, to ascertain the prevailing rate of wages on an hourly basis and the amount of payment or contributions paid or payable on behalf of each mechanic, laborer or worker employed upon the work contracted to be done, and shall make any necessary adjustments to such prevailing rate of wages and such payment or contributions paid or payable on behalf of each such employee, effective each July first.

- The prevailing wage rates applicable to any contract or subcontract awarded on or after October 1, 2002 are subject to annual adjustments each July 1st for the duration of any project which was originally advertised for bids on or after October 1, 2002.
- Each contractor affected by the above requirement shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.
- It is the ***contractor's*** responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's Web Site. The annual adjustments will be posted on the Department of Labor Web page: www.ctdol.state.ct.us. For those without internet access, please contact the division listed below.
- The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project. All subsequent annual adjustments will be posted on our Web Site for contractor access.

Any questions should be directed to the Contract Compliance Unit, Wage and Workplace Standards Division, Connecticut Department of Labor, 200 Folly Brook Blvd., Wethersfield, CT 06109 at (860)263-6790.

◂-- Workplace Laws

Published by the Connecticut Department of Labor, Project Management Office

CONNECTICUT DEPARTMENT OF LABOR
WAGE AND WORKPLACE STANDARDS DIVISION

CONTRACTORS WAGE CERTIFICATION FORM

I,_____ of _____
Officer, Owner, Authorized Rep. Company Name

do hereby certify that the _____
Company Name

_____
Street

_____
City

and all of its subcontractors will pay all workers on the

_____
Project Name and Number

_____
Street and City

the wages as listed in the schedule of prevailing rates required for such project (a copy of which is attached hereto).

_____
Signed

Subscribed and sworn to before me this _____ day of _____,_____.

_____
Notary Public

Return to:

Connecticut Department of Labor
Wage & Workplace Standards Division
200 Folly Brook Blvd.
Wethersfield, CT 06109

Rate Schedule Issued (Date): _____

Informational Bulletin

THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE

(applicable to public building contracts entered into *on or after July 1, 2007,* where the total cost of all work to be performed is at least $100,000)

(1) This requirement was created by Public Act No. 06-175, which is codified in Section 31-53b of the Connecticut General Statutes (pertaining to the prevailing wage statutes);

(2) The course is required for public building construction contracts (projects funded in whole or in part by the state or any political subdivision of the state) entered into on or after July 1, 2007;

(3) It is required of private employees (not state or municipal employees) and apprentices who perform manual labor for a general contractor or subcontractor on a public building project where the total cost of all work to be performed is at least $100,000;

(4) The ten-hour construction course pertains to the ten-hour Outreach Course conducted in accordance with federal OSHA Training Institute standards, and, for telecommunications workers, a ten-hour training course conducted in accordance with federal OSHA standard, 29 CFR 1910.268;

(5) The internet website for the federal OSHA Training Institute is http://www.osha.gov/fso/ote/training/edcenters/fact_sheet.html;

(6) The statutory language leaves it to the contractor and its employees to determine who pays for the cost of the ten-hour Outreach Course;

(7) Within 30 days of receiving a contract award, a general contractor must furnish proof to the Labor Commissioner that all employees and apprentices performing manual labor on the project will have completed such a course;

(8) Proof of completion may be demonstrated through either: (a) the presentation of a *bona fide* student course completion card issued by the federal OSHA Training Institute; *or* (2) the presentation of documentation provided to an employee by a trainer certified by the Institute pending the actual issuance of the completion card;

(9) Any card with an issuance date more than 5 years prior to the commencement date of the construction project shall not constitute proof of compliance;

(10) Each employer shall affix a copy of the construction safety course completion card to the certified payroll submitted to the contracting agency in accordance with Conn. Gen. Stat. § 31-53(f) on which such employee's name first appears;

(11) Any employee found to be in non-compliance shall be subject to removal from the worksite if such employee does not provide satisfactory proof of course completion to the Labor Commissioner by the fifteenth day after the date the employee is determined to be in noncompliance;

(12) Any such employee who is determined to be in noncompliance may continue to work on a public building construction project for a maximum of fourteen consecutive calendar days while bringing his or her status into compliance;

(13) The Labor Commissioner may make complaint to the prosecuting authorities regarding any employer or agent of the employer, or officer or agent of the corporation who files a false certified payroll with respect to the status of an employee who is performing manual labor on a public building construction project;

(14) The statute provides the minimum standards required for the completion of a safety course by manual laborers on public construction contracts; any contractor can exceed these minimum requirements; and

(15) Regulations clarifying the statute are currently in the regulatory process, and shall be posted on the CTDOL website as soon as they are adopted in final form.

(16) Any questions regarding this statute may be directed to the Wage and Workplace Standards Division of the Connecticut Labor Department via the internet website of http://www.ctdol.state.ct.us/wgwkstnd/wgemenu.htm; or by telephone at (860)263-6790.

THE ABOVE INFORMATION IS PROVIDED EXCLUSIVELY AS AN EDUCATIONAL RESOURCE, AND IS NOT INTENDED AS A SUBSTITUTE FOR LEGAL INTERPRETATIONS WHICH MAY ULTMATELY ARISE CONCERNIG THE CONSTRUCTION OF THE STATUTE OR THE REGULATIONS.

Sec. 31-53b. Construction safety and health course. New miner training program. Proof of completion required for mechanics, laborers and workers on public works projects. Enforcement. Regulations. Exceptions. (a) Each contract for a public works project entered into on or after July 1, 2009, by the state or any of its agents, or by any political subdivision of the state or any of its agents, described in subsection (g) of section 31-53, shall contain a provision requiring that each contractor furnish proof with the weekly certified payroll form for the first week each employee begins work on such project that any person performing the work of a mechanic, laborer or worker pursuant to the classifications of labor under section 31-53 on such public works project, pursuant to such contract, has completed a course of at least ten hours in duration in construction safety and health approved by the federal Occupational Safety and Health Administration or, has completed a new miner training program approved by the Federal Mine Safety and Health Administration in accordance with 30 CFR 48 or, in the case of telecommunications employees, has completed at least ten hours of training in accordance with 29 CFR 1910.268.

(b) Any person required to complete a course or program under subsection (a) of this section who has not completed the course or program shall be subject to removal from the worksite if the person does not provide documentation of having completed such course or program by the fifteenth day after the date the person is found to be in noncompliance. The Labor Commissioner or said commissioner's designee shall enforce this section.

(c) Not later than January 1, 2009, the Labor Commissioner shall adopt regulations, in accordance with the provisions of chapter 54, to implement the provisions of subsections (a) and (b) of this section. Such regulations shall require that the ten-hour construction safety and health courses required under subsection (a) of this section be conducted in accordance with federal Occupational Safety and Health Administration Training Institute standards, or in accordance with Federal Mine Safety and Health Administration Standards or in accordance with 29 CFR 1910.268, as appropriate. The Labor Commissioner shall accept as sufficient proof of compliance with the provisions of subsection (a) or (b) of this section a student course completion card issued by the federal Occupational Safety and Health Administration Training Institute, or such other proof of compliance said commissioner deems appropriate, dated no earlier than five years before the commencement date of such public works project.

(d) This section shall not apply to employees of public service companies, as defined in section 16-1, or drivers of commercial motor vehicles driving the vehicle on the public works project and delivering or picking up cargo from public works projects provided they perform no labor relating to the project other than the loading and unloading of their cargo.

(P.A. 06-175, S. 1; P.A. 08-83, S. 1.)

History: P.A. 08-83 amended Subsec. (a) by making provisions applicable to public works project contracts entered into on or after July 1, 2009, replacing provision re total cost of work with reference to Sec. 31-53(g), requiring proof in certified payroll form that new mechanic, laborer or worker has completed a 10-hour or more construction safety course and adding provision re new miner training program, amended Subsec. (b) by substituting "person" for "employee" and adding "or program", amended Subsec. (c) by adding "or in accordance with Federal Mine

Safety and Health Administration Standards" and setting new deadline of January 1, 2009, deleted former Subsec. (d) re "public building", added new Subsec. (d) re exemptions for public service company employees and delivery drivers who perform no labor other than delivery and made conforming and technical changes, effective January 1, 2009.

November 29, 2006

Notice

To All Mason Contractors and Interested Parties Regarding Construction Pursuant to Section 31-53 of the Connecticut General Statutes (Prevailing Wage)

The Connecticut Labor Department Wage and Workplace Standards Division is empowered to enforce the prevailing wage rates on projects covered by the above referenced statute.

Over the past few years the Division has withheld enforcement of the rate in effect for workers who operate a forklift on a prevailing wage rate project due to a potential jurisdictional dispute.

The rate listed in the schedules and in our Occupational Bulletin (see enclosed) has been as follows:

Forklift Operator:

- **Laborers (Group 4) Mason Tenders** - operates forklift solely to assist a mason to a maximum height of nine feet only.

- **Power Equipment Operator (Group 9)** - operates forklift to assist any trade and to assist a mason to a height over nine feet.

The U.S. Labor Department conducted a survey of rates in Connecticut but it has not been published and the rate in effect remains as outlined in the above Occupational Bulletin.

Since this is a classification matter and not one of jurisdiction, effective January 1, 2007 the Connecticut Labor Department will enforce the rate on each schedule in accordance with our statutory authority.

Your cooperation in filing appropriate and accurate certified payrolls is appreciated.

Information Bulletin
Occupational Classifications

The Connecticut Department of Labor has the responsibility to properly determine "job classification" on prevailing wage projects covered under C.G.S. Section 31-53.

Note: This information is intended to provide a sample of some occupational classifications for guidance purposes only. It is not an all-inclusive list of each occupation's duties. This list is being provided only to highlight some areas where a contractor may be unclear regarding the proper classification.

Below are additional clarifications of specific job duties performed for certain classifications:

Asbestos Insulator

- Handle, install, apply, fabricate, distribute, prepare, alter, repair, or dismantle heat and frost insulation, including penetration and fire stopping work on all penetration fire stop systems.

Carpenter

- Assembly and installation of modular fumiture/fumiture systems.
  [New] a. Free-standing furniture is not covered. This includes: student chairs, study top desks, book box desks, computer furniture, dictionary stand, atlas stand, wood shelving, two- position information access station, file cabinets, storage cabinets, tables, etc.
- Applies fire stopping materials on fire resistive joint systems only.
- Installation of insulated material of all types whether blown, nailed or attached in other ways to walls, ceilings and floors of buildings.
- Installation of curtain/window walls only where attached to wood or metal studs.

Cleaning Laborer

- The clean up of any construction debris and the general cleaning, including sweeping, wash down, mopping, wiping of the construction facility, washing, polishing, dusting, etc., prior to the issuance of a certificate of occupancy falls under the *Labor classification.*

Delivery Personnel (Revised)

- If delivery of supplies/building materials is to one common point and stockpiled there, prevailing wages are not required. If the delivery personnel are involved in the distribution of the material to multiple locations within the construction site then they would have to be paid prevailing wages for the type of work performed: laborer, equipment operator, electrician, ironworker, plumber, etc.
- An example of this would be where delivery of drywall is made to a building and the delivery personnel distribute the drywall from one "stockpile" location to further sub-locations on each floor. Distribution of material around a construction site is the job of a laborer/tradesman and not a delivery personnel.

Electrician

- Installation or maintenance of telecommunication, LAN wiring or computer equipment.
- Low voltage wiring.

Fork Lift Operator

- Laborers Group 4) Mason Tenders - operates forklift solely to assist a mason to a maximum height of nine (9) feet only.
- Power Equipment Operator Group 9 - operates forklift to assist any trade, and to assist a mason to a height over nine (9) feet.

Glaziers

- Installs light metal sash, head sills, and 2-story aluminum storefronts.
- Installation of aluminum window walls and curtain walls is the 'Soidtwork of the Glaziers and Ironworkers classification which requires either a blended rate or equal composite workforce.

Ironworkers

- Handling, sorting, and installation of reinforcing steel (rebar).
- Installation of aluminum window walls and curtain walls is the "joint work" of the Glaziers and Ironworkers classification which requires either a blended rate or equal composite workforce. Insulated metal and insulated composite panels are still installed by the Ironworker.
- Metal bridge rail (traffic), metal bridge handrail, and decorative security fence installation.

Insulator

- Installing fire stopping systems/materials for "Penetration Firestop Systems": transit to cables, electrical conduits, insulated pipes, sprinkler pipe penetrations, ductwork behind radiation, electrical cable trays, fire rated pipe penetrations, natural polypropylene, HVAC ducts, plumbing bare metal, telephone and communication wires, and boiler room ceilings. Past practice using the applicable licensed trades, Plumber, Sheet Metal, Sprinkler Fitter, and Electrician, is not inconsistent with the Insulator classification and would be permitted.

Lead Paint Removal

- Painter Rate
    1. Removal of lead paint from bridges.
    2. Removal of lead paint as preparation of any surface to be repainted.
    3. Where removal is on a Demolition project prior to reconstruction.
- Laborer Rate
    1. Removal of lead paint from any surface NOT to be repainted.
    2. Where removal is on a *TOTAL* Demolition project only.

Roofers

- Preparation of surface, tear-off and/or removal of any type of roofing, and/or clean-up of any areas where a roof is to be relaid.

Sheet Metal Worker

- Fabrication, handling, assembling, erecting, altering, repairing, etc. of coated metal material panels and composite metal material panels when used on building exteriors and interiors as soffits, facia, louvers, partitions, wall panel siding, canopies, cornice, column covers, awnings, beam covers, cladding, sun shades, lighting troughs, spires, ornamental roofing, metal ceilings, mansards, copings, ornamental and ventilation hoods, vertical and horizontal siding panels, trim, etc. The sheet metal classification also applies to the vast variety of coated metal material panels and composite metal material panels that have evolved over the years as an alternative to conventional ferrous and non-ferrous metals like steel, iron, tin, copper, brass, bronze, aluminum, etc. Insulated metal and insulated composite panels are still installed by the Iron Worker. Fabrication, handling, assembling, erecting, altering, repairing, etc. of architectural metal roof, standing seam roof, composite metal roof, metal and composite bathroom/toilet partitions, aluminum gutters, metal and composite lockers and shelving, kitchen equipment, and walk-in coolers.

Truck Drivers

- Truck Drivers delivering asphalt are covered under prevailing wage while on the site and directly involved in the paving operation.
- Material men and deliverymen are not covered under prevailing wage as long as they are not directly involved in the construction process. If, they unload the material, they would then be covered by prevailing wage for the classification they are performing work in: laborer, equipment operator, etc.
- Hauling material off site is not covered provided they are not dumping it at a location outlined above.
- Driving a truck on site and moving equipment or materials on site would be considered covered work, as hs is part of the construction process.


Any questions regarding the proper classification should be directed to the Contract Compliance Unit, Wage and Workplace Standards Division, Connecticut Department of Labor, 200 Folly Brook Blvd, Wethersfield, CT 06 109 at (860) 263-6543.

Connecticut Department of Labor
Wage and Workplace Standards Division
FOOTNOTES

⇨ Please Note: If the "Benefits" listed on the schedule for the following occupations includes a letter(s) (+ a or + a+b for instance), refer to the information below.

Benefits to be paid at the appropriate prevailing wage rate for the listed occupation.

If the "Benefits" section for the occupation lists only a dollar amount, disregard the information below.

Bricklayers, Cement Masons, Cement Finishers, Concrete Finishers, Stone Masons
(Building Construction) and
(Residential- Hartford, Middlesex, New Haven, New London and Tolland Counties)

a. Paid Holiday: Employees shall receive 4 hours for Christmas Eve holiday provided the employee works the regularly scheduled day before and after the holiday. Employers may schedule work on Christmas Eve and employees shall receive pay for actual hours worked in addition to holiday pay.

Elevator Constructors: Mechanics

a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, Christmas Day, plus the Friday after Thanksgiving.

b. Vacation: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% of basic hourly rate for 6 months to 5 years of service as vacation pay credit.

Glaziers

a. Paid Holidays: Labor Day and Christmas Day.

Power Equipment Operators
(Heavy and Highway Construction & Building Construction)

a. Paid Holidays: New Year's Day, Good Friday, Memorial day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, provided the employee works 3 days during the week in which the holiday falls, if scheduled, and if scheduled, the working day before and the working day after the holiday. Holidays falling on Saturday may be observed on Saturday, or if the employer so elects, on the preceding Friday.

Ironworkers

a. Paid Holiday: Labor Day provided employee has been on the payroll for the 5 consecutive work days prior to Labor Day.

Laborers (Tunnel Construction)

a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. No employee shall be eligible for holiday pay when he fails, without cause, to work the regular work day preceding the holiday or the regular work day following the holiday.

Roofers

a. Paid Holidays: July 4th, Labor Day, and Christmas Day provided the employee is employed 15 days prior to the holiday.

Sprinkler Fitters

a. Paid Holidays: Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day, provided the employee has been in the employment of a contractor 20 working days prior to any such paid holiday.

Truck Drivers

(Heavy and Highway Construction & Building Construction)

a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas day, and Good Friday, provided the employee has at least 31 calendar days of service and works the last scheduled day before and the first scheduled day after the holiday, unless excused.

Project: Williams Street East Sidewalks And Pedestrian Bridge

Minimum Rates and Classifications for Heavy/Highway Construction

ID#: **H** 20743

Connecticut Department of Labor
Wage and Workplace Standards Division

By virtue of the authority vested in the Labor Commissioner under provisions of Section 31-53 of the General Statutes of Connecticut, as amended, the following are declared to be the prevailing rates and welfare payments and will apply only where the contract is advertised for bid within 20 days of the date on which the rates are established. Any contractor or subcontractor not obligated by agreement to pay to the welfare and pension fund shall pay this amount to each employee as part of his/her hourly wages.

Project Number:

Project Town: Glastonbury

FAP Number:

State Number:

Project: Williams Street East Sidewalks And Pedestrian Bridge

CLASSIFICATION	Hourly Rate	Benefits
01) Asbestos/Toxic Waste Removal Laborers: Asbestos removal and encapsulation (except its removal from mechanical systems which are not to be scrapped), toxic waste removers, blasters. **See Laborers Group 5 and 7**		
1) Boilermaker	33.79	34% + 8.96
1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	32.50	28.34
2) Carpenters, Piledrivermen	31.00	22.50

As of: Thursday, June 04, 2015

Project: Williams Street East Sidewalks And Pedestrian Bridge

2a) Diver Tenders	31.00	22.50
3) Divers	39.46	22.50
4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	45.10	18.55
4a) Painters: Brush and Roller	31.02	18.55
4b) Painters: Spray Only	34.02	18.55
4c) Painters: Steel Only	33.02	18.55
4d) Painters: Blast and Spray	34.02	18.55

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4e) Painters: Tanks, Tower and Swing	33.02	18.55
5) Electrician (Trade License required: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9)	38.10	22.72 + 3% of gross wage
6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection	34.47	29.74 + a
7) Plumbers (Trade License required: (P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2) and Pipefitters (Including HVAC Work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4 G-1, G-2, G-8, G-9)	40.31	26.82
----LABORERS---- -		
8) Group 1: Laborer (Unskilled), Common or General, acetylene burner, concrete specialist	27.85	18.30
9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen	28.10	18.30

Project: Williams Street East Sidewalks And Pedestrian Bridge

10) Group 3: Pipelayers	28.35	18.30
11) Group 4: Jackhammer/Pavement breaker (handheld); mason tenders (cement/concrete), catch basin builders, asphalt rakers, air track operators, block paver, curb setter and forklift operators	28.35	18.30
12) Group 5: Toxic waste removal (non-mechanical systems)	29.85	18.30
13) Group 6: Blasters	29.60	18.30
Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)	28.85	18.30
Group 8: Traffic control signalmen	16.00	18.30
Group 9: Hydraulic Drills	28.60	18.30

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----LABORERS (TUNNEL CONSTRUCTION, FREE AIR). Shield Drive and Liner Plate Tunnels in Free Air.----		
13a) Miners, Motormen, Mucking Machine Operators, Nozzle Men, Grout Men, Shaft & Tunnel Steel & Rodmen, Shield & Erector, Arm Operator, Cable Tenders	32.22	18.30 + a
13b) Brakemen, Trackmen	31.28	18.30 + a
----CLEANING, CONCRETE AND CAULKING TUNNEL----		
14) Concrete Workers, Form Movers, and Strippers	31.28	18.30 + a
15) Form Erectors	31.60	18.30 + a
----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL IN FREE AIR:----		

16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers	31.28	18.30 + a
17) Laborers Topside, Cage Tenders, Bellman	31.17	18.30 + a
18) Miners	32.22	18.30 + a
----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR: ----		
18a) Blaster	38.53	18.30 + a
19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	38.34	18.30 + a
20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	36.41	18.30 + a

21) Mucking Machine Operator	39.11	18.30 + a
----TRUCK DRIVERS----(*see note below)		
Two axle trucks	28.58	20.24 + a
Three axle trucks; two axle ready mix	28.68	20.24 + a
Three axle ready mix	28.73	20.24 + a
Four axle trucks, heavy duty trailer (up to 40 tons)	28.78	20.24 + a
Four axle ready-mix	28.83	20.24 + a

Heavy duty trailer (40 tons and over)	29.03	20.24 + a
Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids)	28.83	20.24 + a
----POWER EQUIPMENT OPERATORS----		
Group 1: Crane handling or erecting structural steel or stone, hoisting engineer (2 drums or over), front end loader (7 cubic yards or over), Work Boat 26 ft. & Over. (Trade License Required)	37.55	23.05 + a
Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver ($3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required)	37.23	23.05 + a
Group 3: Excavator/Backhoe under 2 cubic yards; Cranes (under 100 ton rated capacity), Gradall; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar);Grader Operator; Bulldozer Fine Grade (slopes, shaping, laser or GPS, etc.). (Trade License Required)	36.49	23.05 + a
Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper)	36.10	23.05 + a

Project: Williams Street East Sidewalks And Pedestrian Bridge

Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Spreader; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24" Mandrell)	35.51	23.05 + a
Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	35.51	23.05 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	35.20	23.05 + a
Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24" and Under Mandrel).	34.86	23.05 + a
Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine.	34.46	23.05 + a
Group 9: Front End Loader (under 3 cubic yards), Skid Steer Loader regardless of attachments (Bobcat or Similar); Fork Lift, Power Chipper; Landscape Equipment (including hydroseeder).	34.03	23.05 + a
Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc.	31.99	23.05 + a

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Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment.	31.99	23.05 + a
Group 12: Wellpoint Operator.	31.93	23.05 + a
Group 13: Compressor Battery Operator.	31.35	23.05 + a
Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain).	30.21	23.05 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	29.80	23.05 + a
Group 16: Maintenance Engineer/Oiler	29.15	23.05 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	33.46	23.05 + a

Project: Williams Street East Sidewalks And Pedestrian Bridge

Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).	31.04	23.05 + a

**NOTE: SEE BELOW

----LINE CONSTRUCTION----(Railroad Construction and Maintenance)----

20) Lineman, Cable Splicer, Technician	45.43	6.25%+19.20
21) Heavy Equipment Operator	40.89	6.25%+17.18
22) Equipment Operator, Tractor Trailer Driver, Material Men	38.62	6.25%+16.68
23) Driver Groundmen	24.99	6.25%+10.87

Project: Williams Street East Sidewalks And Pedestrian Bridge

23a) Truck Driver	34.07	6.25%+15.41
----LINE CONSTRUCTION----		
24) Driver Groundmen	30.92	6.5% + 9.70
25) Groundmen	22.67	6.5% + 6.20
26) Heavy Equipment Operators	37.10	6.5% + 10.70
27) Linemen, Cable Splicers, Dynamite Men	41.22	6.5% + 12.20
28) Material Men, Tractor Trailer Drivers, Equipment Operators	35.04	6.5% + 10.45

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Welders: Rate for craft to which welding is incidental.

**Note: Hazardous waste removal work receives additional $1.25 per hour for truck drivers.*

***Note: Hazardous waste premium $3.00 per hour over classified rate*

ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra $2.00 premium in addition to the hourly wage rate and benefit contributions:

1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)

2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson

3) Cranes (under 100 ton rated capacity)

Crane with 150 ft. boom (including jib) - $1.50 extra
Crane with 200 ft. boom (including jib) - $2.50 extra
Crane with 250 ft. boom (including jib) - $5.00 extra
Crane with 300 ft. boom (including jib) - $7.00 extra
Crane with 400 ft. boom (including jib) - $10.00 extra

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyperson instructing and supervising the work of each apprentice in a specific trade.

~~Connecticut General Statute Section 31-55a: Annual Adjustments to wage rates by contractors doing state work ~~

The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.

Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.

It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.

The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol.

The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.

All subsequent annual adjustments will be posted on our Web Site for contractor access.

Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

As of: Thursday, June 04, 2015

Project: Williams Street East Sidewalks And Pedestrian Bridge

Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage

All Person who perform work ON SITE must be paid prevailing wage for the appropriate mechanic, laborer, or worker classification.

All certified payrolls must list the hours worked and wages paid to All Persons who perform work ON SITE regardless of their ownership i.e.: (Owners, Corporate Officers, LLC Members, Independent Contractors, et. al)

Reporting and payment of wages is required regardless of any contractual relationship alleged to exist between the contractor and such person.

~~Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clause (29 CFR 5.5 (a) (1) (ii)).

Please direct any questions which you may have pertaining to classification of work and payment of prevailing wages to the Wage and Workplace Standards Division, telephone (860)263-6790.

As of: Thursday, June 04, 2015

ATTACHMENT C – GEOTECHNICAL REPORT

DR. CLARENCE WELTI, P.E., P.C.

GEOTECHNICAL ENGINEERING

227 Williams Street · P.O. Box 397
Glastonbury, CT 06033-0397

(860) 633-4623 / FAX (860) 657-2514

January 23, 2015

Mr. Paul Magyar, P.E.
Lenard Engineering, Inc.
2210 Main Street, P.O. Box 1088
Glastonbury, Connecticut 06033-6088

Re: Geotechnical Study for Proposed Pedestrian Bridge over Hubbard Brook
Williams Street, Glastonbury, CT

Dear Paul:

1.0 Herewith are the boring data pertaining to the subject pedestrian bridge. Two borings were drilled to auger refusal on bedrock at a maximum depth of 30 feet below the existing grades. The borings locations are shown on the attached schematic plan. *The borings were drilled by Clarence Welti Associates, Inc. and sampling was conducted by this firm solely to obtain indications of subsurface conditions as part of a geotechnical exploration program. No services were performed by Dr. Clarence Welti, P.E., P.C. to evaluate subsurface environmental conditions.*

2.0 The **Subject Project** will include the construction of a new pedestrian bridge over Hubbard Brook. The bridge will be located approximately 15 feet off the south side of Williams Street. The bridge structure is assumed to be a prefabricated steel truss with a span length of about 60 feet. The west abutment will be about 2 feet higher then the east abutment.

3.0 The **Geologic Origin** of the natural inorganic soils at the subject site and environs are from glacial lake deposits overlying glacial moraine deposits atop the bedrock. The glacial lake deposits consist generally of silt with trace to little fine sand. The glacial moraine deposits consist generally of compact fine to medium sand, some silt, little gravel. The bedrock based on geologic mapping is Portland Arkose (arkosic sandstone).

3.1 The **Soils/Rock Cross Section** from the borings is generally as follows:

Topsoil to 5" to 6"

FILL; fine SAND, some Silt, trace Gravel and Brick to 5.5 to 8.5 feet, loose

SILT, trace to little fine Sand to 14.5 to 22.5 feet, loose to medium compact

Moraine; fine to medium SAND, some Silt, little Gravel to auger refusal on bedrock at 24 to 30 fee, medium compact to dense

3.2 The **Water Table** was evident at 7.5 feet below grade in bore hole B-2 and at 9.5 feet in borehole B-1. The water table at the crossing will generally be close to the water level in the brook. The bridge abutments will be constructed behind the existing channel retaining walls, where it is assumed that they would not be subject to scour.

3.3 Regarding the properties of the on site soils, the following are estimated values:

Existing Fills:	
Unit Weight:	120 pcf
Submerged Unit Weight	60 pcf
Angle of Internal Friction *	28°
Cohesion:	0 psf
Natural Silt and Sand Deposits:	
Unit Weight:	120 pcf
Submerged Unit Weight	60 pcf
Angle of Internal Friction *	29° to 30°
Cohesion:	0 psf
Glacial Moraine Deposits:	
Unit Weight:	130 pcf
Submerged Unit Weight	70 pcf
Angle of Internal Friction *	35+°
Cohesion:	0 psf

* Estimated from the standard penetration test data

4.0 This evaluation pertains to defining the recommended foundation types and geotechnical design parameters for the pedestrian bridge project. It is assumed that the new bridge foundations will be designed in accordance with the AASHTO Working Stress Design method. The project will be designed with U.S. Customary Units.

4.1 The **Criteria for Foundation Type and Loading** are as follows:

1. The maximum total settlement shall not exceed 1.0". the maximum differential settlement shall not exceed a relative value of 1" between the two abutments, nor ½ in a horizontal distance of 10 feet at each abutment.

2. Short span bridges and low retaining walls are usually exempt from detailed seismic analyses under the AASHTO and ConnDOT bridge design specifications.

This criteria is generally applied to bridges similar in character to the subject structure. If the owner, the architect, the engineers find the criteria as unacceptable, the writer shall be informed to permit additional geotechnical input.

4.2 Regarding **Seismic Loading,** the bridge should be exempt from a detailed seismic analysis. However, the design should address the CT DOT seismic requirements pertaining to horizontal restraint force and support length. The recommended seismic site soil profile classification is "C" based on the average standard penetration resistance of the upper 100 feet of the soil profile exceeding 50 blows/ft. The mapped MCE spectral response acceleration values for Glastonbury, CT are S_1 = **0.063** for one second period and S_S = **0.238** for short period. The ultimate friction factor for cast-in-place concrete atop the crushed stone is **0.60.**

5.0 The **Foundation Type** for the pedestrian bridge abutments and wing walls (if any) can be with spread footings. The footing sub grades shall be on the natural inorganic soils or on a controlled fill placed after the removal of any existing fills and organic soils. From the borings, the foundation sub-grades will fall a stratum of silt or silt and fine sand in close proximity to the water table. ***The natural soils will be sensitive to remolding under equipment when wet. To address this conditions it is recommended that there be a minimum 18" of*** **3/8" crushed stone atop a geotextile (Mirafi 500X, or equal)** ***as an initial layer atop the natural soils. The excavations to the foundation subgrades should be made with a smooth edged bucket to minimize disturbance to the silty soils.*** The material above the crushed stone and up to bottom foundations shall be with compacted structural (granular) fill conforming to section 6.0 below, or with crushed stone layer can be carried up to the footing bottoms. The structural fill or crushed stone shall extend beyond the footings for a horizontal distance equal to at least the depth of the fill beneath the footings.

5.1 Sheet piling may be required to permit the excavations for removal of fills and minimize disturbance to existing utilities. The 3/8" crushed stone will provide a medium for collection of water and temporary pumping during construction. If sheet piling is used, it should be assumed that they would be cut off and left in place. This is to avoid unpredictable settlements at adjacent foundations and utilities associated with pile extraction in loose silt.

5.2 The **Allowable Bearing Pressure** for footings placed on sub grades prepared as cited in section 5.0 above can be 3,000 psf.

5.3 Regarding **Lateral (static) Soil Loading,** the design of abutments and retaining walls can be based on normal active earth pressure using the active coefficient K_A = **0.28** (for level backfill). The backfill material (section 6.0) shall extend horizontally behind the walls to a distance equal to at least the height of the wall, measured from the bottom of footing to the elevation of the backfill.

5.4 The ultimate friction angle at the base of the foundations on the natural soils will be at least 30°.

This results in an ultimate sliding factor of **0.60**, based on AASHTO criteria.

5.5 The **Frost Protection Depth** for highway structures in Connecticut is 4.0 feet below finished grades.

5.6 The **Foundation Design Parameters** are summarized as follows:

Parameter	Value
Allowable Bearing Pressure	3,000 psf
Backfill Unit Weight *	125 pcf
Angle of Internal Friction*, φ	34°
Lateral At-Rest Earth pressure Coefficient*	0.45
Lateral Active Earth Pressure Coefficient *	0.28
Sliding Coefficient, concrete /soil	0.60
Mapped MCE Seismic Response Acceleration for one second Period, S_1	0.063
Mapped MCE Seismic Response Acceleration for short period, S_S	0.238
Frost Protection Depth	3.5 feet

* The cited values are based on material conforming to Section 6.0 below

6.0 The **Backfill and Structural Fill** for the abutments and retaining walls is assumed to be free draining material conforming to ConnDOT Form 816, Section M.02.05, Grading A. The compacted fill would have a unit weight equal to 125 pcf, a submerged unit weight of 66 pcf and an internal friction angle of 34°. All backfill and compacted granular fill shall be compacted to at least 95% of modified optimum density in accordance with ASTM D-1557. The 3/8" size stone shall conform to ConnDOT No. 8 crushed stone.

7.0 Regarding **Earthwork,** the excavations will be in soils classified as OSHA Type C, which will require sloping of unshored excavations exceeding 5 feet in height to slopes less than 34° from the horizontal (1.5H:1V).

8.0 This report has been prepared for specific application to the subject bridge in accordance with generally accepted soil and foundation engineering practices. This study addresses the geotechnical

requirements for the bridge foundations, only. No other warranty, express or implied, is made. In the event that any changes in the nature, design and location of structures are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

The analyzes and recommendations submitted in this report are based in part upon data obtained from referenced explorations. The extent of variations between explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

Dr. Clarence Welti, P.E., P.C., shall perform a general review of the final design and specifications in order that geotechnical design recommendations may be properly interpreted and implemented as they were intended. The existing topography, the bridge type and potential scour depths have not been determined. This report will require supplemental input to address specific areas of concern, when the information is available. Special conditions may only be apparent when the above information is available for review by the writer.

If you have any questions please call me.

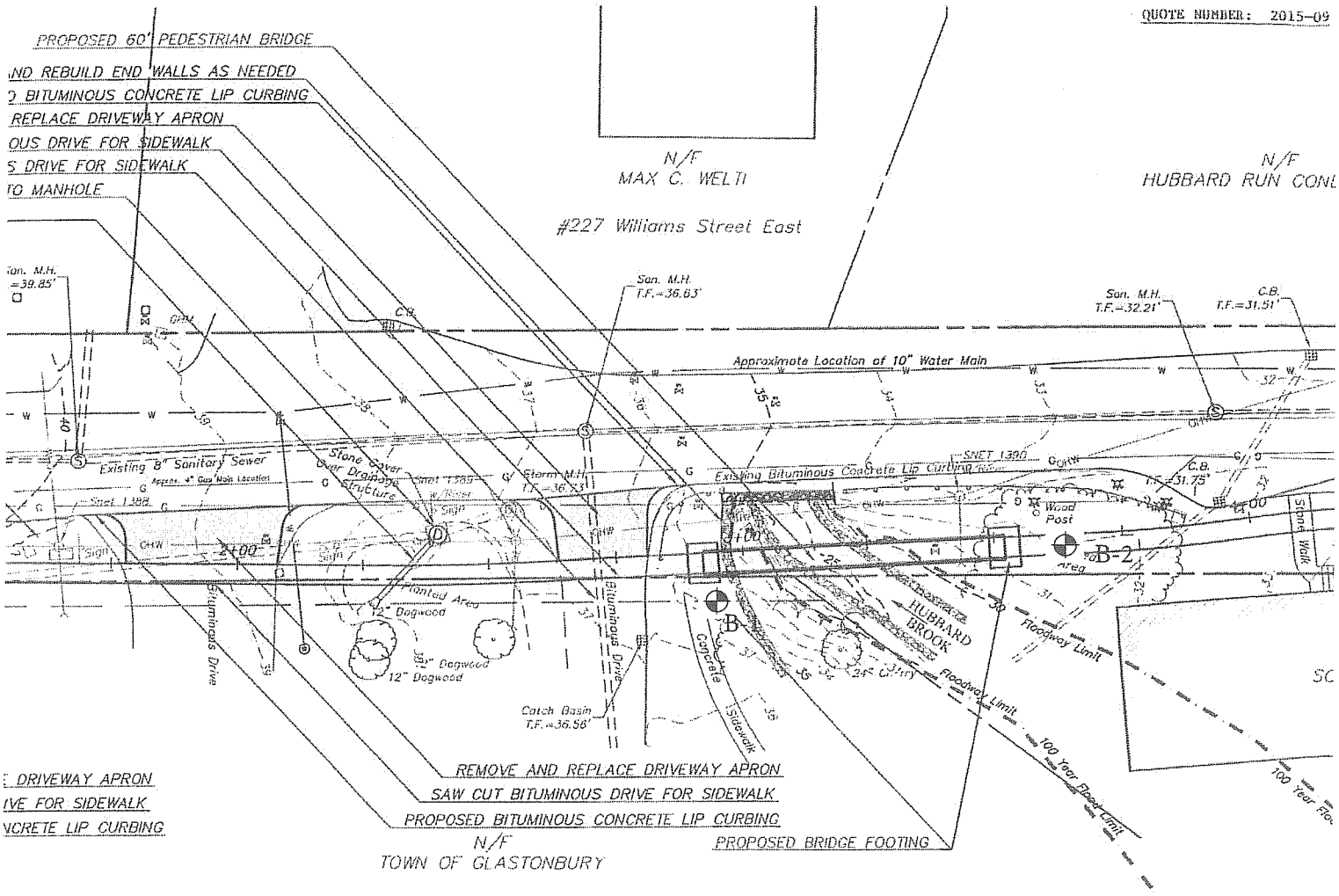
Very truly yours,

Clarence Welti Ph.D., P. E.
President, Dr. Clarence Welti P.E.; P.C.

APPENDIX

BORING LOCATION PLAN
+
BORING LOGS

QUOTE NUMBER: 2015-09



TEST BORING LOCATIONS
CLARENCE WELTI ASSOCIATES , INC.
1/16/2015

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT LENARD ENGINEERING	PROJECT NAME PROPOSED PEDESTRIAN BRIDGE OVER HUBBARD BROOK LOCATION WILLIAMS STREET, GLASTONBURY, CT.

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140 lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV. 36+/- | HOLE NO. B-1

GROUND WATER OBSERVATIONS
AT 9.5 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 1/16/15
FINISH DATE 1/16/15

DEPTH	SAMPLE NO.	BLOWS/6"	DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	22-12-5-5	0.00'-2.00'		TOPSOIL 0.4	35
					BR./DARK BR. FINE SAND, SOME SILT, TRACE FINE GRAVEL - FILL	
	2	4-3-2-1	2.00'-4.00'			
	3	1-2-3-2	4.00'-6.00'			
5						30
					8.5	
	4	1-2-3	9.00'-10.50'		BR. SILT, TRACE TO LITTLE FINE SAND	
10						25
	5	4-4-7	14.00'-15.50'			
15						20
	6	4-5-4	19.00'-20.50'			
20						15
					22.5	
					BR. FINE-MED. SAND, SOME SILT, LITTLE GRAVEL	
	7	8-12-14	24.00'-25.50'			
25						10
					29.25	
	8	60	29.00'-29.25'		WEATHERED ROCK	
30					30.0	
					AUGER REFUSAL @ 30.0'	5
35						

LEGEND: COL. A:

SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON

PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: J. BREWER
INSPECTOR:

SHEET 1 OF 1 | HOLE NO. B-1

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT LENARD ENGINEERING	PROJECT NAME PROPOSED PEDESTRIAN BRIDGE OVER HUBBARD BROOK LOCATION WILLIAMS STREET, GLASTONBURY, CT.

	AUGER	CASING	SAMPLER	CORE BAR.
TYPE	HSA		SS	
SIZE I.D.	3.75"		1.375"	
HAMMER WT.			140 lbs	
HAMMER FALL			30"	

OFFSET
LINE & STA.
N. COORDINATE
E. COORDINATE

SURFACE ELEV. 32+/-

HOLE NO. **B-2**

GROUND WATER OBSERVATIONS
AT 7.5 FT. AFTER 0 HOURS
AT FT. AFTER HOURS

START DATE 1/16/15
FINISH DATE 1/16/15

DEPTH	SAMPLE NO.	SAMPLE BLOWS/6"	SAMPLE DEPTH	A	STRATUM DESCRIPTION + REMARKS	ELEV.
0	1	1-2-2-1	0.00'-2.00'		TOPSOIL 0.5	30
					BR./DARK BR. FINE SAND, SOME SILT, TRACE BRICK - FILL	
	2	1-3-1-1	2.00'-4.00'			
	3	2-2-3-2	4.00'-6.00'			
5					5.5	25
					BR. FINE SAND AND SILT	
					8.5	
					BR. SILT, LITTLE FINE SAND	
10	4	4-5-6	10.00'-11.50'			20
					14.5	
15	5	34-12-14	15.00'-16.50'		BR. FINE-MED. SAND, SOME SILT, LITTLE GRAVEL	15
20	6	14-16-11	20.00'-21.50'			10
					24.0	
25					AUGER REFUSAL @ 24.0'	5
30						0
35						

LEGEND: COL. A:

SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON

PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%

DRILLER: J. BREWER
INSPECTOR:

SHEET 1 OF 1 | HOLE NO. **B-2**

ATTACHMENT D – WETLAND PERMIT

Town of Glastonbury

2155 MAIN STREET • P.O. BOX 6523 • GLASTONBURY, CONNECTICUT 06033-6523

March 11, 2015

Stephen Braun, Assistant Town Engineer
Town of Glastonbury
2155 Main Street
Post Office Box 6523
Glastonbury, Connecticut 06033-6523

RE: Approved Wetlands Regulated Activity along Williams Street East from Willieb Street to New London Turnpike

Dear Steve:

Pursuant to Section 12 of Glastonbury's Inland Wetlands and Watercourses Regulations you are hereby **approved to conduct your activities of constructing sidewalks and installing a pre-fabricated footbridge, portions of which are within the wetlands' upland review area associated with Hubbard Brook**, as represented by the plans submitted to our office. This approval is contingent upon **your responsibility**:

1. **to publish this approval (one time) in a newspaper** that circulates in Glastonbury within 10 days of the date of this approval letter to you;
2. **to await a 15-day appeal period** (15 days from the date of newspaper publication) before starting any work within the upland review area; and
3. **to adhere to the following conditions of approval:**
   a. Healthy mature trees shall be preserved and saved when possible. Said trees shall be protected with the use of high visibility construction fence during construction or otherwise protected as required by staff.
   b. Installation of soil erosion and sedimentation control and stabilization measures shall be the Permittee's responsibility. Once installed these measures shall then be inspected by the Environmental Planner prior to land disturbance activities. Afterwards it then shall be the Permittee's responsibility to inspect these control measures during, and immediately following, substantial storm events and maintain and/or replace the control measures, when needed, on a regular basis until the site is vegetatively stabilized. The Environmental Planner is hereby authorized to require additional soil erosion and sediment controls and stabilization measures to address situations that arise on the site.
   c. Material shall not be stockpiled in wetland areas

Failure to comply with these requirements will automatically nullify this approval and conducting your activity would constitute a wetlands violation.

Attached for your consideration and potential use is a draft public notice advertisement that needs to be published once by you in a newspaper which circulates in Glastonbury.

Please call (860) 652-7511 to advise us when the notice is to appear and in what newspaper, or if you have any questions.

Sincerely,

Tom Mocko

Thomas Mocko
Environmental Planner

WETAGTAP13.wpd
/enclosure
TM:gfm

ATTACHMENT E – CONSTRUCTION PLANS