

TOWN OF GLASTONBURY

INVITATION TO BID

<u>BID #</u>	<u>ITEM</u>	<u>DATE & TIME REQUIRED</u>
GL-2010-52	Western Boulevard Connection	July 8 th , 2010 at 11:00 A.M.

The Town of Glastonbury is currently seeking bids for the construction of approximately 1,600 linear feet of new roadway, including associated storm drainage, sanitary sewers, water main, and other related utility improvements.

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

Bid Forms may be obtained at the Office of the Purchasing Agent, Town Hall, 2155 Main Street, Glastonbury, Connecticut 06033, (second level) and via the Town's website at www.glastonbury-ct.gov.

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.

Mary F. Visone
Purchasing Agent

**WESTERN BOULEVARD CONNECTION
INVITATION TO BID**

BID #GL-2010-52

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**WESTERN BOULEVARD CONNECTION
INVITATION TO BID**

BID #GL-2010-52

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. Specifications must be submitted complete in every detail and, when requested, samples shall be provided. 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 **General Information**, then **Bids and Quotes** 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:**

The Town is required to report names of non-resident (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. **Upon award, all non-resident contractors must furnish a five percent (5%) sales tax guarantee bond (State Form AU-766) or a cash bond for five percent (5%) of the total contract price (State Form AU-72) to DRS even though this project is exempt from most sales and use taxes.**

See State Notice to Non-Resident Contractors SN 2005 (12). If the above bond is not provided, the Town is required to withhold five percent (5%) from the contractor's payments and forward it to the State DRS.

The contractor must promptly furnish to the Town a copy of the **Certificate of Compliance** issued by the State DRS.
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. Fax (860) 652-7734 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. 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 click on Bids & RFP's). 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.

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 Contractor 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 Contractor and all of its agents, employees and sub-contractors and other providers of services and shall name **both the Town and the Metropolitan District Commission, their 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 Contractors Certificate of Insurance.** Insurance shall be written with Carriers approved in the State of Connecticut and with a minimum Best's Rating of A-. 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
 - \$100,000 each accident/\$500,000 disease-policy limit/\$100,000 disease each employee
- 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 vehicles
 - Limit of Liability for Bodily Injury and Property Damage
Per Accident: \$1,000,000
- d. Umbrella Liability:
 - Limits of Liability in excess of Employer's Commercial General Liability and Automobile Liability:
Each Occurrence: \$5,000,000
Aggregate: \$5,000,000
- e. Protective Liability (Owners and Contractors Protective Liability, OCP)

For and in the name of the Town of Glastonbury and the Metropolitan District Commission with per project minimum limits of liability as follows:
Each Occurrence: \$1,000,000
Aggregate: \$2,000,000

04.02 The Bidder shall direct its Insurer to provide a Certificate of Insurance to the Town before any work is performed. The Certificate shall specify that the Town shall receive 30 days advance written notice of cancellation or non-renewal. The Certificate shall evidence all required coverage including the Additional Insured and Waiver of Subrogation. 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, the Board of Education, and the Metropolitan District, and their 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) 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, regardless of whether or not it is caused in part by a party indemnified hereunder.

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 not 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. Acceptable materials include brush, stumps, demolition materials, and excess excavated earth materials. Unacceptable materials are 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 is required to 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 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 There will be no extra payment for submitting plans or details for supporting and protecting all existing utilities during construction.

11.00 TIME FOR COMPLETION/NOTICE TO PROCEED

11.01 Within ten (10) calendar 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.

11.02 The work under this Contract shall be substantially complete by November 30th, 2010. An additional 30 days of contract time shall be provided starting April 1, 2011 to allow for final restoration of landscaped areas of the project.

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 \$100.00 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 "Proposed Western Boulevard Connector", including fifteen (15) plan sheets prepared by the Town of Glastonbury Engineering Division 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 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.

18.00 EXTRA AND COST PLUS WORK

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

19.00 COMPLIANCE WITH ENVIRONMENTAL PERMITS

19.01 A Town of Glastonbury Inland Wetland Permit was required for this project and this approval is included on the construction plans. 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, 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, 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, which price shall include the excavation and backfill of all materials, all labor, equipment and incidentals and the restoration of property including temporary pavement replacement. If 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 (1/2) 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 overlying 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.

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 shall be paid for as contained in the Bid Proposal. The work of removal of all pavement structures and pavement bases, including bituminous, concrete, 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."

Section 2.02.05 shall be removed and replaced with the following:

"Surplus Excavated Material: Any surplus topsoil that is excavated from within the project limits and not needed for restoration of disturbed areas as required by the contract shall be trucked by the contractor to the Town of Glastonbury Highway Garage located at 2380 New London Turnpike and stockpiled as directed by the Town. Other surplus excavated earth materials from the project that are not needed for formation of embankment as described by the contract shall be trucked by the contractor to the Town of Glastonbury Bulky Waste Facility location at 1145 Tryon Street and stockpiled as directed by the Town.

Any material determined by the Engineer to be unsuitable for re-use by the Town shall be disposed of in accordance with Subarticle 2.02.03-10."

106.2 Measurement & Payment: The lump sum price for "Earth Excavation" as contained in the bid proposal shall include all labor equipment, materials, transportation, fuel, disposal, etc., for excavation of earth, on site relocation of earth products and transportation of surplus earth materials to the various Town facilities as described above.

Excavation, removal, and disposal of existing bituminous or concrete pavement or sidewalk sections 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.

NOTE: All surplus earth materials shall be hauled by the contractor to the designated Town facility and shall become the property of the Town. There shall be no separate payment for transportation of surplus earth materials or disposal of unsuitable materials."

107.0 FORMATION OF SUBGRADE

107.1 General: This item shall conform to Section 2.09 SUBGRADE, of the Form 816.

108.0 SUBBASE

108.1 General: This item shall conform to Section 2.12 SUBBASE, of the Form 816, amended as follows:

108.2 Materials: The material for this item shall conform to the requirements of Article M.02.01-Granular Fill, except that reclaimed miscellaneous aggregate shall not be used.

109.0 PROCESSED STONE BASE

109.1 General: This item shall conform to Section 3.04 PROCESSED AGGREGATE BASE, of the Form 816, amended as follows:

109.2 Materials: The material for this item shall conform to the requirements of Article M.05.01, except that coarse aggregate shall be broken stone, and fine aggregate shall be stone sand, screenings, or a combination thereof.

NOTE: Basis of payment for this item shall include fine grading prior to paving. No separate payment shall be provided for such work.

112.0 BITUMINOUS CONCRETE

112.1 General: This item shall conform to Section 4.06 BITUMINOUS CONCRETE, of the Form 816, modified as follows:

112.2 Method of Measurement / Basis of Payment:
Cleaning and Sealing Joints and Cracks: The quantity of cleaned and sealed joints and cracks will be measured and paid for by the actual number of linear feet of joint that has been sealed and accepted by the Engineer.

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 1/4-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 dowels, 5/8-inch in diameter, measuring 24 inches in length shall be installed within all expansion and contraction joints, concrete driveway aprons and the last end section of each sidewalk slab poured at the end of each working day.

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 3/4-inches in diameter and 12 inches in depth into the existing concrete slab. The dowels, dipped in a liquid asphalt or grease and wrapped in aluminum foil, 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 24 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. The material for expansion joints shall be either 1/4-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 1/4-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 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.

Pedestrian Ramps shall be measured and paid for as a unit at the Contract unit price for each Pedestrian 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.

Wherever subgrade material is sand, gravel, or other previous material, and elsewhere as required by the Engineer, the Contractor shall place a four-inch layer of clay or other impervious material on the subgrade material before placing loam.

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 Topsoil", 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 roadside areas shall consist of 70% Red Fescue, 20% Kentucky Blue Grass, and 10% Perennial Blue Grass or other mix for high maintenance lawn areas as approved by the Engineer.

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.

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 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 State.

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 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" 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. The sedimentation control sack shall then be provided to the Town for re-use.

207.4 Basis of Payment: Sediment control sacks shall be paid for as a unit 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.

209.0 STONE CHECK DAMS

209.1 General: Work of this item shall generally consist of construction of stone check dams located and detailed on the contract drawings. Work shall include base preparation and excavation as necessary.

209.2 Materials: Crushed stone shall conform to section M.02.03 of the Form 816 and be 3/8" to 3/4" in size.

209.2 Measurement and Payment: The work under this item shall be paid at the contract unit price for each stone check dam constructed per contract drawings and as measured in the field. The unit price shall include all materials, equipment, labor, excavation, and tools incidental to the construction.

210.0 TEMPORARY CONSTRUCTION ENTRANCE

210.1 General: Work of this item shall generally consist of the installation and maintenance of a stone construction entrance as located and detailed on the contract drawings. Work shall include base preparation and excavation as necessary.

210.2 Materials: Stone shall consist of No. 3. stone as per section Section M01.01 of the Form 816.

210.3 Measurement and Payment: The work under this item shall be paid at the contract lump sum price for the stone construction entrance completed, and in place as per contract drawings. The unit price shall include all materials, equipment, labor, excavation, and tools incidental to the construction and maintenance of this item.

211.0 TEMPORARY WATER BAR WITH LEVEL SPREADER

211.1 General: Work of this item shall generally consist of the construction and maintenance of temporary water diversion bars with level spreader as located and detailed on the contract drawings and as directed by the Engineer. These shall be installed at the locations shown on the plans and as directed by the Engineer to control the flow of storm water across the disturbed areas of the site and prevent sedimentation and erosion.

211.2 Construction Methods: Work shall include base preparation, excavation, and compaction of existing on site earth materials as required to create the temporary water bar with level spreader as described in the contract drawings. The temporary water bar with level spreader shall be maintained in working order until the roadway subbase material has been installed throughout the project limits.

211.2 Measurement and Payment: Measurement for payment will not take place until such time as the roadway subbase has been installed and the temporary water diversion bar has served its useful life and has been removed. The work under this item shall be paid at the contract unit price for each temporary water diversion bar with level spreader completed as per contract drawings and accepted by the Engineer. The unit price shall include all materials, equipment, labor, excavation, and tools incidental to the construction and maintenance of these items.

213.0 EARTHWORK AND GRADING FOR SIDEWALK CONSTRUCTION

213.1 General: 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.

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 provided otherwise below and in the Bid Proposal for "Removal of Pavement", all of the above-described work under the heading of EARTHWORK AND GRADING FOR SIDEWALK CONSTRUCTION shall be included in the Contract unit price for sidewalks or other items associated with the work.

Sawcutting, removal, and disposal of existing pavement or sidewalk sections, 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 Prices for Concrete Sidewalks or the item associated thereto.

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 have legal access.

301.2 Construction Methods: When a scheme for maintenance of traffic that may include detours 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 Traffic Signs and Barricades: The Contractor will furnish 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 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.

301.5 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.

301.7 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.

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.

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.

318.0 PAINTED PAVEMENT MARKINGS

318.1 General: This item shall conform to Section 12.09 PAINTED PAVEMENT MARKINGS of the Form 816.

320.0 TRAFFIC SIGNS

320.1 General: This item shall conform to Section 12.08 SIGN FACE - SHEET ALUMINUM, of the Form 816, amended as noted below.

All traffic and parking signs shall conform to the latest revision of the "Manual on Uniform Traffic Control Devices" conventional road size, the "Standard Highway Signs" book and the "Connecticut Department of Transportation Catalog of Signs".

All signs shall be sheet aluminum, 0.08 inches thick.

All signs except shall be retroreflective sheeting, high intensity grade, ASTM Type III.

Sign posts shall meet the requirements of the Connecticut Department of Transportation galvanized Type II, 3 lbs/ft breakaway channel posts.

320.2 Method of Measurement: This work will be measured for payment by the number of each sign of the type specified, installed and accepted.

320.3 Basis of Payment: This work will be paid for at the Contract unit price for each of the type of sign specified complete in place, which price shall include the completed sign, metal sign post(s), break-away base, and all materials, equipment, labor and work incidental thereto.

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 to 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 $\frac{3}{4}$ " 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 Non-Pay Item

404.01 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.

404.02 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.

404.03 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.

404.04 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 as 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 or 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.

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 drainage systems with existing systems, 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, gravel fill, bedding material and all other materials, equipment, tools, and labor incidental thereto.

407.0 CATCH BASINS 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.

Storm drainage manholes shall not be included under this item, but shall conform to Section 508.0 MANHOLES of these specifications.

407.2 Method of Measurement: There will be no direct measurement for trench excavation 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 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.

408.0 DRY WELLS

408.1 General: Dry wells shall consist of pre-cast concrete leaching galleries of the size and type shown on the plans, and shall be surrounded by an envelope of 2-inch stone and protected with an approved geotextile fabric, as shown in the construction details. Each drywell shall also include a catch basin top or manhole frame and cover as shown on the construction drawings, as well as necessary PVC piping for connection of drywells to the roadway drainage system.

408.2 Materials: Pre-cast concrete leaching galleries shall be designed in conformance with ASTM C913 and shall be designed to support HS-20-44 loading. Concrete shall have a 28 day compressive strength of 5,000 PSI. Deformed steel reinforcing shall conform to ASTM A615-68 (Grade 60). Knock outs shall be provided as required to accommodate the piping layout shown.

PVC PIPE: Shall be SDR-35.

2-INCH STONE: Shall conform to ConnDOT Form 816, M.01.01 for No. 3 Stone.

GEOTEXTILE FABRIC: Shall be TC Mirafi Filterweave 401 or approved equal.

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, sandholes, 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.

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.

408.3 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.

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.

408.4 Method of Measurement: There will be no direct measurement for earth trench excavation in the installation of the dry wells, rather the cost of this work shall be included in the unit price for each dry well.

There will be no direct measurement of 2-inch stone, filter fabric, catch basin tops, or manhole frames and covers, rather the cost of these items shall be included in the unit price for each dry well.

408.5 Basis of Payment: The work under these items shall be paid for at the unit contract price for each drywell, complete in place, 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.

409.0 CULVERT ENDS

409.1 General: These items shall conform to Section 6.52 CULVERT ENDS of the Form 816, modified as follows:

409.2 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.

409.2 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 drainage systems with existing systems, but the cost thereof shall be included in the contract unit price per linear foot for the size and type of pipe being installed.

Concrete footings for culvert ends as shown in the construction details will also not be measured for payment, but rather included in the contract unit price for each culvert end.

409.3 Basis for Payment: The work under these items will be paid for at the contract unit price per each size specified, complete in place, including trench excavation, gravel fill, bedding material, concrete footing, and all other materials, equipment, tools, and labor incidental thereto.

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.

420.0 RIPRAP

420.1 General: This item shall conform to Section 7.03 RIPRAP, of the Form 816.

420.2 Method of Measurement: The quantity of riprap measured for payment shall be the number of square yards of riprap apron, splash pad, or scour hole whose length and width are measured in place as accepted and thickness as shown on the plans.

There will be no direct measurement for trench excavation in the installation of the riprap.

420.3 Basis of Payment: This work will be paid for at the contract unit price per square yard for the type of riprap indicated, complete in place, including all materials, excavation, equipment, tools, and labor incidental thereto.

422.0 STONE FILTER BERM

422.1 General: Work of this item shall generally consist of construction of stone filter berms located and detailed on the contract drawings. Work shall include base preparation and excavation as necessary.

422.2 Materials:
Riprap shall conform to Section 7.03 RIPRAP of the Form 816.

Crushed stone shall conform to section M.02.03 of the Form 816 and be 3/8" to 3/4" in size.

422.2 Measurement and Payment: The work under this item shall be paid at the contract unit price per linear foot of filter berm constructed per contract drawings and as measured in the field. The unit price shall include all materials, equipment, labor, excavation, and tools incidental to the construction.

501.0 CRUSHED STONE SEWER PIPE BEDDING

501.01 General: The Contractor shall lay and cover all sanitary sewer pipe in a bedding of compacted crushed stone or as directed by the Engineer.

501.02 Crushed Stone Foundation Bedding: Unless otherwise provided or directed by the Engineer for a particular portion of a project, all pipe used for main sewers, laterals, connected thereto, or for catch basin drains shall be laid on a foundation of six inches of ¾-inch crushed stone as required by the Engineer.

Crushed stone shall be placed in the trench to a sufficient height so that upon completion of compaction, as required in the specifications, the entire upper surface of the crushed stone shall be no lower than the bottom of the barrel of the pipe to be laid thereon. The upper surface of the crushed stone shall be shaped as necessary to provide proper grade for the pipe to be laid thereon, bell holes shall be made in the crushed stone so that the pipe shall be supported on its barrel portion only, and the pipe laid thereon to line and grade in the manner described in the specifications.

When the pipe is properly positioned, crushed stone, unless otherwise required by the Engineer, shall be pulled or scraped up against the pipe suitably rammed into place along the barrel of the pipe only to firmly hold the pipe in position. Care shall be taken during these operations to assure that the pipe shall not be disturbed.

501.03 Crushed Stone Haunching: Unless otherwise provided for a particular portion of a project, all pipe used for main sewers, laterals connected thereto, or for catch basin drains in sizes up to and including 12-inch and plastic pipe larger than 12-inch size shall be haunched with crushed stone from the crushed stone foundation to a point at least half-way up the side of the pipe and to this same elevation out to the trench wall. The size of the crushed stone shall be ¾-inch. Care shall be taken when placing this crushed stone haunching to assure that the pipe shall not be disturbed. The Contractor shall use any means necessary to assure firm compaction of this crushed stone haunching and adequate side support for the pipe.

501.04 Pipe Laid in Rock Trench: In trenches excavated through rock, the rock shall be removed so that on projecting points or spurs of rock project within the limits described elsewhere herein as minimum clearances for rock excavation. The average clearances on sides of pipe shall be not less than six inches for pipe 18 inches or less in size, eight inches for larger pipe. The bottom of the trench will then be filled with crushed stone, as required or ordered.

In filling under, around, and directly over pipe laid in rock cuts, no fragments of broken rock more than three inches in longest dimension will be allowed to be placed within four inches of any part of the pipe. No fill of larger rock fragments will be allowed on sides of pipe or until pipe has been covered to a depth of at least one foot with fine, compacted material.

501.05 Crushed Stone Bedding on a Synthetic Drainage Fabric: At locations indicated on the plans and as directed by the Engineer, the Contractor shall furnish and place crushed stone bedding on a synthetic drainage fabric. The synthetic drainage fabric shall be Mirafi 140 Fabric as manufactured by Fiber Industries, Inc., subsidiary of Celanese Corporation, or it shall be an approved equal product.

Mirafi 140 or any material proposed as an equal shall conform to the following requirements: (1) The fabric shall be constructed from two types of continuous filament

fibers, one being a polypropylene fiber and the other being a fiber with polypropylene core and nylon sheath. Further, the fabric shall be a random mixture of these fibers formed into a sheet by heating bonding. (2) The fabric shall be rot-proof. (3) The fabric shall not be significantly affected by alkalies and weak acids with PH equal to or greater than 3.0 store fabric prior to use where it will not be exposed to sunlight.

The Contractor shall furnish specifications for, and a sample of, any material proposed as an alternate to Mirafi 140. The Engineer will make comparisons to the specifications for the sample of Mirafi 140 fabric and will make the final decision on the equality.

The Contractor shall provide notarized certification that any alternative material does meet the requirements of these specifications.

The synthetic drainage fabric shall be installed in a trench with a smooth surface bottom, and any sharp object shall be removed to avoid fabric punctures. The fabric shall not be placed until the Engineer has approved the surface upon which it will be placed.

The laying of fabric shall be scheduled such that the lengthy exposure of the fabric to sunlight will be avoided. The fabric shall be placed in double layers on the bottom of trench and turned up at trench sides to the height shown on the plans, or as directed by the Engineer. Fabric shall be laid smoothly. At joints, fabric shall be overlapped at least three feet. Inadvertent tears or punctures in the fabric may be repaired by placing an additional layer of fabric over tear or puncture with an overlap of three feet from the damaged area.

After the fabric has been placed and approved by the Engineer, crushed stone bedding shall be placed and compacted to dimensions as shown on the plans or as directed by the Engineer. If the fabric is punctured during placing of the stone, fabric shall be repaired to the satisfaction of the Engineer at the expense of the Contractor.

501.06

Payment: Unless otherwise specified, payment for Crushed Stone Sewer Pipe Bedding shall be included in the unit price for Polyvinyl Ch, including disposal of surplus excavated material, placing of synthetic drainage fabric, crushed stones, processed gravel, and all materials, tools, equipment, and labor incidental thereto.

502.0 SANITARY SEWERS

502.01 General: The Contractor shall furnish all materials, labor, tools and equipment and shall construct the polyvinyl chloride sanitary sewer mains as indicated on the drawings and as herein specified.

502.02 Pipe: The requirements of this specification are to provide pipe and fittings suitable for non-pressure drainage or sewage and certain other liquid wastes where toughness, resistance to deterioration from the action of water and chemicals, dimensional stability, resistance to aging and tight joints are required.

502.03 Materials: The pipe and fittings shall be made from Virgin Type 1, Grade 1 polyvinyl chloride compounds as defined and described in ASTM Specification D-1784 for "Rigid Poly (Vinyl Chloride) Compounds and Chlorinated Poly (Vinyl Chloride) Compounds".

Clean rework material, generated from the manufacturer's own pipe or fitting production, may be used by the same manufacturer provided the pipe and fittings so produced meet the requirements of this specification.

502.04 Physical and Chemical Properties: The physical and chemical properties shall conform to those minimums specified for Type 1, Grade 1 polyvinyl chloride compound designated in ASTM Specification D-1784 noted above.

502.05 Dimensions: The standard length of pipe used in house connections and/or laterals shall not exceed 6.5 feet in length unless otherwise approved by the Engineer.

The pipe shall be manufactured to the following dimensions:

NOMINAL SIZE	OUTSIDE DIAMETER	MINIMUM SDR-42	WALL THICKNESS SDR-35
6	6.275	0.180	0.180
8	8.400	0.200	0.240
10	10.500	0.250	0.300
12	12.500	0.300	0.360

All dimensions to inches.

Fittings shall be made in sizes, and to the dimensions of standard pipe, as shown above. If dimensions, structural design, or materials from which they are manufactured vary from other provisions of this specification, it shall be done so with the approval of the Engineer.

502.06 Joints: Joints shall be the bell and spigot type subject to the approval of the Engineer.

All joints shall meet the requirements of ASTM D 3212 Standard Specifications for "Joint and Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals". Joints shall be sealed with a rubber compression gasket, approved by the Engineer and shall be of a composition and texture which is resistant to common ingredients of sewage, industrial wastes, including oils and ground water, and which will endure permanently under the conditions likely to be imposed by this use. The tensile strength shall be at least 1,300 psi. The elongation at rupture shall be such that two-inch gauge marks shall stretch to not less than ten inches. Hardness shall be between 40 and 50, as measured with a Shore Durometer. The compression set (constant deflection) shall not exceed 25 percent

of the original deflection. The tensile strength after accelerated aging joint, when assembled, must be able to withstand a hydraulic pressure internally of at least 10 psi.

502.07 Fittings: Wyes, tees, bends, and adapters, and any other fittings required by the Engineer shall be provided. Plans for such fittings showing cross-sectional views with dimensions shall be provided, and such plans and fittings shall be approved by the Engineer prior to their use. The materials used in the manufacture of fittings shall conform with the requirements for the pipe with which they shall be used and any variation of such requirements shall be subject to the approval of the Engineer.

502.08 Testing: Pipe shall be tested when requested by the Engineer, and all sizes of pipe so designated shall be tested as follows:

Pipe shall be tested in accordance with ASTM D-2412-68 Standard Method of "Test for External Loading Properties of Plastic Pipe by Parallel-Plate Loading".

The minimum value of pipe stiffness at five percent deflection computed from data obtained from the above testing procedure shall be indicated in Table 1.

TABLE 1

Minimum Value of Pipe Stiffness at 5% Deflection

NOMINAL PIPE SIZE	PIPE STIFFNESS
6 Inch	32 PSI
8 Inch	28 PSI
10 Inch	17 PSI
12 Inch	17 PSI

502.09 Marking: Pipe shall be marked along the outside of the barrel in bold type and shall indicate the manufacturer's name, pipe size, PVC compound used, i.e. PVC Type 1, Grade 1 and the ASTM material specification for the PVC compound used, i.e. ASTM D-1784.

502.10 Workmanship: The pipe and fittings shall be homogeneous throughout and free from visible cracks, holes, foreign inclusions or other injurious defects. The pipe shall be as uniform as commercially practical in color, opacity, density and other physical properties.

502.11 Waterstops: The manufacturer shall provide waterstops acceptable to the Engineer which shall be applied to the outside of plastic pipe when the pipe is to be enclosed in a structure where concrete or mortar is used which will prevent leakage along the outer wall of the barrel of the pipe.

502.12 Allowable Pipe Deflection: Plastic pipe provided under this specification shall be so installed in the ground that a deflection of no more than five percent can be anticipated. Such deflection shall be computed by dividing the amount of deflection (nominal diameter less minimum diameter when measured) by the nominal diameter of the pipe.

However, between any two adjacent manholes, the average deflection shall not exceed six percent and no deflection at any point in the pipe shall exceed seven percent, computed in the manner described herein.

After an initial inspection and, if in the opinion of the Engineer the deflection may be excessive, the Engineer may order the Contractor to arrange for and take accurate measurements of the pipe at whatever intervals and at whatever locations between such adjacent manholes the Engineer deems advisable.

All costs involved in taking measurements ordered by the Engineer following the initial inspection shall be borne by the Contractor if the deflection in the pipe exceeds either of the maximum limits specified herein. If neither of the maximum limits are exceeded, all costs shall be borne by the Town.

502.13 Pipe Straightness: No single piece of pipe shall be laid on any project covered by these detailed specifications unless it is found to be generally straight. Such pipe shall have a maximum ordinate as measured from the concave side of the pipe not to exceed 1/16-inches per foot of length. If the deviation from straightness exceeds this requirement, then the particular piece of pipe shall be rejected for use until it can comply with this provision. This molded bell of each pipe section shall be concentric and true with the wall and theoretical center line axis of the pipe barrel. If the deviation from straightness exceeds these requirements and/or the molded configuration of the bell with respect to the pipe axis is questionable, then the particular piece of pipe shall be rejected for use.

502.14 Certification: At the time of shipment, a copy of the manufacturer's test report or a statement by the seller accompanied by a copy of the test report shall be included with the pipe. The seller's statement or the manufacturer's report shall state that the material has been sampled, tested, and inspected in accordance with ASTM Specification D-3033 and that the pipe conforms with these specifications.

502.15 Handling Pipe: All pipe shall be stored at the site until installation in a manner acceptable to the Engineer which will keep the pipe at ambient outdoor temperatures. Temporary shading shall be provided as required to meet this requirement. Simply covering the pipe or structures which allows temperature build-up when exposed to direct sunlight will not be permitted.

Each pipe unit shall be handled into its position in the trench only in such manner and by such means as acceptable to the Engineer. Care shall be taken to avoid damaging the pipe and fittings.

502.16 Installation: Each pipe unit shall be inspected before being installed. No single piece of pipe shall be laid unless it is generally straight. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1/16-inch per foot of length. If a piece of pipe fails to meet this requirement for straightness, it shall be rejected and removed from the site. Any pipe unit or fitting discovered to be defective either before or after installation shall be removed and replaced with a sound unit.

Except as otherwise indicated on the drawings, the pipe shall be supported by compacted crushed stone. No pipe or fitting shall be permanently supported on saddles, blocking, or stones. Crushed stone shall be as specified under Section 501 CRUSHED STONE SEWER PIPE BEDDING.

Suitable bell holes shall be provided so that after placement, only the barrel of the pipe receives bearing pressure from the supporting material.

All pipe and fittings shall be cleared of all debris, dirt, etc. before being installed and shall be kept clean until accepted in the complete work.

Pipe and fittings shall be installed to the lines and grades indicated on the drawings or as required by the Engineer. Care shall be taken to ensure true alignments and gradients.

Before any joint is made, the previously installed unit shall be checked to assure that a close joint with the adjoining unit has been maintained and that the inverts are matched and conform to the required grade. The pipe shall not be driven down to the required grade by striking it with a shovel handle, timber, or other unyielding object.

All joint surfaces shall be cleaned. Immediately before jointing the pipe, the bell or groove shall be lubricated in accordance with the manufacturer's recommendation. Each pipe unit shall then be carefully pushed into place without damage to pipe or gasket. Suitable devices shall be used to force the pipe units together so that they will fit with a minimum open recess inside and outside and have tightly sealed joints. Care shall be taken not to use such force as to wedge apart and split the bell or groove ends.

Joints shall not be "pulled" or "cramped" unless permitted by the Engineer.

Where any two pipe units do not fit each other closely enough to enable them to be properly jointed, they shall be removed and replaced with suitable units and new gaskets.

Details of gasket installation and joint assembly shall follow the direction of the manufacturers of the joint material and of the pipe, all subject to review by the Engineer. The resulting joints shall be water tight and flexible.

All pre-molded gasket joint polyvinyl chloride pipe of a particular manufacturer may be rejected if there are more than five unsatisfactory joint assembly operations or "bell breaks" in 100 consecutive joints, even though the pipe and joint conform to the appropriate ASTM Specifications as hereinbefore specified. If the pipe is unsatisfactory as determined above, the Contractor shall, if required, remove all pipe of that manufacturer of the same shipment from the work and shall furnish pipe from another manufacturer which will conform to all of the requirements of these specifications.

Open ends of pipe and branches shall be closed with polyvinyl chloride stoppers secured in place in an acceptable manner.

After each pipe has been properly bedded, enough crushed stone shall be placed between the pipe and the sides of the trench and thoroughly compacted to hold the pipe in correct alignment. Bell holes provided for jointing shall be filled with crushed stone and compacted and then crushed stone shall be placed and compacted to complete the pipe bedding as indicated on the drawings.

The Contractor shall take all necessary precautions to prevent flotation of the pipe in the trench.

At all times when pipe installation is not in progress, the open ends of the pipe shall be closed with temporary watertight plugs, or by other acceptable means.

If water is in trench when work is to be resumed, the plug shall not be removed until suitable provisions have been made to prevent water, earth, or other substances from entering the pipe.

Pipelines shall not be used as conductors for trench drainage during construction.

502.17

Cleaning: Care shall be taken to prevent earth, water, and other materials from entering the pipeline. As soon as possible after the pipe and manholes are completed, the

Contractor shall cleanout the pipeline and manholes, being careful to prevent soil, water, and debris from entering any existing sewer.

502.18

Measurement and Payment: Sanitary Sewer Mains will be measured and paid by the actual number of linear feet of sanitary sewer pipe complete and accepted in place. The measurement shall be along the horizontal projection of the centerline of the completed sewer, the length of manhole inverts (as measured between the inside walls of the manholes) being deducted. The unit price shall include: removal of bituminous pavement; trench excavation; sheeting; shoring and bracing; dewatering; crushed stone; fittings; and making of connection to existing pipes; pipe tests; sand backfilling, backfilling with suitable excavation material; disposal of surplus excavated material; cleaning pipelines and appurtenances; resetting; replanting; replacing or rebuilding items removed; and other work associated with the furnishing and laying of the pipe, which work is not measured and paid for elsewhere.

The following related items will be measured for payment under separate items: Rock-in-trench excavation; sanitary sewer laterals; and manholes.

506.0 SANITARY SEWER LATERALS

506.01 General: The work under this item shall consist of the construction of building connection laterals in accordance with details as shown on the plans and as specified herein. Construction shall be at locations shown on the plans or as determined by the Engineer.

506.02 Material: Pipe material for building lateral connections shall be that which is approved by the Engineer and in most instances it would be the same material as that used for the main sewer line. When reinforced concrete pipe is used for main sewer line, a pipe of an acceptable material as specified in the contract documents or as approved by the Engineer shall be used for the lateral connections. The size of pipe shall be six inches, unless otherwise specified on the plans or directed by the Engineer. The Contractor shall furnish stoppers for plugging the unconnected ends of laterals. Stopper configuration shall be as recommended by the manufacturer of the lateral pipe as approved by the Engineer. Stoppers shall be watertight once installed.

506.03 Construction Methods: Lateral connections shall be of six-inch or larger pipe laid to the grade and to the points ordered. They will not be laid on a grade flatter than one percent, and will usually have eight feet of cover at the curb or street line in most residential streets or zones. On business streets, or streets adjacent to the business section of the city, or where the adjacent land is low, they will have not less than ten feet of cover at the curb, if possible. If so directed, the whole of the trench shall be dug to the required grade before any pipe is laid herein, and the pipe shall be laid closely to line and grade, using a grade line, hand level, or straight edge as may be ordered.

House lateral connections will generally be laid at right angles to the main sewer from Y-branches on sewers by means of 45-degree bends of approved form, or from inlets built into other sewers. The Contractor shall take proper means to temporarily locate all wyes, etc. in the main sewer before connections are laid and will be responsible for finding wyes, etc. from which the Contractor is to lay connections or laterals.

Extra care shall be taken to make smooth, close-fitting joints at all bends. Pipes shall be trimmed or extra bends used when ordered to accomplish this, without extra charge. So far as possible, every pipe shall be swabbed out inside after being installed. All requirements for laying pipe of this size, as described elsewhere herein, shall be observed in laying lateral connections so far as those requirements apply. The end of each lateral connection shall be closed with an approved stopper.

Stoppers shall be watertight and yet be installed in a manner which would allow them to be removed with reasonable ease without causing damage to any portion of the lateral.

A stout stake to mark the location and elevation of the end of each lateral will be driven as directed by the inspector near the end of each lateral.

This stake will be protected and maintained undisturbed until the Engineer has completed all his measurements and, if so ordered, will thereafter be removed by the Contractor.

Except where otherwise indicated or ordered, house lateral connections will be of six-inch pipe. If pipe larger than six inches is ordered in a lateral or connection where such larger size had not previously been indicated, and where the price for lateral or connection was based on use of six-inch pipe, the Contractor will be paid the additional cost of the larger size pipe over and above what would have been the cost of equivalent six-inch pipe and fittings.

506.04 Sheeting at Branches: Sheeting shall be cut away and removed from in front of capped wyes and other branches or inlets in sewer for future connections to permit conveniently finding them and making future connections with them. If required by drawings or directed by the Engineer, a 45-degree bend will be set in Y-branches or a short piece of pipe set into inlets left in the sewer, the end of the bend or pipe stub being capped in the manner described previously so that a future connection can be made thereto without excavating against the side of the main sewer.

506.05 Markers at Branches: A piece of lumber not less than two-inch by four-inch will be set vertically and left in place, extending from a point directly in front of, but not in contact with, the capped end of the lateral connection to a point about two feet below the ground surface or finished street grade to guide persons who in future years may have occasion to excavate to find the connections, and to protect the end of the lateral connection from damage when making such excavation.

506.06 Existing House or Catch Basin Drains Relayed: When connections or laterals are indicated to be connected to existing drains at the side of the road, they shall be of the same size as that drain. Whenever the Engineer shall consider it necessary in order to maintain the flow of the old drain or to properly drain the connection trench while relaying the drain, the Contractor shall place a six-inch Y-branch near the main sewer to provide temporary drainage. Any such wye shall be closed and capped when the connection is complete.

Drains re-laid and connected to existing house drain or catch basin at the side of the road will be measured as described for new lateral connections.

506.07 Drains Connected at Trench: Where existing drains are encountered and are to be reconnected to the new sewer at the side of the main trench, they shall be connected as directed by the Engineer, either by means of a chimney with suitable pipe and fittings at the top to make connection to the old drain, or by cutting slightly into the bank at the side of the trench, setting a Y-branch, or suitable fitting in the new line, and installing such pipe, bends and fittings as may be needed to make a satisfactory connection. Pipe and fittings set into the bank of the trench must be supported and secured in place by concrete or selected, well-compacted fill, as may be directed.

Pipe and fittings used for such work shall, so far as possible, be of the same size as the old drain to be connected, but in no case less than six inches in size. Special care must be exercised to be sure that all joints are smooth inside, and tight, and that all pipes, bends, etc. are well-fitted and securely held in place and supported. Connections to the sanitary sewer shall not be made for pipe lines which carry storm or ground water.

506.08 Method of Measurement: Where lump sum prices are to be paid for laterals, the stated length thereof is the horizontal distance from the center of the sewer to the curb, street, or other line within which the pipe must be laid. When payment is per foot, the length shall be the actual length laid from the centerline of the main sewer, measured at right angles thereto from said center to the first straight pipe, then along the flow line of the lateral to a point vertically beneath the line within which said lateral extends.

The following items will not be measured for payment: removal of bituminous pavement, removal of concrete pavement unless defined as rock under Section 103.02, trench excavation, sheeting, shoring and bracing, dewatering, crushed stone bedding, laying and jointing pipe, pipe tests, sand blanket backfill, backfilling with suitable excavated material, disposal of surplus and unsuitable excavated materials, cleaning pipelines and appurtenances, tees, wyes, fittings, markers, and all other work incidental to the

construction of sanitary sewer lateral connections. The cost of this work and these materials shall be included in the unit price for this item.

506.09 Payment: The payment for sanitary sewer laterals shall be the price or prices named in the proposal, which shall be full compensation for all labor, material, and maintenance connected therewith.

Rock excavation, if required, will be paid for at the Contract unit price bid for "Rock Excavation," as provided for in the Proposal.

507.0 PIPE TESTS

507.01 General: The pipeline shall be made as nearly watertight as practicable, and pipe tests and measurements shall be made after the pipeline has been backfilled.

Where the groundwater level is more than one foot above the top of the pipe at its upper end, the Contractor shall conduct an infiltration test. However, if the groundwater level is four feet or less at this point, a low pressure air test may be performed instead. Where the groundwater is less than one foot above the top of the pipe at its upper end, the contractor shall conduct either exfiltration or low pressure air tests as determined by the Engineer.

Tests will be made after the pipe installation is complete including all laterals as indicated on the plan, manholes are installed, and backfill in the trench has been placed and compacted or consolidated as required by the Engineer.

507.02 Visual Alignment Test: Upon completion of a section of pipe, a visual inspection will be made by the Engineer. All associated appurtenances installed in conjunction with the installation of the pipeline will also be examined for compliance with these specifications.

Prior to the visual inspection, the contractor shall ensure that the line has been properly cleaned of all foreign materials that might have entered the pipeline.

The visual alignment test will include the mirroring of all pipelines, and if, in the opinion of the Engineer, the installed pipe does not conform to the alignment indicated on the drawings, or does not satisfy the requirements outlined under "Allowable Pipe Deflection", the Contractor shall take accurate measurements as outlined elsewhere within these specifications. All pipeline determined to be outside the noted tolerances shall be corrected to the satisfaction of the Engineer at no cost to the Town.

507.03 Low Pressure Air Test:

a. General:

When the Engineer specifies or directs that pipe tests shall be made using the low pressure air test method, the Contractor will be required to provide all equipment, test plugs in the required sizes, appurtenances, connecting hose or pipe, labor, and materials necessary to conduct and control the test as herein specified.

The tests may be conducted by the Contractor using the contractor's equipment, or a subcontractor approved by the Engineer. All equipment proposed for use in conducting the low pressure air test shall be subject to the approval of the Engineer. The Contractor shall submit shop drawings on the proposed equipment for review by the Engineer. These shop drawings must be in sufficient detail to show the details, set-up, and proposed operation of the low pressure air test equipment, and no testing will be permitted without prior approval of the proposed equipment by the Engineer.

b. Procedure:

The Contractor shall determine the elevation of the groundwater table in the area of the pipeline being subjected to the low pressure air test in a manner approved by the Engineer.

After cleaning and flushing the line, test plugs will be installed in the pipeline being subjected to the low pressure air test, and braced as necessary to secure the plugs in place.

Utilizing the approved equipment, air at low pressure will be slowly introduced into the pipeline until the pressure within the pipeline being tested increases to 4 PSIG greater than the back pressure exerted by the groundwater table over the pipe being tested (back pressure = 1 PSIG per 2.31 feet of water), as determined above. If the water table is not a level above the pipe, the test pressure should be brought up to 4 PSIG. Allow at least two minutes to elapse prior to starting the test. If necessary, allow a small amount of air to slowly enter into the pipeline in order to maintain a pressure of 4 PSIG above the back pressure due to the water table, or 4 PSIG if there is no back pressure to compensate for.

At this point, start measuring the time for the pressure in the pipeline to drop 1 PSIG.

The time necessary to drop 1 PSIG shall not be less than that indicated in Table 507-1 for the size and length of pipeline being tested. If the time is less than that indicated in Table 507-1, the line will be considered as having failed the test.

Any section of pipeline which fails to meet this test will be repaired or replaced as necessary by the Contractor, and retested at no additional expense to the Town.

No pipeline will be considered acceptable until it successfully passes the requirements of this test.

All testing will be conducted by the Contractor or his approved subcontractor in the presence of the Town's inspector. The contractor or subcontractor shall keep a written record which will show the results of the tests conducted. The records should include sufficient data on length of line, pressure levels, time for pressure drop, and related features noted during the testing of each segment of the line. A copy of this record shall be given to the Town.

507.04

Infiltration Test:

a. Reinforced Concrete Pipe:

For making the infiltration tests, the Contractor shall furnish suitable test plugs, water pumps, and appurtenances, and all labor required to properly conduct the test.

The infiltration tests shall be made at a time when the groundwater is at least one foot above the top of the pipe of the highest section of work being tested.

Leakage into the reinforced concrete pipeline shall not exceed 500 gallons per inch diameter in 24 hours per mile of pipeline.

b. Other Sewer Pipe:

The Contractor shall furnish suitable test plugs, water pumps, and appurtenances, and all labor required to properly conduct the pipe tests on the pipeline.

For making the infiltration tests, underdrains, if used, shall be plugged and other groundwater drainage shall be stopped to permit the groundwater to return to its normal level insofar as practicable.

507.05 Exfiltration Tests: For making the exfiltration tests, the pipe shall be subjected to an internal pressure by plugging the pipe at the lower end and then filling the pipelines and manholes with clean water to a height of two feet above the top of the pipe at its upper end. Where conditions between manholes may result in test pressures which would cause leakage at the stoppers in branches, provisions shall be made by suitable ties, braces, and wedges to secure the stoppers against leakage resulting from the test pressure.

The rate of leakage from the pipe shall be determined by measuring the amount of water required to maintain the level two feet above the top of the pipe.

Leakage from the pipes under test shall not exceed the requirements for leakage into pipes as hereinbefore specified.

The equipment used to introduce the low pressure air into the pipeline shall include a safety valve or release device located in the equipment at a point which will ensure that during the build-up of test pressure, the pipeline being tested will not be subjected to an internal pressure that could damage a properly installed pipe.

All tests shall be conducted on the completed pipeline between manholes. Testing of shorter sections of pipeline will only be permitted with the approval of the Engineer.

Immediately prior to testing, all lines will be cleaned and flushed with water. Pipe manufactured in accordance with ASTM Specifications C-76, C-428, C-644 and/or C-700 shall be soaked for a period of 12 hours to saturate the pipe wall prior to testing with low pressure air.

All gages, controls, and appurtenances for equipment used to conduct the test will be located out of manholes. Connections to the line under test, test plugs, and other equipment will be made with hose or pipe extensions which will safely contain the pressures necessary to conduct and control the test.

The gage used to measure the drop in pressure shall have a four-inch diameter face with a scale of 0 to 15 PSI in 0.1 PSI increments, or as approved by the Engineer.

The Contractor is cautioned of the importance of properly installing the end caps used to plug hubs, wyes, bends, ends of laterals, and other inlets, and securing them against movement during the installation of pipe. Failure to take this precaution can cause a properly installed pipeline to fail the low pressure air test.

The Contractor is cautioned further regarding the safety of personnel during the test. Low pressure air can exert a substantial force on a test plug, even on small diameter pipe plugs. The Contractor will be responsible to ensure that all test plugs utilized are in good condition and that they will not be pressurized beyond the limits recommended by their manufacturer.

No one will be permitted in a manhole containing a test plug while air is under pressure in the pipeline being subjected to the test.

The pipes shall be tested before any connections are made to buildings.

The Contractor shall construct weirs or other means of measurements as may be required.

Suitable bulkheads shall be installed, as required, to permit the test of the pipe.

Should the sections under test fail to meet the requirements, the Contractor shall do all work of locating and repairing the leaks and retesting as the Engineer may require without additional compensation.

The water used to conduct an exfiltration test shall not be allowed to enter any active sewer.

If, in the judgment of the Engineer, it is impracticable to follow the foregoing procedures for any reason, acceptable modifications in the procedures shall be made as required, but in any event, the Contractor shall be responsible for the ultimate tightness of the line within the above test requirements.

Where water for the test is to be obtained from the Metropolitan District's water system or the Manchester water system, proper notification must be given them prior to any drawing of water from a hydrant. Refer to Section 406.03e entitled, "Puddling" for further information on the proper procedure to follow when using a fire hydrant as a source of water.

507.06

High Pressure Water Test: Except as otherwise directed, all pipelines shall be given combined pressure and leakage tests in sections of approved length. The Contractor shall furnish and install suitable temporary testing plugs or caps, all necessary pressure pumps, pipe connections, meters, gages, and other necessary equipment, and all labor required.

Subject to approval, and provided that the tests are made within a reasonable time considering the progress of the project as a whole, and the need to put the section into service, the Contractor may make the tests when the Contractor desires.

However, pipelines in excavation or embedded in concrete shall be tested prior to the backfilling of the excavation or placing of the concrete, and exposed piping shall be tested prior to field painting.

Unless it has already been done, the section of the pipe to be tested shall be filled with water of approved quality, and all air shall be expelled from the pipe. If blow-offs are not available at high points for releasing air, the Contractor shall make the necessary excavations and do the necessary backfilling and make the necessary taps at such points and shall plug said holes after completion of the test.

The section under test shall be maintained full of water for a period of 24 hours prior to the combined pressure and leakage test being applied.

The pressure and leakage test shall consist of first raising the water pressure (based on the elevation of the lowest point of the section under test and corrected to the gage location) to a pressure in pounds per square inch numerically equal to the pressure rating of the pipe, but not to exceed 150 PSI.

While maintaining this pressure, the Contractor shall make a leakage test by metering the flow of water into the pipe. If the average leakage during a two hour period exceeds a rate of ten gallons per inch of diameter per 24 hours per mile of pipeline, the section shall be considered as having failed the test. All joints within chambers and all flanged joints shall have no visible leakage.

507.07 Payment: No separate payment shall be made for this item, rather, payment shall be made under the related bid item. The Contractor will be responsible for all costs and delays incurred due to efforts to locate and repair leaks in any pipeline which fails the low pressure air test, regardless of whether the failure is due to workmanship, material failure, the result of an improperly installed or braced end cap, or any pipeline damaged due to improper testing procedure. Payment made under the appropriate item shall be considered full compensation for conducting the specified test.

TABLE 507-1

LOW PRESSURE AIR TEST SPECIFICATIONS

MINIMUM TIME REQUIRED (MINUTES:SECONDS)
 FOR A PRESSURE DROP OF 1 PSIG
 (BASED ON 0.003 CFM/SQ.FT. AND 2.0 CFM)

PIPE DIAMETER D IN INCHES

LENGTH OF SECTION BEING TESTED IN FEET	<u>6"</u>	<u>8"</u>	<u>10"</u>	<u>12"</u>	<u>15"</u>	<u>18"</u>
25	0:10	0:18	0:28	0:40	1:02	1:29
50	0:20	0:35	0:55	1:19	2:04	2:58
75	0:30	0:53	1:23	1:59	3:06	4:27
100	0:40	1:11	1:50	2:38	4:08	5:56
125	0:50	1:28	2:18	3:18	5:09	7:26
150	0:59	1:46	2:45	3:58	6:11	<u>8:30</u>
175	1:09	2:03	3:13	4:37	<u>7:05</u>	↓
200	1:19	2:21	3:40	5:17	↓	↓
225	1:29	2:38	4:08	<u>5:40</u>	↓	↓
250	1:39	2:56	4:35	↓	↓	↓
275	1:49	3:14	<u>4:43</u>	↓	↓	↓
300	1:59	3:31	↓	↓	↓	↓
350	2:19	<u>3:47</u>	↓	↓	↓	↓
400	2:38	↓	↓	↓	↓	↓
450	<u>2:50</u>	↓	↓	↓	↓	↓
500	2:50	3:47	4:43	5:40	7:05	8:30

Note: if the section of pipe to be tested is composed of both main line and more than a total of 100 feet of laterals, 1 minute 30 seconds must be added to the length of time indicated above for the test required for the main pipe.

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 or 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 suitably 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 Embecco 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 1/4-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, sandholes, 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 boot-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.

651.0 DUCTILE IRON PIPE AND FITTINGS

651.1 General: The work specified in this section includes furnishing and installing ductile iron pipe and fittings to the lines and grades shown on the Contract Drawings complete as shown, specified or directed. The work includes, all as shown, specified or directed, transporting materials, clearing, trenching, disposing of unused excavated materials, removing and disposing of sections of the present water mains and concrete anchors, furnishing, installing and field testing the pipelines complete with lacings and harnessing, and utility identification tape, refilling trenches, furnishing additional material for refilling, temporary surface restoration, miscellaneous grading, permanent unpaved surface restoration and resetting miscellaneous items, bracing, pumping and all incidental work, except as otherwise provided for.

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

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

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

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

- a. ANSI/AWWA C104/A21.4 - AMERICAN NATIONAL STANDARD FOR CEMENT - MORTAR LINING FOR DUCTILE-IRON PIPE AND FITTINGS FOR WATER.
- b. ANSI/AWWA C110/A21.10 - AMERICAN NATIONAL STANDARD FOR DUCTILE-IRON AND GRAY-IRON FITTINGS, 3-INCH THROUGH 48-INCH, FOR WATER AND OTHER LIQUIDS.
- c. ANSI/AWWA C111/A21.11 - AMERICAN NATIONAL STANDARD FOR RUBBER-GASKET JOINTS FOR DUCTILE-IRON AND GRAY-IRON PRESSURE PIPE AND FITTINGS.
- d. ANSI/AWWA C151/A21.51 - AMERICAN NATIONAL STANDARD FOR DUCTILE-IRON PIPE, CENTRIFUGALLY CAST IN METAL MOLDS OR SAND-LINED MOLDS, FOR WATER AND OTHER LIQUIDS.
- e. ANSI/AWWA C153/A21.53 - AMERICAN NATIONAL STANDARD FOR DUCTILE-IRON COMPACT FITTINGS, 3-INCH THROUGH 48-INCH (75 MM THROUGH 300 MM), FOR WATER AND OTHER LIQUIDS.
- f. ANSI/AWWA C600 - AWWA STANDARD FOR INSTALLATION OF DUCTILE IRON WATER MAINS AND THEIR APPURTENANCES.

651.4 Submittals: In accord with the General Conditions, detailed drawings as follows shall be submitted and no work shall be fabricated until they have been approved by the Engineer:

- a. Dimensions and general details for typical length of pipe.
- b. Detail of joint between pipes for both push-on and restrained joints together with installation instructions.
- c. Dimensions and general details for all fittings including joint details for both mechanical and restrained joints.
- d. Location plan or lists showing number of pipes and fittings and other such information as needed for installation.

Prior to furnishing the pipe-laying schedule, test pits shall be dug where the new pipe connects to the present water main to ascertain the location, elevation and cross-sectional dimensions of the present mains. This information shall be forwarded to the pipe manufacturer for incorporation into the pipe-laying schedule.

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

651.5

Materials:

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

- a. All pipe shall be Class 54.
- b. All pipe shall be lined with double-thickness, cement-mortar in accord with ANSI/AWWA C104/A21.4, Section 4-8.2.
- c. All pipe shall have push - on joints employing a single elongated grooved rubber gasket as specified in ANSI/AWWA C111/A21.11, unless otherwise specified.
- d. All pipe will be coated inside and outside with an approved bituminous material in accordance with Section 4.12 of ANSI/AWWA C104/A21.4 and Section 51-9 of ANSI/AWWA C151/A21.51.
- e. The grade of ductile iron shall be 60-42-10.
- f. All pipe shall be marked in accord with Section 51.11 of ANSI/AWWA C151/A21.51.
- g. All requirements of the American National Standards Institute Specifications will be rigidly enforced.
- h. The grooved rubber gaskets and joint lubricant shall be furnished with the pipe. The gasket shall be plainly identified as to pipe size and packaged in a suitable and satisfactory manner for shipment.
- i. All joint accessories shall be furnished with each pipe and shall be plainly identified as to pipe size.

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

- a. All fittings shall be lined with double-thickness cement-mortar in accord with ANSI/AWWA C104/A21.4, Section 4-8.2, except sleeves, caps, and plugs.
- b. All fittings will be coated inside and outside with an approved bituminous material in accord with Section 4-12 of ANSI/AWWA C104/A21.4 and Section 10-9 of ANSI/AWWA C110/A21.10.
- c. All fittings shall have mechanical joints as specified in ANSI/AWWA C111/A21.11.
- d. All cast and ductile iron fittings shall have a pressure rating of at least 150 psi.
- e. Bolt holes in the mechanical joint bells of all fittings shall straddle the vertical centerline of the fitting (laying in horizontal position).
- f. All joints accessories shall be furnished with each fitting and shall be plainly identified as to size.
- g. Compact ductile iron fittings that meet AWWA specifications may be used if approved by the Engineer.

HARNESSING: Eyebolts and lacing rods shall be of A-36 steel as manufactured by Star National Products, Columbus, Ohio or approved equal. All components shall be hot-dipped galvanized.

Retainer glands for mechanical joints shall conform to ANSI/AWWA C111/A21.11 and the following additional requirements:

- a. All retainer glands shall be ductile iron and all retaining devices shall be heat treated ductile iron.
- b. All retainer glands shall have a minimum rated working pressure of 250 psi.

The retainer glands shall be Megalug Series 1100 as manufactured by EBAA Iron Sales, Inc. Eastland, Texas or approved equal.

Components of the harnessing system for push-on joint ductile iron pipe shall be in general accord with the above requirements for lacing rods and retainer glands. The harnessing system shall be the Series 1100HD Megalug Harness or Series 800 Coverall, both as manufactured by EBAA Iron Sales, Inc., Eastland, Texas or approved equal.

CALCIUM HYPOCHLORITE TABLETS AND SODIUM SOLUTION: The District will furnish the chlorination tablets and cement for pipes 12 inches and smaller. See Table 1 of Specification Section 653 for required number of chlorination tablets to be cemented to the pipe.

Sixteen inch pipe and larger will be injected with a hypochlorite solution by the District at no cost to the Contractor.

UTILITY IDENTIFICATION TAPE: Utility identification tape shall be 4-inches wide, designed to withstand extended underground exposure, colored blue and be durably imprinted with an appropriate warning indicating the presence of the buried pipe.

651.6

Construction Methods:

INSPECTION BEFORE INSTALLATION. Pipes and fittings shall be subjected to a careful inspection and a hammer test just before being laid or installed.

TRANSPORTING AND DISTRIBUTING PIPE. The pipe and fittings shall be transported from the place of manufacture, all permits which may be necessary shall be secured and the requirements of the Connecticut Department of Transportation, cities and towns, concerning heavy transporting over state, city and town highways shall be completed with.

During loading, transporting and unloading, more than ordinary care shall be taken to prevent injury to the pipes. Such work shall be done with each section of the pipe under the full control at all times and under no conditions shall a pipe be dropped on the ground. Pipes shall be placed on sand beds or other methods may be employed to avoid chances of the pipe being frozen to the ground surface.

In distributing the pipes in the field, as permitted, each piece shall be placed as near as possible to the point where it is to be installed and faced in the proper direction. In case any pipe received damage from handling or other cause and made unacceptable to the Engineer, it shall be replaced with a new pipe at no additional cost to the District. The Contractor is cautioned that state, city or town authorities may not permit storing pipe, etc., within street or highway limits.

TEST PITS. Test pits shall be dug at locations shown on the Contract Drawings or as directed by the Engineer sufficiently far in advance of the construction at the test pit location to allow time for any utility relocations that may be required to accommodate the new construction.

CLEARING TREES AND BUSHES. No trees within streets and highways, or adjacent to the normal trench therein, shall be damaged or removed unless so noted on the Contract Drawings. Any requirements in any permit relative to trees shall be adhered to.

In streets and highways where there is no permanent paving, only those trees, bushes or shrubs shall be removed and disposed of as may be required for construction and as approved by the Engineer. The unlimited removal of trees and brush will generally not be required or permitted.

LAYING DUCTILE IRON PIPE. Proper and suitable tools and appliances for safe and convenient handling and laying of pipe shall be used, and care shall be taken to prevent coating from being damaged, particularly on the inside of the pipes. Pipe work shall not be started until the following minimum equipment is available and on site:

1. Wheel pipe cutters, hydraulic pipe cutter or a pipe saw for the sizes of pipe to be laid;
2. Ratchet type socket wrenches for mechanical joint bolt and nuts;
3. At least two expandable pipe stoppers of the proper size for closing the end of the piping being laid when not actually laying pipe.

All pipes shall be carefully examined for defects and no pipe or other casting shall be laid which is known to be defective, and should any defective pipe or other casting be discovered after being laid, it shall be removed and replaced with a sound casting at no additional cost to the District.

The pipe shall be laid upon sound soil, cut true and even, so that the barrel of the pipe will have a bearing for its full length. In the event the trench is excavated below the grade of the bottom of the pipe, the trench will be brought up to grade with gravel, pneumatically tamped, before the pipe is laid.

The utility identification tape shall be placed approximately two (2) feet above the top of the pipe.

When not actually laying pipe (e.g. overnight, weekends, holidays, etc.) the open ends of the pipe shall be kept plugged with approved watertight nightcaps.

All necessary precautions shall be taken to prevent water from entering the pipe during installation of the pipeline.

Unless shown otherwise on the Contract Drawings or directed otherwise by the Engineer, the pipeline shall be installed a minimum of four (4) feet - six (6) inches below finished grade. The pipeline shall also be installed to provide at least eighteen (18) inches of vertical clearance between the water pipe and storm drains or sanitary sewers.

CUTTING PIPE. Whenever the pipes require cutting, an approved saw, wheel or hydraulic type cutter shall be used. This work shall be done at no additional cost to the District, in a manner satisfactory to the Engineer, and only experienced men shall be engaged thereon.

JOINTS. On pipe with rubber gasket push-on joints, the gasket shall be installed in the socket of the pipe previously laid and the gasket then lubricated. The plain end of the pipe being laid shall then be inserted and pulled or pushed to the full depth of the socket. An approved jack-type tool shall be used to assemble pipe 10-inches and larger. Plain ends of cut pipe shall be filed or ground to a taper to prevent damage to the gasket during the insertion.

On fittings, butterfly and gate valves with mechanical joints, the follower ring and rubber gasket shall be placed on the plain end of the pipe being (or previously) laid and entered into the socket of the fitting. The gasket shall then be evenly seated in the socket, the follower ring moved up the face of the gasket and the "T" bolts inserted and made finger-tight. The "T" bolts shall then be tightened with a ratchet or torque wrench to between 60 and 80 foot pounds.

HARNESSING. Where and as shown on the Contract Drawings, or as directed by the Engineer, retaining glands, eye bolts and lacing rods shall be installed, in accord with the standard lacing details shown for mechanical joint pipe or fittings.

The retaining glands shall be installed in lieu of the standard mechanical joint gland. The "T" bolts shall be tightened with a ratchet or torque wrench in accord with Appendix A of ANSI/AWWA C111/A21.11. Only then shall the wedge nuts be tightened in accord with the recommendations of the manufacturer. The joint is then complete.

The harnessing system for push-on joint pipe shall be installed in full accord with the recommendations of the manufacturers.

Other special lacing or harnessing, if shown on the Contract Drawing, or directed by the Engineer, shall be installed to the satisfaction of the Engineer.

CLEANING. Before, and after, if required, the installation of the pipeline, but prior to filling the line with water, the interior of the pipelines shall be cleaned to the satisfaction of the Engineer, by such means as the Engineer approves.

FILLING, DISINFECTION AND FLUSHING. Refer to Specification Section 653 for methods and standards regarding disinfecting and flushing water mains.

As soon as practicable after installation of the pipeline has been completed, the water main shall be filled, disinfected and flushed. Only District staff shall operate the water main valves. The Contractor will assist the District during the flushing of the pipeline(s). Erosion control measures shall be provided at no additional cost to the District. If the pipeline(s) is not connected to an existing operating water main, the pipeline(s) to be filled shall be temporarily connected to a District water main at no additional cost to the District. The Contractor will not be charged for the District water used in this operation.

- a. 12-inch Pipe and Smaller. The District will furnish calcium hypochlorite tablets and cement for pipes 12 inches and smaller. In the event water has entered the pipeline during installation, thereby rendering the hypochlorite tablets ineffective, or the pipeline must be dewatered to allow for repairs due to faulty installation, the District will disinfect the main by injecting a hypochlorite solution into the pipeline. The cost of this work, including installation of chlorination fittings, shall be paid for by deducting the cost thereof from any payment due the Contractor.
- b. 16-inch Pipe and Larger. The District will disinfect the pipeline by injecting a hypochlorite solution into the pipeline utilizing the chlorination valve and chlorination blow-off installed under this item.

Subsequent to disinfecting and flushing the water main(s), the District will test the water in accord with required state regulations. Should the water fail to pass the required physical, chemical and bacteriological parameters and it is determined that the failure was caused by the Contractor's operations, all costs for the flushing, re-disinfection, retesting, etc., shall be borne by the Contractor and any costs incurred by the District for reflushing, re-disinfection, retesting, etc. shall be deducted from any payments that may be due to the Contractor.

The District will attempt to minimize any damage that may occur during the filling, disinfection and flushing operations, however, any such minor damage shall be repaired and the cost thereof will be considered as included in the price bid per linear foot of pipeline.

FIELD TESTING. The pipeline shall be tested for leakage between test bulkheads and/or main line valves. The pipeline will be filled with water and tested in accord with the latest ANSI/AWWA C600 under a hydrostatic pressure of 132 PSI. Under the test pressure, all visible leaks shall be made tight to the satisfaction of the Engineer. The total leakage per 24 hours from the line thus tested shall not exceed 2.07 gallons per inch diameter per 1000 feet of pipeline as allowed in the latest ANSI/AWWA C600. Visible leaks shall be repaired even though the total leakage of the portion in question may be less than the above-mentioned permissible limit. Test pressure shall be applied for at least two hours and as much longer as required to permit inspection for leaks. Should the leakage exceed the maximum specified amount and investigation show this leakage to be at the joints or caused by defective work elsewhere, such defective work shall be repaired to the satisfaction of the Engineer or, if he so orders, the pipe or pipes shall be replaced at no additional cost to the District and repairs or replacement shall be continued and the test repeated until the leakage under the test pressure is within the limit prescribed and the work left in a manner entirely satisfactory to the Engineer.

The District will not charge the Contractor for District water used for testing. The Contractor shall be responsible for any damage to the pipeline or to adjoining property due to the testing.

651.7

Method of Measurement: The quantity of ductile iron pipe to be paid for will be the number of linear feet of ductile iron pipe and fittings installed, complete as shown, specified and directed. The length of pipe and fittings to be measured shall be the length of the line after the pipes and fittings have been installed, measured or computed along the center line of the pipe and fittings from the center line of the main line valves or face of the terminal pipe or fitting, as shown on the Contract Drawings.

Removal of existing water mains as necessary for performance of the work, including blow-off assemblies, fittings, and piping will not be measured for payment.

Pipe installed on hydrant or blow-off assemblies will not be measured for payment.

Earth excavation, including removal of bituminous or concrete pavement, will not be measured for payment but will be considered as having been included in the price bid per linear foot of pipeline.

The bank gravel from the bottom of the trench to the level 24 inches above the top of the pipe will not be measured for payment, but will be considered as included in the price bid per linear foot of pipeline.

Fittings, bends, and additional excavation necessary for offsetting the new water main under existing and proposed utilities will not be measured for payment.

Installation, maintenance, protection, and removal of the sterilization sample points will not be measured for payment.

Special Trench Refill necessary for the replacement of unsuitable material will not be measured for payment.

Utility identification tape will not be measured for payment, but will be considered as included in the price bid per linear foot of pipeline.

Support of excavation, dewatering, unpaved surface restoration and resetting miscellaneous items will not be measured for payment, but will be considered as included in the price bid per linear foot of pipeline.

651.8

Basis of Payment. This work will be paid for at the Contract unit price per linear foot for 12-inch Ductile Iron Pipe and Fittings, complete in place as provided for in the Bid Proposal.

The price shall include all work as described in Section 651 and all materials, tools, equipment and labor incidental thereto necessary to complete the pipelines in accord with the Contract Drawings, the Specifications and the requirements of the Engineer thereunder. No claim will be allowed because the number of pipes and joints may be greater than estimated by the Contractor.

No direct payment will be made for any work done or materials used in making the pipeline tight. No payment will be made under this item for valved, plugged, or blind flanged outlets or branches which contain no pipe. No direct payment will be made for any labor, materials or equipment required for the pipeline field testing.

Rock excavation, if required, will be paid for at the Contract unit price bid for "Rock Excavation," as provided for in the Proposal.

653.0 DISINFECTING AND FLUSHING WATER MAINS

653.1 Description: The work specified in this section describes methods of disinfecting newly constructed potable-water mains; mains that have been removed from service for planned repairs or for maintenance that exposes them to contamination; and potable-water mains that have undergone emergency repairs because of physical failure.

As soon as possible after installation or repair of the water main has been completed, the pipeline shall be filled, disinfected and flushed. ONLY District forces shall operate the water main valves. The Contractor installing water mains and appurtenances within the District service area is responsible for disinfecting water mains and pipe sections thereof up to 16 inches in diameter. District forces will disinfect water mains and pipe sections 16 inches in diameter and larger. The Contractor will assist District forces during the disinfection and flushing of the pipeline(s).

653.2 References:

a. ANSI/AWWA C651-99 – AWWA STANDARD FOR DISINFECTING WATER MAINS

653.3 Materials:

CALCIUM HYPOCHLORITE. Calcium hypochlorite conforming to ANSI/AWWA B300 is available in 5-gram tablets or granular form, and must contain approximately 65% available chlorine by weight. The material should be stored in a cool, dry and dark environment to minimize its deterioration. Tablets dissolve in approximately 7 hours and must be given adequate concentration time. Do NOT use calcium hypochlorite intended for swimming pool disinfection. The District shall supply the calcium hypochlorite tablets, verifying the expiration date of the tablets before using.

SODIUM HYPOCHLORITE SOLUTION. Sodium hypochlorite conforming to ANSI/AWWA B300 is available in liquid form in glass, rubber-lined or plastic containers typically ranging in size from 1 quart to 5 gallons. Sodium hypochlorite contains approximately 5% to 15% available chlorine, and the storage conditions and time must be controlled to minimize its deterioration.

653.4 Construction Methods: The sanitary handling of materials, the practices during construction, and the continual inspection of the work are the primary means for ensuring the sanitary condition of the water main. The effectiveness of disinfection depends on maintaining clean pipes and avoiding major contamination during construction activities.

The three methods of disinfecting newly constructed water mains are: the tablet method, the continuous-feed method and the slug method. Factors to consider when selecting a method should include:

- a. length and diameter of the main;
- b. type of joints present, availability of materials and equipment required for disinfection;
- c. training of the personnel who will perform the disinfection, and
- d. safety concerns.

The purpose of all three chlorination methods is to disinfect water mains, resulting in the absence of coliform bacteria as confirmed by laboratory analysis.

PREVENTATIVE AND CORRECTIVE MEASURES DURING CONSTRUCTION: Heavy particles generally harbor bacteria and prevent elevated chlorine concentrations from contacting and killing these organisms. The procedures of this specification must be observed to assure that a water main and its appurtenances have been thoroughly

cleaned for the final disinfection by chlorination. Also, any connection of a new water main to the active distribution system prior to the receipt of satisfactory physical and bacteriological sample results may constitute a cross-connection. Therefore, new water mains must be isolated until physical and bacteriological tests, at 24 and 48 hours following flushing of the water main, are satisfactorily completed and meeting District specifications.

KEEPING PIPE CLEAN AND DRY: The interiors of pipes, fittings and valves shall be protected from contamination. Pipe and appurtenances delivered for construction shall be capped or bagged to minimize the entrance of foreign material. All openings in the pipeline shall be closed with watertight plugs when pipe laying is stopped at the close of the day's work or for other reasons, such as rest breaks or meal periods. Rodent-proof plugs may be used when watertight plugs are not practicable and when thorough cleaning will be performed by flushing or other means.

Delay in placement of delivered pipe invites contamination. The more closely the rate of delivery is correlated to the rate of pipe laying, the lower risk of contamination.

JOINTS: Joints of all pipe in the trench shall be completed before work is stopped. If water accumulates in the trench, the plugs shall remain in place until the trench is dry.

SEALING MATERIALS: No contaminated material or any material capable of supporting prolific growth of microorganisms shall be used for sealing joints. Sealing material or gaskets shall be handled in a manner that avoids contamination. The lubricant used in the installation of sealing gaskets shall be suitable for use in potable water and approved by the pipe manufacturer, and not contribute odors. It shall be delivered to the job in closed containers and shall be kept clean and applied with dedicated, clean applicator brushes.

CLEANING AND SWABBING: If dirt enters the pipe, it shall be removed and the interior pipe surface swabbed with a 1% to 5% hypochlorite disinfecting solution. If in the opinion of the Engineer, the dirt remaining in the pipe will not be removed using the flushing operation, then the interior of the pipe shall be cleaned using mechanical means in conjunction with the application of a 1% hypochlorite solution. The cleaning method used shall not force mud or debris into the interior pipe-joint spaces and shall be acceptable to the Engineer.

WET TRENCH CONSTRUCTION: If it is not possible to keep the pipe and fittings dry during installation, the water that may enter the pipe-joint spaces shall contain an available chlorine concentration of approximately 25 mg/L. This may be accomplished by adding calcium hypochlorite granules or tablets to each length of the pipe before it is lowered into a wet trench or by treating the trench water with hypochlorite tablets.

FLOODING BY STORM OR ACCIDENT DURING CONSTRUCTION: If the main is flooded during construction, it shall be cleared of the floodwater by draining and flushing with potable water until the main is clean. The section exposed to the floodwater shall then be filled with chlorinated potable water that, at the end of a 24-hour holding period, will have a free chlorine residual of not less than 25 mg/L. The chlorinated water may then be drained or flushed from the main. After construction is completed, the main shall be disinfected using the continuous-feed or slug method.

PREFLUSHING OF SOURCE WATER: The source water used for disinfection and pressure testing shall be flushed prior to its use to ensure that normally occurring contaminants or debris are not introduced into the new water main pipe. The District will be responsible for operating gate valves in the street as necessary. Adequate drainage

must be provided during flushing, away from the construction area. The contractor shall be responsible for constructing temporary discharge piping and/or materials as necessary, at no additional cost to the District.

TABLET METHOD OF CHLORINATION: This method consists of placing calcium hypochlorite granules or tablets in water mains less than 16 inches in diameter as it is being installed and then filling the main with potable water when installation is complete. The tablet method gives an average chlorine dose of approximately 25 mg/L. This method may be used only if the pipes and appurtenances are kept clean and dry during construction.

During construction, 5-gram calcium hypochlorite tablets shall be placed in each section of pipe. Also, one tablet shall be placed in each hydrant, hydrant branch and other appurtenances. Table 1 shows the number of tablets required for commonly used sizes of pipes. For a more complete table, see AWWA Standard C-651. The tablets shall be attached by a food-grade adhesive; Permatex No. 2c adhesive or District approved equal. There shall be adhesive only on the broadside of the tablet attached to the surface of the pipe. Attach all tablets inside and at the top of the main, with approximately equal number of tablets at each end of a given length of pipe. If the tablets are attached before the pipe section is placed in the trench, their position shall be marked on the section to indicate that the pipe has been installed with the tablets at the top.

**Table 1
 Number of 5-gram Hypochlorite Tablets Required for Dose of 25 mg/L ***

Pipe Diameter (inch)	Length of Pipe Section	
	18-foot	20-foot
4	1	1
6	1	1
8	2	2
10	3	3
12	4	4

* Based on 3.25-gram available chlorine per tablet. Any portion of tablet rounded to the next higher integer.

When the water main installation has been completed, the pipe shall be filled with water at a rate to ensure that the water within the main will flow at a velocity no greater than 1 ft/sec. Precautions shall be taken to ensure that air pockets are eliminated. The water shall remain in the pipe for at least 24 hours. If the water temperature is less than 41oF, the water shall remain in the pipe for a minimum 48 hours. A detectable chlorine residual should be found at each sampling point after the 24-hour period; measured as a heterotrophic plate count less than 500 per milliliter at 35 oC. The results must be reported.

CONTINUOUS-FEED METHOD: The continuous-feed method consists of placing calcium hypochlorite tablets in the main during construction (optional), completely filling the main to remove all air pockets, flushing the completed main to remove particulates, and filling the main with potable water. The potable water shall be chlorinated so that after a 24-hour holding period in the main there will be a free chlorine residual of not less than 10 mg/L.

At the discretion of the Engineer, calcium hypochlorite tablets shall be placed in pipe sections as specified. The purpose of this procedure is to provide a strong chlorine

concentration in the first flow of flushing water that flows down the main. In particular, this procedure is recommended when the type of pipe is such that this first flow of water will flow into annular spaces at pipe joints.

Before the water main is chlorinated, it shall be filled to eliminate air pockets and flushed to remove particulates. The flushing velocity in the main shall not be less than 2.5 feet per second; this minimum flushing velocity is critical to the success of the disinfection process. If requested by the Engineer, the contractor shall provide documentation, including calculations as required, to prove a flushing velocity of 2.5 feet per second. Table 3 shows the rates of flow required to produce a velocity of in commonly used pipe sizes. For 24-inch or larger diameter water mains, an acceptable alternative is to broom-sweep the main, carefully removing all sweepings prior to chlorinating the main.

CHLORINATING THE WATER MAIN: Water supplied from a temporary, backflow-prevented connection to the existing distribution system shall flow at a constant, measured rate into the newly installed water main.

At a point not more than ten feet (10 ft) downstream from the beginning of the new main, water entering the new main shall receive a dose of chlorine fed at a constant rate such that the water will not have less than 25 mg/L free chlorine. To ensure that this concentration is achieved, the chlorine concentration should be measured at the time of application and at regular intervals, no more than 1,200 feet.

Table 2 gives the amount of chlorine required for each 100 feet of pipe of various diameters. Solutions of 1% chlorine may be prepared with sodium hypochlorite or calcium hypochlorite.

**Table 2
Chlorine Required to Produce 25-mg/L Concentration
in 100 feet of Pipe by Diameter**

Pipe Diameter (inch)	100% Chlorine (pound)	1% Chlorine Solution (gallon)
4	0.013	0.16
6	0.030	0.36
8	0.054	0.65
10	0.085	1.02
12	0.120	1.44
16	0.217	2.60

SLUG METHOD: The slug method consists of placing calcium hypochlorite granules in the main during construction (optional), completely filling the main to eliminate all air pockets, flushing the main to remove particulates, and slowly flowing through the main a slug of water dosed with chlorine to a concentration of 100 mg/L. The slow rate of flow ensures that all parts of the main and its appurtenances will be exposed to the highly chlorinated water for a period not less than 3 hours.

At the discretion of the Engineer, calcium hypochlorite tablets shall be placed in pipe sections as specified. The purpose of this procedure is to provide a strong chlorine concentration in the first flow of flushing water that flows down the main. In particular, this procedure is recommended when the type of pipe is such that this first flow of water will flow into annular spaces at pipe joints.

Before the water main is chlorinated, it shall be filled to eliminate air pockets and flushed to remove particulates. The flushing velocity in the main shall not be less than 2.5 feet per second. Table 3 shows the rates of flow required to produce such a velocity of 2.5 feet per second in commonly used pipe sizes. For 24-inch or larger diameter water mains, an acceptable alternative is to broom-sweep the main, carefully removing all sweepings prior to chlorinating the main.

**Table 3
Required Flow and Openings to Flush Pipelines**

Pipe Diameter (inch)	GPM Required for 2.5 ft/sec Velocity	Size of Tap (inch)			Number of 2-1/2 inch Hydrant Outlets
		1	1-1/2	2	
		Number of Taps on Pipe			
4	100	1	-	-	1
6	200	-	1	-	1
8	400	-	2	1	1
10	600	-	3	2	1
12	900	-	-	2	2
16	1,600	-	-	4	2

Chlorinating the water main.

At a point not more than ten feet (10 ft) downstream from the beginning of the new main, water entering the new main shall receive a dose of chlorine fed at a constant rate such that the water will not have less than 100 mg/L free chlorine. To ensure that this concentration is achieved, the chlorine concentration should be measured at regular intervals, no more than 1,200 feet. The chlorine shall be applied continuously and for a sufficient period to develop a solid column, or "slug" of chlorinated water that will, as it moves through the main, expose all interior surfaces to a concentration of approximately 100 mg/L for a minimum of three (3) hours.

The free chlorine residual shall be measured in the slug as it moves through the main. If at any time, the residual drops below 50 mg/L, the flow shall be stopped; chlorination equipment shall be relocated at the head of the slug; and, as flow resumes, chlorine shall be applied to restore the free chlorine in the slug to not less than 100 mg/L.

As the chlorinated water flows past fittings and valves, related valves and hydrants shall be operated so as to disinfect appurtenances and pipe branches.

FINAL FLUSHING: After the applicable retention period, heavily chlorinated water should not remain in prolonged contact with the pipe. In order to prevent damage to the pipe lining or to prevent corrosion damage to the pipe itself, the heavily chlorinated water shall be flushed from the main, fittings, valves and branches until chlorine measurements show that the concentration in the main is no higher than that generally prevailing in the distribution system.

The Contractor shall make arrangements with the District to flush the new water main following disinfection. District forces shall be responsible for operating the gate valves in the street as necessary, and to supply materials for neutralizing the chlorine. The Contractor shall be responsible for supplying equipment and appurtenances necessary to perform flushing operation, as well as determining where the water will drain during the flushing operation so as not to cause localized flooding or cause damage to property or the environment.

The environment to which the chlorinated water is to be discharged shall be inspected. If there is any possibility that the chlorinated discharge will cause damage to the environment, then a neutralizing chemical shall be applied to the water to be wasted to thoroughly neutralize the residual chlorine. Following neutralization of the chlorinated water, the level of chlorine shall be non detectable, and in no case higher than the chlorine level in the distribution system.

DISINFECTION TESTS: Following disinfection and flushing, the District forces will collect and analyze water samples from the new main utilizing a copper sterilization sampling fitting located no more than every 1,200 feet along the newly constructed water main. Two sets of water samples will be collected: the first at 24 hours following the flushing operation, and the second set of samples will be collected at 48 hours after flushing the pipeline. The results are available approximately two business days following collection. The analytical results for the samples will be compared to the maximum allowable limits for each parameter as established by the Metropolitan District. If the parameters are satisfactory for BOTH sets of water samples, then the water main is considered passing and can be opened for service.

**Table 4
Physical, Chemical and Bacteriological Parameters for Water Mains**

Parameter	Maximum Allowable Limit
pH	6.4 to 8.5
Color	15 units
Turbidity	1.0 NTU
Odor	2
Hardness	150 ppm
Specific Conductance	100 microhms at 25 °C
Coliform Bacteria	0.0 per 100 milliliters
Standard Heterotrophic Plate Count	< 500 per milliliter at 35 °C
Chlorine Residual	< 0.8 ppm
Volatile Organic Compounds	Varies depending on the specific organic

REDISINFECTION: If the initial disinfection fails to produce satisfactory physical and bacteriological results for EITHER set of water samples, the new main shall be reflushed and resampled (two sets of water samples). If the check samples also fail to produce acceptable results, the main shall be rechlorinated by the continuous feed or slug method until satisfactory results are obtained.

Note: High velocities in the system, resulting from flushing the new main, may disturb sediment that has accumulated in the existing mains. When check samples are taken, it is advisable to sample water entering the new main to determine the source of the turbidity.

653.5 Method of Measurement: The work performed under this Section of the Specifications will not be measured for payment.

The Contractor will not be charged for the District water used in this operation.

Should the water fail to pass the required physical, chemical and bacteriological parameters and it is determined that the failure was caused by the Contractor's operations, all costs for the reflushing, disinfection, retesting, etc., shall be borne by the

Contractor and any costs incurred by the District for reflushing, disinfection, retesting, etc., shall be deducted from any payments that may be due to the Contractor.

12-Inch Pipe and Smaller: In the event water has entered the pipeline during installation, thereby rendering the hypochlorite tablets ineffective, or the pipeline must be dewatered to allow for repairs due to faulty installation, the District will chlorinate the main by injecting a liquid hypochlorite solution into the pipeline. The cost for this work (labor and materials), including installation of the chlorination fittings shall be paid by deducting the costs thereof from any payment due the Contractor.

16-Inch and Larger: The District will chlorinate and disinfect the pipeline by injecting a hypochlorite solution utilizing the chlorination fitting and chlorination blow-off installed under other Items of the Work. The Contractor will not be charged for the initial chlorination by District forces. Failure to pass is indicative of a contaminated pipe. A chlorine residual of 100 ppm within the water main will be achieved by District forces as evidence of proper disinfection application. Additional disinfection costs will be charged to the contractor.

653.6

Basis of Payment: No payment will be made to the Contractor for the work performed under this Section of the Specifications, but all costs therefore shall be considered as having been included in the prices for various bid items.

The District will attempt to minimize any damage that may occur during the filling, disinfection and flushing operations; however the Contractor shall repair any such minor damage and the cost thereof will be considered as included in the price bid per linear foot of pipeline.

654.0 12-INCH AND SMALLER GATE VALVES

654.1 General: The work specified in this section includes furnishing and installing gate valves in the pipeline, together with gate valve boxes, joint restraints and extension stems, where required, over the assembly and appurtenances shown on the Contract Drawings, complete as shown, specified or directed. The work includes, all as shown, specified or directed, transporting materials, clearing, trenching, disposing of unused excavated materials, furnishing and installing the gate valve, gate box, extension stem, where required, refilling trenches, trench compaction/testing, furnishing additional material for refilling, miscellaneous grading, temporary and permanent surface restoration, shoring, bracing, pumping environmental protection, traffic control, and all incidental work, except as otherwise provided for.

654.2 Quality Assurance: All gate valves, accessories and gate boxes shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured.

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

All gate valves, accessories and gate boxes shall be subject to inspection by the Engineer after delivery to the job site and may also be subject to inspection at the foundry by a representative of the District.

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

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

- a. ANSI/AWWA C111/A21.11 - AMERICAN NATIONAL STANDARD FOR RUBBER-GASKET JOINTS FOR DUCTILE-IRON AND GRAY-IRON PRESSURE PIPE AND FITTINGS.
- b. ANSI/AWWA C500 - AMERICAN NATIONAL STANDARD FOR GATE VALVES FOR WATER AND SEWERAGE SYSTEMS.
- c. ANSI/AWWA C509 - AMERICAN NATIONAL STANDARD FOR RESILIENT - SEATED GATE VALVES FOR WATER AND SEWAGE SYSTEMS.
- d. ASTM A 36 - STANDARD SPECIFICATION FOR STRUCTURAL STEEL.
- e. ASTM A 123 - STANDARD SPECIFICATION FOR ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS.
- f. ASTM A126 - STANDARD SPECIFICATION FOR GRAY IRON CASTINGS FOR VALVES, FLANGES AND PIPE FITTINGS.
- g. DEVELOPER'S MANUAL FOR WATER MAIN DESIGN AND INSTALLATION STANDARDS, THE METROPOLITAN DISTRICT.

654.4 Submittals: Six (6) sets of the manufacturer's literature and/or shop drawings for the materials of this section shall be submitted for approval.

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

654.5

Materials:

GATE VALVE. The gate valve shall conform to ANSI/AWWA C500, ANSI/AWWA C509 and the following additional requirements:

- a. Valve shall be double disc or resilient sealed.
- b. Bolts and nuts for connecting O-ring seal plates and bonnet to body shall either be copper-silicon alloy or stainless steel.
- c. Valve shall be furnished with O-ring seals utilizing two O-rings, consistent with appropriate specifications.
- d. Valve shall have mechanical joint ends, unless otherwise specifically indicated, which shall conform to ANSI/AWWA C111/A21.11. All joint accessories shall be furnished with each valve.
- e. Direction to open (right-hand or left-hand) shall be as shown in the Developer's Manual; Open Left in Glastonbury.
- f. Operating nut shall be 2" square.

GATE VALVE BOX. The gate valve box shall conform to the following requirements:

- a. Cast iron shall conform to ASTM A48, Class 25.
- b. Top section shall be of the top flange design and shall have no bead on the bottom.
- c. The word "WATER" shall be cast with raised letters in the center of the cover.
- d. Base section shall be of the Dwyer design which centers the operating nut for positive access to the valve.
- e. For specific gate box details, see the Developer's Manual.
- f. Ten (10") Valve box to be used for 12" gate valve: Eight (8") valve box for 8" gate valve or less.

EXTENSION STEM. The extension stem shall be fabricated from steel conforming to ASTM A 36. Galvanizing shall conform to the latest edition of ASTM A 123.

For extension stem details, see the Developer's Manual.

654.6

Construction Methods:

INSPECTION BEFORE INSTALLATION. The gate valve, gate box, etc. shall be subject to a careful inspection before being installed. The valve shall be run through a full open-close cycle to insure proper operation.

INSTALLATION OF GATE VALVE, VALVE BOX EXTENSION STEM, AND JOINT RESTRAINTS. The gate valve shall be installed according to the details shown in the Developer's Manual and to the satisfaction of the Engineer. Trenching shall be in accord with the requirements of Sections 403, 404, and 405.

All debris and foreign material shall be cleared from valve openings and seats. All mechanisms shall be checked and all nuts and bolts checked for tightness.

The valve box shall be set plumb and centered directly over the operating nut of the valves. Earth fill shall be carefully tamped around the valve box to a distance of 4 feet on all sides of the box or to the undisturbed trench face, if less than 4 feet.

Where and as shown on the Contract Drawings, or ordered, a valve extension stem shall be installed. An extension stem will be ordered when the top of the valve-operating nut is more than 4.5 feet below finished grade.

Excavation, environmental protection, shoring, dewatering, and refill and traffic control and surface restoration shall conform to the requirements under other applicable Contract Sections.

654.7 Method of Measurement: The quantity of gate valves to be paid for will be the number of gate valves, complete with gate box, box joint restraints, and extension stem if required, installed as shown, specified and directed.

654.8 Basis of Payment: This work will be paid for at the Contract unit price each for "12-inch and Smaller Gate Valves" complete in place, which price shall include the cost of the material, including all 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 materials for refilling, trench compaction/testing, grading, bracing and pumping, traffic control, environmental protection.

Gate valves installed on hydrant laterals will be paid for under the Contract item Fire Hydrant Assembly.

Gate valves installed on Tapping Sleeve/Tapping Valve assemblies will be paid for under Contract bid item for "Tapping Sleeve/Tapping Gate Valve".

655.0 FIRE HYDRANT ASSEMBLY

655.1 Description: The work specified in this section includes furnishing and installing fire hydrant assemblies and appurtenances shown on the Contract Drawings, complete as shown, specified or directed. The work includes, all as shown, specified or directed, transporting materials, clearing, trenching, disposing of unused excavated materials, abandonment of existing hydrants, removal of existing hydrants and gate boxes and delivery to the District's Water Bureau Yard, and installing the fire hydrant, concrete collar, crushed stone drain pocket, fittings, pipe restraints and utility identification tape, refilling trenches, furnishing additional material for refilling, temporary and permanent paved and unpaved surface restoration and resetting miscellaneous items, miscellaneous grading, sheeting, bracing, pumping and all incidental work, except as otherwise provided for

655.2 Materials: All hydrants, gate valves and fittings shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured.

All fire hydrants, valves, joint restraints, and fittings shall be subject to inspection by the Engineer after delivery to the job site and may also be subject to inspection at the foundry by a representative of the District.

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

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

- a. ANSI/AWWA C502 AWWA STANDARD FOR DRY BARREL FIRE HYDRANTS.
- b. ANSI/AWWA C550 AWWA STANDARD FOR PROTECTIVE EPOXY INTERIOR COATINGS FOR VALVES AND HYDRANTS.
- c. DEVELOPER'S MANUAL FOR WATER MAIN DESIGN AND INSTALLATION STANDARDS, THE METROPOLITAN DISTRICT.
- d. WATER SERVICE STANDARD DETAILS MANUAL

FIRE HYDRANT: The Metropolitan District will supply a fire hydrant at no cost to the contractor if necessary. The fire hydrant is to be picked up at the District's yard at 125 Maxim Road, Hartford. The District will load the hydrant with the Contractor's assistance.

DUCTILE IRON PIPE AND FITTINGS: Refer to "Ductile Iron Pipe (Water Main)".

GATE VALVE, EXTENSION STEM AND GATE BOX: Refer to Standard Detail.

3/4" CRUSHED STONE/SPECIAL TRENCH REFILL: Refer to Standard Detail.

MISCELLANEOUS CONCRETE: Refer to Standard Detail.

HARNESSING: Refer to Standard Detail.

UTILITY IDENTIFICATION TAPE: The tape shall be 4 inches wide, designed to withstand extended underground exposure, colored blue and be durably imprinted with an appropriate warning indicating the presence of the buried pipe.

655.3 Submittals: Six (6) sets of the manufacturer's literature and/or shop drawings for the materials of this section shall be submitted for approval.

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

655.4 Construction Methods:
INSPECTION BEFORE INSTALLATION. Hydrants, gate valves, pipe, fittings, gate boxes etc. shall be subject to a careful inspection before being installed. Hydrants and valves shall be run through a full open close cycle to insure proper operation.

INSTALLATION OF HYDRANT ASSEMBLY. Fire hydrants, piping, gate valves, joint restraints, etc., shall be installed according to the details shown in the Developer's Manual and to the satisfaction of the Engineer.

All debris and foreign material shall be cleared from hydrants and valve openings and seats. All mechanisms shall be checked and all nuts and bolts checked for tightness.

The hydrant shall be set plumb. Special trench refill shall be carefully tamped around the hydrant to a distance of 4 feet on all sides of the hydrant, or to the undisturbed trench face, if less than 4 feet. Hydrants and connecting pipe shall have at least the same depth of cover as the distributing main. The hydrant shall be set upon a layer of crushed stone not less than 9 inches thick.

Not less than 12 cubic feet of broken stone shall be placed around the base of the hydrants at the location of the drain holes. Backfill around the hydrants shall be properly compacted to the grade line. Hydrants shall have the interiors cleaned of all foreign matter before installation, and shall be inspected in the open and closed positions.

The body of the hydrant shall be of sufficient length to allow the hydrant to be set at the proper elevation. Offsets shall be installed to set the hydrant to grade shall be furnished and installed at no additional cost to the District, when required for greater depths.

Ductile iron pipe and harnessing shall be installed in accord with standard details and specifications.

The utility identification tape shall be placed approximately two (2) feet above the top of the hydrant lateral pipe.

Gate valves, extension stems and gate boxes shall be installed in accord with standard details and specifications.

3/4" Crushed stone, special trench refill and concrete shall be placed in accord with standard details and specifications.

Excavation, support of excavation, dewatering, traffic control, paved and unpaved surface restoration and refill shall conform to the requirements under other applicable Contract Sections.

ABANDONMENT OF EXISTING HYDRANT. Subsequent to abandonment of any existing water main(s) by the District, each hydrant to be abandoned shall be dug up and removed from its lateral. The cover and top section of the hydrant lateral gate valve box shall also be dug up and removed. Both excavations shall be backfilled and resurfaced in accord with other applicable specifications. The abandoned hydrants shall be

transported to the District's Yard at 125 Maxim Road, Hartford. The District will off load the materials with the Contractor's assistance.

655.5

Method of Measurement: The quantity of fire hydrant assemblies to be paid for will be the number of fire hydrant assemblies, complete with gate valve and gate box, piping, harnessing, special trench refill, crushed stone and concrete, installed as shown, specified and directed.

Bank run gravel used for trench backfill or as backfill around structures or pipes will not be measured but will be considered as included in the unit price bid per fire hydrant assembly.

Utility identification tape will not be measured for payment, but will be considered as included in the price bid per fire hydrant assembly.

Temporary and permanent paved and unpaved surface restoration and resetting miscellaneous items will not be measured for payment, but will be considered as included in the price bid per fire hydrant assembly.

Support of excavation and dewatering, traffic control, will not be measured for payment, but will be considered as included in the price bid per fire hydrant assembly.

Abandoning existing hydrants will not be measured for payment, but will be considered as included in the price bid per fire hydrant assembly.

The 6" ductile iron pipe furnished and installed to connect the hydrant to the water main shall not be measured for payment but will be considered as included in the price bid per fire hydrant assembly.

The 6" gate valve for the fire assembly shall not be measured for payment but will be considered as included in the price bid for Ductile Iron Pipe (Water Main).

Restraining the joints within the fire hydrant assembly including the 6" water lateral to connect the hydrant to the main shall not be measured for payment but will be considered as included in the price bid per fire hydrant assembly.

655.6

Basis of Payment: This work will be paid for at the Contract unit price bid for each "Fire Hydrant Assembly" complete in place, which price shall include the cost of the material, including all labor and equipment to incorporate them into the work. It shall also include the abandonment of existing hydrants, clearing, trenching and disposal of excavated materials, refilling trenches, furnishing the additional materials for refilling, temporary and permanent paved and unpaved surface restoration and resetting miscellaneous items, traffic control, furnishing and placing concrete, crushed drain pocket, special trench refill, joint restraint, warning tape, fittings, grading, bracing and pumping.

No direct payment will be made for any work done or materials used in making the assembly tight.

Rock excavation, if required, will be paid for at the Contract unit price bid for "Rock Excavation," as provided for in the Proposal.

656.0 AIR VALVE ASSEMBLY

656.1 Description: The work specified in this section includes furnishing and installing air valves, chlorination valves, chlorination blow-offs and other related assemblies in the pipeline, and installing gate boxes over the assembly, as shown on the Contract Drawings or as directed by the Engineer, in accord with these specifications. Also included is the clearing, trenching and disposal of excavated materials, refilling trenches, furnishing the additional material for refilling, grading, bracing and pumping.

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

- a. ASTM B62 - STANDARD SPECIFICATION FOR COMPOSITION BRONZE OR OUNCE METAL CASTINGS
- b. ASTM B88 - STANDARD SPECIFICATION FOR SEAMLESS COPPER WATER TUBE.
- c. ASTM A126 - STANDARD SPECIFICATION FOR GRAY IRON CASTINGS FOR VALVES, FLANGES AND PIPE FITTINGS.
- d. ANSI/AWWA C800 - AWWA STANDARD FOR UNDERGROUND SERVICE LINE VALVES AND FITTINGS.
- e. DEVELOPER'S MANUAL FOR WATER MAIN DESIGN AND INSTALLATION STANDARDS, THE METROPOLITAN DISTRICT.
- f. WATER SERVICE STANDARD DETAILS MANUAL

COPPER PIPE. The copper tubing shall conform to ASTM B88, Type K.

FITTINGS. All brass fittings shall be of standard design generally used by water utilities and be in accord with ASTM B62 and ANSI/AWWA C800.

The corporation stops and angle valves shall be of good, tough, composition bronze well-mixed and free from flaws and imperfections. The corporation stops shall be of a type suitable for use in ductile iron mains. The inlet end shall have an inlet taper thread type known as the "Mueller Taper Thread".

Compression fittings, valves, etc. shall be of the design employing the pipe clamp feature.

GATE VALVE BOX. The gate valve box shall conform to the following requirements:

Cast iron shall conform to ASTM A48, Class 25.

Top section shall be of the top flange design and shall have no bead on the bottom.

The word "WATER" shall be cast with raised letters in the center of the cover.

Base section shall be of the Dwyer design which centers the operating nut for positive access to the valve.

For specific gate box details, see the Developer's Manual.

655.3 Submittals: Six (6) sets of the manufacturer's literature and/or shop drawings for the materials of this section shall be submitted for approval.

656.4 Construction Methods:

INSPECTION BEFORE INSTALLATION. All tubing and fittings shall be carefully examined for defects and no material shall be installed which is known to be defective and should any defective tubing or fitting be discovered after being installed, it shall be removed and replaced with sound material at no additional cost to the District.

INSTALLATION. The air valves, chlorination valve and blow-off shall be installed according to the details shown in the Developer's Manual and to the satisfaction of the Engineer. To properly receive the air valve or other assembly the ductile iron pipe shall be drilled and tapped. All tapped holes for corporation stops shall be tapped Mueller Thread.

All tapped holes in ductile iron pipe shall be cleaned by running the correct size tap into the hole immediately prior to installing the corporation.

Gate valve boxes shall be set plumb and centered on the fitting, etc. Earth fill shall be carefully tamped around the gate box to a distance of 4 feet on all sides of the box or to the undistributed trench face, if less than 4 feet.

Excavation and refill shall conform to the requirements under other applicable Contract Sections.

656.5 Method of Measurement: The quantity of air valve assemblies to be paid for will be the number of air valves complete with gate boxes, installed as shown, specified and directed.

656.6 Basis of Payment: This work will be paid for at the contract unit price for "Air Valve Assembly" complete in place, which price shall include the cost of transporting the material to the job site, including all 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, bracing and pumping.

669.0 BLOW-OFF ASSEMBLY

669.1 Description: The work specified in this section includes furnishing and installing blow-off assemblies of the various sizes, lengths, and configurations as shown on the Contract Drawings, complete as shown, specified or directed. The work includes, all as shown, specified or directed, transporting materials, clearing, trenching, disposing of unused or unsuitable excavated materials and installing the blow-off assembly including tee bends or other fittings, ductile iron pipe, gate valve, gate box, extension stem if required, gate box top section, special trench refill, from bottom of trench to subgrade level of finish surfacing material, crushed stone drain pocket, miscellaneous concrete, fittings, pipe restraints and utility identification tape, refilling trenches, furnishing additional material for refilling, trench compaction, miscellaneous grading, maintenance and protection of traffic, temporary and permanent paved and unpaved surface restoration and resetting miscellaneous items, environmental protection procedures, handling flushing flows of water, neutralizing hyperchlorinated water, milling pavement and overlay, sheeting, shoring, bracing, pumping, traffic control and all incidental work, except as otherwise provided for.

669.2 Quality Assurance: All blow-off assemblies including gate valves and fittings shall be inspected and tested at the foundry as required by the standard specifications to which the material is manufactured.

All blow-off assemblies including valves and fittings shall be subject to inspection by the Engineer after delivery to the job site and may also be subject to inspection at the foundry by a representative of the District.

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

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

- a. DEVELOPER'S MANUAL FOR WATER MAIN DESIGN AND INSTALLATION STANDARDS, THE METROPOLITAN DISTRICT.

669.4 Submittals: In accord with the General Conditions, six (6) sets of the manufacturer's literature and/or shop drawings for the materials of this section shall be submitted for approval.

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

669.5 Materials:
DUCTILE IRON PIPE, FITTINGS AND JOINT RESTRAINTS. Refer to Section 651.
GATE VALVE AND GATE BOX. Refer to Section 642.
HARNESSING. Refer to Section 651.

UTILITY IDENTIFICATION TAPE. Utility identification tape shall be 6-inches wide, designed to withstand extended underground exposure, colored blue and be durably imprinted with an appropriate warning indicating the presence of the buried pipe. Refer to Section 651.

669.6

Construction Methods:

INSPECTION BEFORE INSTALLATION. Blow-off assemblies including gate valves, pipe, pipe restraints, fittings, gate boxes, etc. shall be subject to a careful inspection before being installed. Valves shall be run through a full open-close cycle to insure proper operation.

INSTALLATION OF BLOW-OFF ASSEMBLIES. Blow-off assemblies including piping, pipe restraints, gate valves, fittings, etc. shall be installed according to the details shown in the Developer's Manual, to the satisfaction of the Engineer and in general, with the requirements of Section 651.

All debris and foreign material shall be cleared from valve openings. The blow-off assembly shall be set plumb. Blow-off assemblies and connecting pipe shall have at least the same depth of cover as the distributing main.

Where and if rock/ledge formations are encountered during the course of excavation for the blow-off assemble, said rock/ledge formation shall be removed in accord with the requirements of Section 103.

Special trench refill shall be placed over the pipe and fittings from the bottom of the trench to the subgrade level of the surfacing material.

Ductile iron pipe, fittings and harnessing shall be installed in accord with Section 651.

The utility identification tape shall be placed approximately two (2) feet above the top of the pipe.

Gate valves, joint restraint devices and gate boxes shall be installed in accord with Section 642 and 651.

Three-quarter inch (3/4") crushed stone, special trench refill and poured concrete shall be placed as shown on the plans.

Excavation and refill shall conform to the requirements under other applicable Contract Sections.

669.7

Method of Measurement: The quantity of blow-off assemblies to be paid for will be the number of blow-off assemblies, complete with gate valve and gate box, piping, harnessing, crushed stone, bank gravel, warning tape, concrete, temporary and permanent resurfacing/restoration, gate valve top section, extension stem, where required, and fittings, installed as shown and directed and described herein.

One (1) blow off assembly constitutes one (1) unit, regardless of size and configuration.

Sterilization Sampling Points, where indicated on the plans, shall not be measured for payment, but rather will be considered as included in the unit price bid per blow-off assembly.

The bank run gravel from the bottom of the trench to the subgrade level of the surfacing material will not be measured for payment, but will be considered as included in the unit or lump sum price bid per blow-off assembly.

Utility identification tape will not be measured for payment, but will be considered as included in the unit or lump sum price bid per blow-off assembly.

Support of excavation, dewatering and maintenance and protection of traffic, will not be measured for payment, but will be considered as included in the price bid per blow-off assembly.

Temporary and permanent paved and unpaved surface restoration, miscellaneous concrete, and resetting miscellaneous items will not be measured for payment, but will be considered as included in the price bid per blow-off assembly.

Special Trench Refill necessary for the replacement of unsuitable material will not be measured for payment.

Rock excavation, if required, will be paid for at the Contract unit price bid for "Rock Excavation," as provided for in the Proposal.

Gate valves will not be measured separately for payment, but the cost therefore shall be considered as included in the unit or lump sum price bid for Bid Item, "Various Sized Blow off Assembly".

Earth excavation, including removal and disposal of bituminous or concrete pavement, will not be measured for payment but shall be considered as included in the unit or lump sum price bid for Bid Item, "Various Sized Blow off Assembly".

669.8

Basis of Payment: This work will be paid for at the Contract unit price bid for "Various Size Blow-Off Assemblies" complete in place, which price shall include the cost of the material, including all labor and equipment to incorporate them into the work. It shall also include clearing, trenching and disposal of excavated materials, refilling trenches, special trench refill, trench compaction furnishing the additional materials for refilling, grading, and permanent paved and unpaved surface restoration and resetting miscellaneous items, bracing, pumping and traffic control.

No direct payment will be made for any work done or materials used in making the assembly tight.

Special Trench Refill for replacement of unsuitable material will not be paid for, but the cost thereof shall be considered as included in the lump sum or unit price bid for each blow off assembly.

Rock excavation, if required, will be paid for at the Contract unit price bid for "Rock Excavation," as provided for in the Proposal.

701.0 GAS MAIN INSTALLATION

701.1 General: This item includes trench excavation, installation of sand bedding, backfilling, compaction, and other work as directed by Connecticut Natural Gas (CNG) representatives and as required for installation of the proposed gas main. Installation shall be as described on the construction details included on the plans and as directed by CNG representatives. The Contractor is responsible for all work related to the gas main installation except for installation of the piping itself, which will be performed by authorized CNG personnel. The Contractor shall provide a suitable place for storage of pipe and other pipeline materials which will be provided by CNG.

Trench excavation, dewatering, and backfill 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, or as directed by CNG.

701.2 Materials:
Sand bedding shall be screened sand comparable to masons sand.

Utility warning tape shall be 4 inches wide, designed to withstand extended underground exposure, and be durably imprinted with an appropriate warning indicating the presence of the buried pipe. Warning tape color shall be as directed by CNG.

701.3 Method of Measurement: This item will be measured by the number of linear feet of gas main installed and accepted. Trench excavation, sand bedding, backfilling, compaction, utility warning tape, and removal or disposal of surplus excavated material will not be measured for payment.

701.4 Basis of Payment: This item shall be paid for at the Contract unit price per linear foot as listed in the bid proposal for Gas Main Installation. This price shall include trench excavation, sand bedding, backfilling, compaction, coordination with CNG, and all labor, equipment, materials, and work incidental thereto.

1008.0 ELECTRIC CONDUIT (DUCT BANK)

1008.1 General: This item shall conform to Section 10.08 ELECTRICAL CONDUIT, of the Form 816, amended as follows:

1008.2 Description: Replace Article 10.08.01 with the following:

This item shall consist of furnishing and installing duct banks with multiple conduits of the size and type specified with pull cords and necessary fittings, as shown on the plans, and as directed by the Engineer. Also included in this item are trench excavation and select backfill as required.

1008.3 Method of Measurement: Replace Article 10.08.04 with the following:

This item will be measured for payment by the actual number of linear feet of duct bank of the type specified, installed, and accepted. The measured length shall be from end to end along the centerline through all fittings.

1008.4 Basis of Payment: Replace Article 10.08.05 with the following:

This work will be paid for at the Contract unit price per linear feet for Duct Bank Type 1 or Duct Bank Type 2 as listed in the bid proposal. This price shall include conduits of the size, type, and number as indicated on the plans, trench excavation, select backfill, and all materials required including pull cords, expansion fittings, conduit fittings, locknuts, bonding bushings, bonding wire, hangers, clamps, duct seal, caps, inserts, equipment, tools, labor and work incidental thereto.”

Trenching and backfilling shall not be measured for payment. Rather, this cost shall be included in the unit price per foot of duct bank.

Pay Item	Pay Unit
Duct Bank Type 1	(ft)
Duct Bank Type 2	(ft)

Proposal of _____
(hereinafter called "Bidder"), organized and existing under the laws of the State of _____
_____, doing business as _____
_____.

To the Town of Glastonbury (hereinafter called "Town").

In compliance with your Invitation to Bid, the Bidder hereby proposed to furnish materials and/or services as per Bid Number GL-2010-52 in strict accordance with the Bid Documents, within the time set forth therein, and at the prices stated below.

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.

The Bidder acknowledges receipt of the following:

Addendum #1 _____

Addendum #2 _____

Addendum #3 _____

It is the responsibility of the Bidder to check the Town's website for any Addendum before submitting the bid.

**WESTERN BOULEVARD CONNECTION
 BID PROPOSAL**

BID #GL-2010-52

ITEM NO.	DESCRIPTION	QTY.	UNIT PRICE	EXTENSION
1.	Preparation of Site in accordance with Section 002.0 of the Detailed Construction Specifications	Lump Sum	\$ _____/L.S.	\$ _____
2.	Test Pits in accordance with Section 004.0 of the Detailed Construction Specifications	2 Each	\$ _____/EA.	\$ _____
3.	Rock Excavation in accordance with Section 103.0 of the Detailed Construction Specifications	20 C.Y.	\$ _____/C.Y.	\$ _____
4.	Earth Excavation in accordance with Section 106.0 of the Detailed Construction Specifications	Lump Sum	\$ _____/L.S.	\$ _____
5.	Removal of Pavement in accordance with Section 106.0 of the Detailed Construction Specifications	350 S.Y.	\$ _____/S.Y.	\$ _____
6.	Formation of Subgrade in accordance with Section 107.0 of the Detailed Construction Specifications	6,300 S.Y.	\$ _____/S.Y.	\$ _____
7.	Subbase in accordance with Section 108.0 of the Detailed Construction Specifications	2,100 C.Y.	\$ _____/C.Y.	\$ _____
8.	Processed Stone Base in accordance with Section 109.0 of the Detailed Construction Specifications	1,100 C.Y.	\$ _____/C.Y.	\$ _____
9.	Bituminous Concrete Class 1 in accordance with Section 112.0 of the Detailed Construction Specifications	905 Ton	\$ _____/Ton	\$ _____
10.	Cut Bituminous Concrete Pavement in accordance with Section 112.0 of the Detailed Construction Specifications	90 L.F.	\$ _____/L.F.	\$ _____
11.	Cleaning and Sealing Joints and Cracks in accordance with Section 112.0 of the Detailed Construction Specifications	90 L.F.	\$ _____/L.F.	\$ _____
12.	Bituminous Cape Cod Curbing in accordance with Section 113.0 of the Detailed Construction Specifications	3,400 L.F.	\$ _____/L.F.	\$ _____
13.	Concrete Sidewalks in accordance with Section 201.0 of the Detailed Construction Specifications	1,700 S.F.	\$ _____/S.F.	\$ _____

**WESTERN BOULEVARD CONNECTION
 BID PROPOSAL**

BID #GL-2010-52

ITEM NO.	DESCRIPTION	QTY.	UNIT PRICE	EXTENSION
14.	Grading and Topsoiling in accordance with Section 204.0 of the Detailed Construction Specifications	13,000 S.Y.	\$ _____/S.Y.	\$ _____
15.	Turf Establishment in accordance with Section 205.0 of the Detailed Construction Specifications	12,300 S.Y.	\$ _____/S.Y.	\$ _____
16.	Wetland Seeding in accordance with Section 205.0 of the Detailed Construction Specifications	700 S.Y.	\$ _____/S.Y.	\$ _____
17.	Erosion Control Mat (Type H) in accordance with Section 205.0 of the Detailed Construction Specifications	700 S.Y.	\$ _____/S.Y.	\$ _____
18.	Sedimentation Control System in accordance with Section 206.0 of the Detailed Construction Specifications	1,850 L.F.	\$ _____/L.F.	\$ _____
19.	Sedimentation Control Sack in accordance with Section 207.0 of the Detailed Construction Specifications	4 Each	\$ _____/EA.	\$ _____
20.	Stone Check Dam in accordance with Section 209.0 of the Detailed Construction Specifications	4 Each	\$ _____/EA.	\$ _____
21.	Temporary Construction Entrance in accordance with Section 210.0 of the Detailed Construction Specifications	Lump Sum	\$ _____/L.S.	\$ _____
22.	Temporary Water Bar with Level Spreader in accordance with Section 211.0 of the Detailed Construction Specifications	2 Each	\$ _____/EA.	\$ _____
23.	Maintenance and Protection of Traffic in accordance with Section 301.0 of the Detailed Construction Specifications	Lump Sum	\$ _____/L.S.	\$ _____
24.	Trafficperson (Uniformed Flagger) in accordance with Section 302.0 of the Detailed Construction Specifications	40 Hour	\$ _____/HR.	\$ _____
25.	Trafficperson (Police Officer) in accordance with Section 302.0 of the Detailed Construction Specifications	1 EST	\$ <u>2,000.00</u> /EST.	\$ <u>2,000.00</u>
26.	Painted Pavement Markings (4" Yellow) in accordance with Section 318.0 of the Detailed Construction Specifications	3,250 L.F.	\$ _____/L.F.	\$ _____

**WESTERN BOULEVARD CONNECTION
 BID PROPOSAL**

BID #GL-2010-52

ITEM NO.	DESCRIPTION	QTY.	UNIT PRICE	EXTENSION
27.	Painted Pavement Markings (4" White) in accordance with Section 318.0 of the Detailed Construction Specifications	3,250 L.F.	\$ _____/L.F.	\$ _____
28.	Traffic Signs in accordance with Section 320.0 of the Detailed Construction Specifications	4 Each	\$ _____/EA.	\$ _____
29.	12-inch Reinforced Concrete Pipe in accordance with Section 406.0 of the Detailed Construction Specifications	185 L.F.	\$ _____/L.F.	\$ _____
30.	15-inch Reinforced Concrete Pipe in accordance with Section 406.0 of the Detailed Construction Specifications	900 L.F.	\$ _____/L.F.	\$ _____
31.	18-inch Reinforced Concrete Pipe in accordance with Section 406.0 of the Detailed Construction Specifications	250 L.F.	\$ _____/L.F.	\$ _____
32.	24-inch Reinforced Concrete Pipe in accordance with Section 406.0 of the Detailed Construction Specifications	70 L.F.	\$ _____/L.F.	\$ _____
33.	8-inch PVC Pipe in accordance with Section 406.0 of the Detailed Construction Specifications	140 L.F.	\$ _____/L.F.	\$ _____
34.	Type 'C' Catch Basin (Cape Cod Top) in accordance with Section 407.0 of the Detailed Construction Specifications	14 Each	\$ _____/EA.	\$ _____
35.	Type 'C' Catch Basin (Cape Cod Top) with 4-Foot Sump in accordance with Section 407.0 of the Detailed Construction Specifications	4 Each	\$ _____/EA.	\$ _____
36.	Sedimentation Structure in accordance with Section 407.0 of the Detailed Construction Specifications	1 Each	\$ _____/EA.	\$ _____
37.	Dry Well in accordance with Section 408.0 of the Detailed Construction Specifications	5 Each	\$ _____/EA.	\$ _____
38.	24-inch Reinforced Concrete Culvert End in accordance with Section 409.0 of the Detailed Construction Specifications	1 Each	\$ _____/EA.	\$ _____
39.	12-inch Reinforced Concrete Culvert End in accordance with Section 409.0 of the Detailed Construction Specifications	1 Each	\$ _____/EA.	\$ _____

**WESTERN BOULEVARD CONNECTION
 BID PROPOSAL**

BID #GL-2010-52

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>QTY.</u>	<u>UNIT PRICE</u>	<u>EXTENSION</u>
40.	6-inch Underdrain in accordance with Section 410.0 of the Detailed Construction Specifications	250 L.F.	\$ _____/L.F.	\$ _____
41.	Modified Riprap in accordance with Section 420.0 of the Detailed Construction Specifications	30 S.Y.	\$ _____/S.Y.	\$ _____
42.	Stone Filter Berm in accordance with Section 422.0 of the Detailed Construction Specifications	330 L.F.	\$ _____/L.F.	\$ _____
43.	8-inch PVC Sanitary Sewer in accordance with Section 502.0 of the Detailed Construction Specifications	1,380 L.F.	\$ _____/L.F.	\$ _____
44.	6-inch PVC Sanitary Sewer Lateral in accordance with Section 506.0 of the Detailed Construction Specifications	250 L.F.	\$ _____/L.F.	\$ _____
45.	Sanitary Sewer Manhole in accordance with Section 508.0 of the Detailed Construction Specifications	9 Each	\$ _____/EA.	\$ _____
46.	12-inch Ductile Iron Pipe and Fittings in accordance with Section 651.0 of the Detailed Construction Specifications	1,550 L.F.	\$ _____/L.F.	\$ _____
47.	12-inch Gate Valve in accordance with Section 654.0 of the Detailed Construction Specifications	1 Each	\$ _____/EA.	\$ _____
48.	Fire Hydrant Assembly in accordance with Section 655.0 of the Detailed Construction Specifications	2 Each	\$ _____/EA.	\$ _____
49.	Air Valve Assembly in accordance with Section 656.0 of the Detailed Construction Specifications	1 Each	\$ _____/EA.	\$ _____
50.	4-inch Branch Blow-off Assembly in accordance with Section 669.0 of the Detailed Construction Specifications	1 Each	\$ _____/EA.	\$ _____
51.	Gas Main Installation in accordance with Section 701.0 of the Detailed Construction Specifications	1,600 L.F.	\$ _____/L.F.	\$ _____
52.	Duct Bank Type 1 in accordance with Section 1008.0 of the Detailed Construction Specifications	2,950 L.F.	\$ _____/L.F.	\$ _____

**WESTERN BOULEVARD CONNECTION
BID PROPOSAL**

BID #GL-2010-52

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>QTY.</u>	<u>UNIT PRICE</u>	<u>EXTENSION</u>
53.	Duct Bank Type 2 in accordance with Section 1008.0 of the Detailed Construction Specifications	400 L.F.	\$ _____/L.F.	\$ _____

TOTAL BID AMOUNT: \$ _____

WRITTEN BID AMOUNT: _____

**WESTERN BOULEVARD CONNECTION
BID PROPOSAL**

BID #GL-2010-52

**TOWN OF GLASTONBURY
BID / PROPOSAL**

DATE ADVERTISED

6/21/2010

GL #

2010-52

DATE / TIME DUE

**7/8/2010 at 11:00
A.M.**

NAME OF PROJECT

Western Boulevard Connection

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 ADDENDUMS POSTED PRIOR TO BID OPENING.

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 – PREVAILING WAGE RATE

Project: Construction Of New Town Roadway On Western Boulevard Connection

**Minimum Rates and Classifications
for Heavy/Highway Construction**

H 13854

**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: PW-0922

Project Town: Glastonbury

FAP Number:

State Number:

Project: Construction Of New Town Roadway On Western Boulevard Connection

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 7**

1) Boilermaker

\$33.79

34% + 8.96

1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons

\$32.43

20.54

2) Carpenters, Piledrivermen

\$29.00

17.80

2a) Diver Tenders

\$29.00

17.80

As of:

Friday, June 11, 2010

Project: Construction Of New Town Roadway On Western Boulevard Connection

3) Divers	\$37.46	17.80
4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	\$39.20	14.55
4a) Painters: Brush and Roller	\$28.17	14.55
4b) Painters: Spray Only	\$31.17	14.55
4c) Painters: Steel Only	\$30.17	14.55
4d) Painters: Blast and Spray	\$31.17	14.55
4e) Painters: Tanks, Tower and Swing	\$30.17	14.55
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)	\$35.40	19.51

As of:

Friday, June 11, 2010

Project: Construction Of New Town Roadway On Western Boulevard Connection

6) Ironworkers: (Ornamental, Reinforcing, Structural, and Precast Concrete Erection	\$32.75	25.08 + a
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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)	\$36.32	21.26
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----LABORERS---- - Last updated 5/10/10

8) Group 1: Laborer (Unskilled), Common or General, acetylene burner, concrete specialist	\$25.00	15.00
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9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen, air tool operator	\$25.25	15.00
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10) Group 3: Pipelayers (Installation of water, storm drainage or sewage lines outside of the building line with P6, P7 license)	\$25.50	15.00
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11) Group 4: Jackhammer/Pavement breaker (handheld); mason tenders (cement/concrete), catch basin builders, asphalt rakers, air track operators, block pavers and curb setters	\$25.50	15.00
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12) Group 5: Toxic waste removal (non-mechanical systems)	\$27.00	15.00
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Project: Construction Of New Town Roadway On Western Boulevard Connection

13) Group 6: Blasters \$26.75 15.00

Group 7: Asbestos Removal, non-mechanical systems (does not include leaded joint pipe) \$26.00 15.00

Group 8: Traffic control signalmen \$16.00 15.00

----LABORERS (TUNNEL CONSTRUCTION, FREE AIR). Shield Drive and Liner Plate Tunnels in Free Air.---- Last updated 5/10/10----

13a) Miners, Motormen, Mucking Machine Operators, Nozzle Men, Grout Men, Shaft & Tunnel Steel & Rodmen, Shield & Erector, Arm Operator, Cable Tenders \$29.44 15.00 + a

13b) Brakemen, Trackmen \$28.58 15.00 + a

----CLEANING, CONCRETE AND CAULKING TUNNEL----Last updated 5/10/10----

14) Concrete Workers, Form Movers, and Strippers \$28.58 15.00 + a

As of:

Friday, June 11, 2010

Project: Construction Of New Town Roadway On Western Boulevard Connection

15) Form Erectors	\$28.88	15.00 + a
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----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND
TUNNEL IN FREE AIR:----Last updated 5/10/10----

16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers	\$28.58	15.00 + a
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17) Laborers Topside, Cage Tenders, Bellman	\$28.48	15.00 + a
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18) Miners	\$29.44	15.00 + a
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----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED
AIR: ----Last updated 5/10/10----

18a) Blaster	\$35.21	15.00 + a
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19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	\$35.04	15.00 + a
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As of:

Friday, June 11, 2010

Project: Construction Of New Town Roadway On Western Boulevard Connection

20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	\$33.27	15.00 + a
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21) Mucking Machine Operator	\$35.75	15.00 + a
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----TRUCK DRIVERS----(*see note below)

Two axle trucks	\$27.88	14.53 + a
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Three axle trucks; two axle ready mix	\$27.98	14.53 + a
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Three axle ready mix	\$28.03	14.53 + a
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Four axle trucks, heavy duty trailer (up to 40 tons)	\$28.08	14.53 + a
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Four axle ready-mix	\$28.13	14.53 + a
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As of:

Friday, June 11, 2010

Project: Construction Of New Town Roadway On Western Boulevard Connection

Heavy duty trailer (40 tons and over)	\$28.33	14.53 + a
Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids)	\$28.13	14.53 + 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)	\$35.05	18.60 + a
Group 2: Cranes (100 ton rated capacity and over); Backhoe/Excavator over 2 cubic yards; Piledriver (\$3.00 premium when operator controls hammer). (Trade License Required)	\$34.73	18.60 + a
Group 3: Excavator; 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)	\$33.99	18.60 + a
Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper)	\$33.60	18.60 + a
Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Spreader; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24" Mandrell)	\$33.01	18.60 + a

Project: Construction Of New Town Roadway On Western Boulevard Connection

Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	\$33.01	18.60 + a
Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	\$32.70	18.60 + 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).	\$32.36	18.60 + a
Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine.	\$31.96	18.60 + 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).	\$31.53	18.60 + a
Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc.	\$29.49	18.60 + a
Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment.	\$29.49	18.60 + a
Group 12: Wellpoint Operator.	\$29.43	18.60 + a

Project: Construction Of New Town Roadway On Western Boulevard Connection

Group 13: Compressor Battery Operator.	\$28.85	18.60 + a
Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain).	\$27.71	18.60 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	\$27.30	18.60 + a
Group 16: Maintenance Engineer/Oiler	\$26.65	18.60 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	\$30.96	18.60 + a
Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).	\$28.54	18.60 + a

**NOTE: SEE BELOW

----LINE CONSTRUCTION----(Railroad Construction and Maintenance)----Last updated 4/17/09----

Project: Construction Of New Town Roadway On Western Boulevard Connection

20) Lineman, Cable Splicer, Dynamite Man \$35.65 10.70 + 6.25%

21) Heavy Equipment Operator \$22.09 10.70 + 6.25%

22) Equipment Operator, Tractor Trailer Driver, Material Men \$30.30 10.70 + 6.25%

23) Driver Groundmen \$26.74 10.70 + 6.25%

----LINE CONSTRUCTION----Last updated 4/17/09----

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

As of:

Friday, June 11, 2010

Project: Construction Of New Town Roadway On Western Boulevard Connection

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

Project: Construction Of New Town Roadway On Western Boulevard Connection

Welders: Rate for craft to which welding is incidental.

**Note: Hazardous waste removal work receives additional \$1.25 per hour for truck drivers.*

***Note: Hazardous waste premium \$3.00 per hour over classified rate*

- Crane with 150 ft. boom (including jib) - \$1.50 extra
- Crane with 200 ft. boom (including jib) - \$2.50 extra
- Crane with 250 ft. boom (including jib) - \$5.00 extra
- Crane with 300 ft. boom (including jib) - \$7.00 extra
- Crane with 400 ft. boom (including jib) - \$10.00 extra

All classifications that indicate a percentage of the fringe benefits must be calculated at the percentage rate times the "base hourly rate".

Apprentices duly registered under the Commissioner of Labor's regulations on "Work Training Standards for Apprenticeship and Training Programs" Section 31-51-d-1 to 12, are allowed to be paid the appropriate percentage of the prevailing journeymen hourly base and the full fringe benefit rate, providing the work site ratio shall not be less than one full-time journeyman instructing and supervising the work of each apprentice in a specific trade.

~~Connecticut General Statute Section 31-55a: Annual Adjustments to wage rates by contractors doing state work ~~

The Prevailing wage rates applicable to this project are subject to annual adjustments each July 1st for the duration of the project.

Each contractor shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.

It is the contractor's responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's website.

The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol.

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.

As of:

Friday, June 11, 2010

Project: Construction Of New Town Roadway On Western Boulevard Connection

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:

Friday, June 11, 2010

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 (including caulking),
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.

Bricklayer (Residential- Fairfield County)

- a. Paid Holiday: If an employee works on Christmas Eve until noon he shall be paid for 8 hours.

Electricians

Fairfield County: West of the Five Mile River in Norwalk

- a. \$2.00 per hour not to exceed \$14.00 per day.

Elevator Constructors: Mechanics

- a. Paid Holidays: New Year’s Day, Memorial Day, Independence Day, Labor Day, Veterans’ Day, Thanksgiving Day, Christmas Day, plus the Friday after Thanksgiving.
- b. Vacation: Employer contributes 8% of basic hourly rate for 5 years or more of service or 6% of basic hourly rate for 6 months to 5 years of service as vacation pay credit.

Glaziers

- a. Paid Holidays: Labor Day and Christmas Day.

Power Equipment Operators

(Heavy and Highway Construction & Building Construction)

- a. Paid Holidays: New Year's Day, Good Friday, Memorial day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day, provided the employee works 3 days during the week in which the holiday falls, if scheduled, and if scheduled, the working day before and the working day after the holiday. Holidays falling on Saturday may be observed on Saturday, or if the employer so elects, on the preceding Friday.

Ironworkers

- a. Paid Holiday: Labor Day provided employee has been on the payroll for the 5 consecutive work days prior to Labor Day.

Laborers (Tunnel Construction)

- a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day. No employee shall be eligible for holiday pay when he fails, without cause, to work the regular work day preceding the holiday or the regular work day following the holiday.

Roofers

- a. Paid Holidays: July 4th, Labor Day, and Christmas Day provided the employee is employed 15 days prior to the holiday.

Sprinkler Fitters

- a. Paid Holidays: Memorial Day, July 4th, Labor Day, Thanksgiving Day and Christmas Day, provided the employee has been in the employment of a contractor 20 working days prior to any such paid holiday.

Truck Drivers

(Heavy and Highway Construction & Building Construction)

- a. Paid Holidays: New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, Christmas day, and Good Friday, provided the employee has at least 31 calendar days of service and works the last scheduled day before and the first scheduled day after the holiday, unless excused.

Information Bulletin

Occupational Classifications

The Connecticut Department of Labor has the responsibility to properly determine "job classification" on prevailing wage projects covered under C.G.S. Section 31-53.

♪ 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 furniture/furniture 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 "joint work" 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, fascia, 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 this 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.

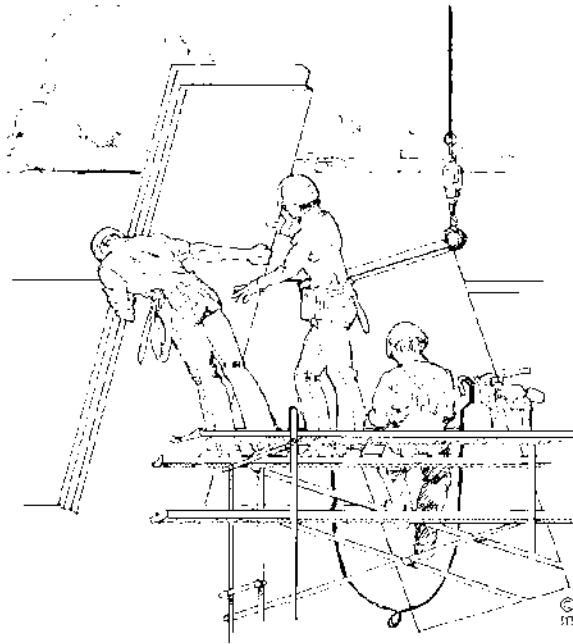
~NOTICE~

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: _____

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): _____

Certified Payroll Form WWS - CPI

Last Updated: April 22, 2010

You are here: [DOL Web Site](#) » [Wage and Workplace Standards](#) » Certified Payroll Form WWS - CPI

In accordance with [Connecticut General Statutes, 31-53](#) Certified Payrolls with a statement of compliance shall be submitted monthly to the contracting agency.

Note: Once you have downloaded these forms and are ready to print them out, set the print function on your PC to the horizontal print orientation.

Note2: Please download both the Payroll Certification for Public Works Projects **and** the Certified Statement of Compliance for a complete package. The Certified Statement of Compliance appears on the same page as the Fringe Benefits Explanation page.

Announcement: The Certified Payroll Form WWS-CPI can now be completed on-line!

- [Certified Payroll Form WWS-CPI](#) (PDF, 727KB)
- [Sample Completed Form](#) (PDF, 101KB)

Published by the Connecticut Department of Labor, Project Management Office

Informational Bulletin

THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE

(applicable to public building contracts entered into *on or after July 1, 2007*, where the total cost of all work to be performed is at least \$100,000)

- (1) This requirement was created by Public Act No. 06-175, which is codified in Section 31-53b of the Connecticut General Statutes (pertaining to the prevailing wage statutes);
- (2) The course is required for public building construction contracts (projects funded in whole or in part by the state or any political subdivision of the state) entered into on or after July 1, 2007;
- (3) It is required of private employees (not state or municipal employees) and apprentices who perform manual labor for a general contractor or subcontractor on a public building project where the total cost of all work to be performed is at least \$100,000;
- (4) The ten-hour construction course pertains to the ten-hour Outreach Course conducted in accordance with federal OSHA Training Institute standards, and, for telecommunications workers, a ten-hour training course conducted in accordance with federal OSHA standard, 29 CFR 1910.268;
- (5) The internet website for the federal OSHA Training Institute is http://www.osha.gov/fso/ote/training/edcenters/fact_sheet.html;
- (6) The statutory language leaves it to the contractor and its employees to determine who pays for the cost of the ten-hour Outreach Course;
- (7) Within 30 days of receiving a contract award, a general contractor must furnish proof to the Labor Commissioner that all employees and apprentices performing manual labor on the project will have completed such a course;
- (8) Proof of completion may be demonstrated through either: (a) the presentation of a *bona fide* student course completion card issued by the federal OSHA Training Institute; *or* (2) the presentation of documentation provided to an employee by a trainer certified by the Institute pending the actual issuance of the completion card;
- (9) Any card with an issuance date more than 5 years prior to the commencement date of the construction project shall not constitute proof of compliance;

- (10) Each employer shall affix a copy of the construction safety course completion card to the certified payroll submitted to the contracting agency in accordance with Conn. Gen. Stat. § 31-53(f) on which such employee's name first appears;
- (11) Any employee found to be in non-compliance shall be subject to removal from the worksite if such employee does not provide satisfactory proof of course completion to the Labor Commissioner by the fifteenth day after the date the employee is determined to be in noncompliance;
- (12) Any such employee who is determined to be in noncompliance may continue to work on a public building construction project for a maximum of fourteen consecutive calendar days while bringing his or her status into compliance;
- (13) The Labor Commissioner may make complaint to the prosecuting authorities regarding any employer or agent of the employer, or officer or agent of the corporation who files a false certified payroll with respect to the status of an employee who is performing manual labor on a public building construction project;
- (14) The statute provides the minimum standards required for the completion of a safety course by manual laborers on public construction contracts; any contractor can exceed these minimum requirements; and
- (15) Regulations clarifying the statute are currently in the regulatory process, and shall be posted on the CTDOL website as soon as they are adopted in final form.
- (16) Any questions regarding this statute may be directed to the Wage and Workplace Standards Division of the Connecticut Labor Department via the internet website of <http://www.ctdol.state.ct.us/wgwkstnd/wgemenu.htm>; or by telephone at (860)263-6790.

THE ABOVE INFORMATION IS PROVIDED EXCLUSIVELY AS AN EDUCATIONAL RESOURCE, AND IS NOT INTENDED AS A SUBSTITUTE FOR LEGAL INTERPRETATIONS WHICH MAY ULTIMATELY ARISE CONCERNING THE CONSTRUCTION OF THE STATUTE OR THE REGULATIONS.

Sec. 31-53b. Construction safety and health course. 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.

Statute 31-55a

Last Updated: April 22, 2010

You are here: [DOL Web Site](#) » [Wage and Workplace Standards](#) » Statute 31-55a

- Special Notice -

To All State and Political Subdivisions, Their Agents, and Contractors

Connecticut General Statute 31-55a - Annual adjustments to wage rates by contractors doing state work.

Each contractor that is awarded a contract on or after October 1, 2002, for (1) the construction of a state highway or bridge that falls under the provisions of section 31-54 of the general statutes, or (2) the construction, remodeling, refinishing, refurbishing, rehabilitation, alteration or repair of any public works project that falls under the provisions of section 31-53 of the general statutes shall contact the Labor Commissioner on or before July first of each year, for the duration of such contract, to ascertain the prevailing rate of wages on an hourly basis and the amount of payment or contributions paid or payable on behalf of each mechanic, laborer or worker employed upon the work contracted to be done, and shall make any necessary adjustments to such prevailing rate of wages and such payment or contributions paid or payable on behalf of each such employee, effective each July first.

- The prevailing wage rates applicable to any contract or subcontract awarded on or after October 1, 2002 are subject to annual adjustments each July 1st for the duration of any project which was originally advertised for bids on or after October 1, 2002.
- Each contractor affected by the above requirement shall pay the annual adjusted prevailing wage rate that is in effect each July 1st, as posted by the Department of Labor.
- It is the **contractor's** responsibility to obtain the annual adjusted prevailing wage rate increases directly from the Department of Labor's Web Site. The annual adjustments will be posted on the Department of Labor Web page: www.ctdol.state.ct.us. For those without internet access, please contact the division listed below.
- The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project. All subsequent annual adjustments will be posted on our Web Site for contractor access.

Any questions should be directed to the Contract Compliance Unit, Wage and Workplace Standards Division, Connecticut Department of Labor, 200 Folly Brook Blvd., Wethersfield, CT 06109 at (860)263-6790.

←-- [Workplace Laws](#)

Published by the Connecticut Department of Labor, Project Management Office

ATTACHMENT B – CONSTRUCTION PLANS