

**CONTRACT DOCUMENTS
FOR**

**FOSTER STREET NEIGHBORHOOD
INFRASTRUCTURE IMPROVEMENTS**

BID NO. 20/21-20



**TOWN OF MANCHESTER
GENERAL SERVICES DEPARTMENT
494 MAIN STREET
P.O. BOX 191
MANCHESTER, CT 06045-0191**

BID RESPONSE LABEL

Proposals sent by U.S. Mail should be addressed to Director of Purchasing, Town of Manchester, 494 Main Street, P.O. Box 191, Manchester, CT 06045-0191. Proposals hand delivered by Federal Express, United Parcel Service or other persons shall be delivered to Director of General Services, Town of Manchester, 494 Main Street, Manchester, CT 06040. The appropriate pre-addressed label below must be affixed to the envelope containing your proposal.

THIS LABEL FOR USE WITH UNITED STATES POSTAL SERVICE DELIVERY



BID NO. <u>20/21-20</u>	TO BE OPENED:
<u>FOSTER STREET NEIGHBORHOOD</u>	(DATE): <u>MARCH 10, 2021</u>
<u>INFRASTRUCTURE IMPROVEMENTS</u>	(TIME): <u>2:00 P.M.</u>
TO: DIRECTOR OF PURCHASING TOWN OF MANCHESTER LINCOLN CENTER 494 MAIN STREET P.O. BOX 191 MANCHESTER, CT 06045-0191	



THIS LABEL FOR USE WITH HAND DELIVERY (I.E., FED EX, UNITED PARCEL SERVICE)



BID NO. <u>20/21-20</u>	TO BE OPENED:
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TO: DIRECTOR OF PURCHASING TOWN OF MANCHESTER LINCOLN CENTER 494 MAIN STREET MANCHESTER, CT 06040	

***** IMPORTANT *****

BID PROCESS CHANGES DUE TO COVID-19

Due to the current health crisis, the Purchasing Department is changing the procedure for bid openings.

1. Bid responses will be received at the time indicated in bid documents, but due to public buildings being closed, vendors must contact the Purchasing Department at (860) 647-3031 to make an appointment to drop off their bid or send their bid by FedEx, UPS or US Postal Service to be received prior to the bid opening date and time.
2. Bid openings will be held virtually through **Go To Meeting**. Instructions for logging-in to the virtual bid opening are included below.
3. **The virtual bid opening will be held ****30 minutes**** after responses are due**, to give vendors time to log-in.
4. The virtual bid opening will be exactly the same as a regular bid opening – Purchasing staff will open the bid and read the results out loud. Results are not final until reviewed, tabulations compiled and then posted/distributed to participants. In addition, the requesting department will recommend an award after a complete review of the submissions.

We are learning more about COVID-19 every day, and our goal is to balance the health and well-being of our community with the desire to keep Town business moving forward. We will be reassessing daily and any changes will be posted on the General Services page at

<https://generalservices.townofmanchester.org/>

GO TO MEETING INFORMATION:

Bid 20/21-20 Foster St. Neighborhood Infrastructure Improvements Project
Wed, Mar 10, 2021 2:30 PM - 3:00 PM (EST)

Please join my meeting from your computer, tablet or smartphone.

<https://global.gotomeeting.com/join/626363677>

You can also dial in using your phone.

United States: [+1 \(571\) 317-3122](tel:+15713173122)

Access Code: 626-363-677

New to GoToMeeting? Get the app now and be ready when your first meeting starts:

<https://global.gotomeeting.com/install/626363677>

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SECTION 1
BIDDING REQUIREMENTS

**INVITATION TO BID
FOR
FOSTER STREET NEIGHBORHOOD INFRASTRUCTURE IMPROVEMENTS**

BID NO. 20/21-20

Work under this contract includes the replacement of approximately 3,600 linear feet of water main, 4,000 linear feet of sanitary sewer main, and reconstruction of 3,800 linear feet of roadway in the Foster Street area neighborhood in the Town of Manchester. It includes other appurtenant work such as installation of water services, fire hydrants, private sanitary sewer laterals, abandonment of existing sanitary and water utilities, minor storm drainage improvements, installation of extruded concrete curb, minor sidewalk removal, surface restoration and traffic control.

Sealed Bids will be received at the office of the Director of General Services, Lincoln Center, 494 Main Street, Manchester, Connecticut 06040 for the project “**FOSTER STREET NEIGHBORHOOD INFRASTRUCTURE IMPROVEMENTS**” until **2:00 P.M. on MARCH 10, 2021** at which time and place said bids will be opened publicly and read aloud. Bids may be hand delivered to the above address or directed by U.S. Mail to said office at Town of Manchester, Lincoln Center, 494 Main Street, P.O. Box 191, Manchester, CT 06045-0191.

The Contract Drawings and Specifications (i.e., documents) may be examined at the office of the Director of General Services, Lincoln Center, 494 Main Street, P.O. Box 191, Manchester, Connecticut 06045-0191. Paper sets of the documents can be obtained upon payment of a non-refundable fee of \$10.00/set in cash or check, made payable to the Town of Manchester. Contract documents may also be downloaded from the Town of Manchester website at <http://generalservices1.townofmanchester.org/index.cfm/bids/>.

Bid security in the form of a bid bond, payable to the Town of Manchester, is required in the sum of 5 percent (5%) of the total bid. Bid security shall be subject to the conditions set forth in the Standard Instructions to Bidders.

No bidder may withdraw his bid for a period of sixty (60) days after the date of bid opening.

The Town reserves the right to waive any informality or to reject any or all bids, should it be deemed to be in the public interest to do so, and to reserve any and/or all other rights as detailed in the Contract Documents.

The Town of Manchester is an equal opportunity employer, and requires an affirmative action policy for all of its Contractors and Vendors as a condition of doing business with the Town, as per Federal Executive Order 11246.

All bidders are requested to note that the award of this Contract is subject to the following conditions and contingencies:

1. The approval of such governmental agencies as may be required by law.
2. The appropriation of adequate funds by the proper agencies.

RULES AND REGULATIONS FOR COMPETITIVE BIDDING

These rules and regulations have been adopted by the Board of Directors of the Town of Manchester pursuant to Section 5-22 of the Town Charter. They are standard for all competitive bidding proposals issued by the Town of Manchester, Connecticut for contracts of all types where labor, materials and necessary equipment to complete work is to be furnished to the Town, where the Town is to purchase supplies, materials and equipment, where the Town is to sell surplus materials and equipment, or where the Town is to sell real estate. These rules and regulations shall be binding upon all prospective bidders and the Town of Manchester.

GENERAL RULES

1. The Director of General Services may delete or modify any of the instructions to bidders herein for a particular proposal, indicating such change in the appropriate section of the bid documents. The Director of General Services may insert special instructions in any special contracts which are subject to competitive bidding.
2. The attached proposal is signed by the bidder with full knowledge of, and agreement with, the general specifications, conditions and requirements of this bid.
3. Where appropriate, return copy of proposal on the enclosed form.
4. Submit proposal in an envelope marked with the Bidder's name and address on the upper left-hand corner.
5. Proposals sent by U.S. Mail should be addressed to Director of General Services, Town of Manchester, 494 Main Street, P.O. Box 191, Manchester, CT 06045-0191. Proposals hand delivered by Federal Express, UPS or other persons shall be delivered to Director of General Services, Town of Manchester, 494 Main Street, Manchester, CT 06040. The enclosed pre-addressed label must be affixed to the envelope containing your proposal.
6. Proposals received later than time and date specified will not be considered. Amendments to, or withdrawals of bids received later than the time and date set for bid opening will not be considered.
7. All bids shall be opened publicly and read aloud. Bidders may be present at the opening of bids. All bids shall be tabulated and copies of said tabulation shall be made available to Bidders upon their request.
8. All deliveries of commodities or services hereunder shall comply in every respect with all applicable laws of the Federal Government and/or State of Connecticut. Purchases made by the Town of Manchester are exempt from payment of Federal Excise Taxes and the Connecticut Sales Tax, and such taxes must not be included in bid prices. Federal Excise Tax exemption certificates, if requested, will be furnished.
9. The Bidder, where applicable, shall insert the price per stated unit and extend a total price for each item. In the event there is a discrepancy between the unit price and the extension, the unit price will govern.

10. Bidders shall, where applicable, submit terms for payment in spaces provided in the proposal form, showing the amount of cash discount which shall apply to bid prices when paid within the stated number of days in the proposal.
11. All inquiries shall be submitted in writing within the time limitations specified in the bid documents, and shall be directed to the General Services Office, Town of Manchester, 494 Main Street, P.O. Box 191, Manchester, CT 06045-0191, telephone 860-647-3031, fax 860-647-5206. All information given by the Town, except by written addenda, shall be informal and shall not be binding upon the Town, nor shall it furnish a basis for legal action by any Bidder or prospective Bidder against the Town.
12.
 - A. The Town reserves the right to reject any and all bids, to waive technical defects and to make such awards including accepting a bid, although not the low bid, as it deems in its sole discretion to be in the best interest of the Town. The Town reserves the right to reject any bid if the Bidder, any officer of the Bidder, or any other company owned in whole or in part by an officer(s) of the Bidder, is delinquent in the payment of any taxes or fees owed to the Town. The Town reserves the right to require a disclosure statement from the Bidder listing the name(s) of all officers of the company.
 - B. In the event the Town determines that a contractor is delinquent in any payment due the Town, then the Town may offset the delinquent amount due to the Town against the sums owed the contractor.
13. The Town of Manchester may make such investigation as deemed necessary to determine the ability of the Bidder to discharge a contract. The Bidder shall furnish the Town with all such information and data as may be required for that purpose. The Town reserves the right to reject any bid if the Bidder fails to satisfactorily convince the Town that he is properly qualified by experience and facilities to carry out the obligations of the contract and to satisfactorily complete the work called for herein, or if the bid is conditional in nature.
14. Except where otherwise provided, a contract between the Town and a successful Bidder shall consist of the Invitation to Bid, Specifications, Plans, Bid, including Proposal Sheet, and Acceptance by the Town and these Rules and Regulations. Acceptance by the Town may be by purchase order for the portion of the work awarded a contractor.
15. All Invitations to Bid shall be publicly advertised on at least three (3) occasions in a newspaper having a general circulation within the Town of Manchester, Connecticut. The last advertising date shall be at least seven (7) calendar days before the date which is advertised for the opening of bids.
16. Copies of all bid documents shall be made available to all interested persons for a fee to be determined by the Director of General Services which fee will be refundable at the discretion of the Director of General Services upon return of said documents.
17. Alternate bids shall not be accepted unless otherwise specified in the bid documents.
18. Any act or acts of misrepresentation or collusion shall be a basis for disqualification of any bid or bids submitted by such persons guilty of said misrepresentation or collusion. In the event that the

Town enters into a contract with any Bidder who is guilty of misrepresentation or collusion and such conduct is discovered after the execution of said contract, the Town may cancel said contract without incurring liability, penalty or damages.

19. In the event that any Bidder wishes to protest the potential award of a bid or any procedure or act in the advertising or soliciting of bids, said Bidder must make said protest in writing which shall state the reason therefor and request a conference with respect thereto. Said protest must be received by the Town, Office of General Services, within five (5) business days after the mailing of Bid results or decisions.
20. A conference with respect to said protest shall be scheduled by the Director of General Services forthwith and shall be attended by him or his designee, and such other persons as the Director of General Services and the General Manager shall be required to attend. The subject matter of said conference shall be limited to the reasons for the protest specified in the written request for said conference. Said conference shall also include a discussion of all possibilities for a resolution of a dispute. The Town shall make a decision in writing within three (3) business days after said conference and forward the same to the protesting Bidder forthwith.
21. In the event that any protesting Bidder wishes to take legal action against the Town, he must first fully comply with all of these Rules and Regulations, including those which have been charged by the Director of General Services pursuant to paragraph 1 herein.
22. Except for special instructions inserted in special contracts by the Director of General Services pursuant to paragraph 1 herein, in the event of any conflicts between these Rules and Regulations and the terms and conditions of any bid document, these Rules and Regulations shall prevail.
23. All awards of Bids shall be made by the Director of General Services.
24. These Rules and Regulations, as revised, shall be effective as of June 23, 1993.

Revised:

April 14, 1981

March 13, 1984

August 1, 1989

June 23, 1993

STANDARD INSTRUCTIONS TO BIDDERS - CONSTRUCTION CONTRACTS

These instructions are standard for all proposals issued by the Town of Manchester, Connecticut, for construction contracts of all types where a contractor is to furnish labor, materials and necessary equipment to complete work as outlined in the Contract Drawings and Specifications. The Town of Manchester may add to, delete, supersede or modify any of the instructions herein for a particular contract by indicating such changes in the section entitled "Special Instructions to Bidders."

1. Deposit on Contract and Drawings

A non-refundable fee of \$10.00 in cash or check payable to the Town of Manchester, Connecticut, shall be required on each paper set of Contract Drawings and Specifications taken.

2. Preparation of Bid

Each bid must be submitted on the Form of General Bid. All blank spaces for bid prices must be filled in, in ink or typewritten, in both words and figures. The bid must be submitted in a sealed envelope with the Bidder's name and address on the upper left-hand corner. Proposals sent by U.S. Mail should be addressed to Director of General Services, Town of Manchester, 494 Main Street, P.O. Box 191, Manchester, CT 06045-0191. Proposals hand delivered by Federal Express, UPS or other persons shall be delivered to Director of General Services, Town of Manchester, 494 Main Street, Manchester, CT 06040. The enclosed pre-addressed label must be affixed to the envelope containing your proposal.

3. Conditions of Work

Each bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his obligation to furnish all material, equipment, tools, labor and incidentals necessary to carry out the provisions of this Contract. Insofar as possible the Contractor, in carrying out his Work, must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor.

4. Information Not Guaranteed

All information given in the Contract Drawings and Specifications, or in the other documents relating to subsurface and other conditions, natural phenomena, existing pipes, and other structures are from the best sources at present available to the Town. All such information is furnished only for the information and convenience of bidders and is not guaranteed.

It is agreed and understood that the Town does not warrant or guarantee that the subsurface or other conditions, natural phenomena, existing pipes, or other structures encountered during construction will be the same as those indicated in the Contract Drawings and Specifications or in the other documents. It is further agreed and understood that no bidder or contractor shall use or be entitled to use any of the information made available to him, or obtained in any examination made by him, in any manner as a basis of or ground for any claim or demand against the Town, arising from or by reason of any variance which may exist between the information

made available and the actual subsurface or other conditions, natural phenomena, existing pipes or other structures actually encountered during the construction work, except as may otherwise be expressly provided for in the Contract Documents.

5. Laws and Regulations

The bidder's attention is directed to the fact that all applicable Federal and State laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the Contract throughout, and they will be deemed to be included in the Contract the same as though herein written out in full.

6. Obligation of Bidder

At the time of the opening of bids, each bidder will be presumed to have inspected the site and to have read and to be thoroughly familiar with the Contract Drawings and Specifications (including all addenda). The failure or omission of any bidder to examine any form, instrument, or document shall, in no way, relieve any bidder from any obligation in respect to his bid.

7. Wage Rates

Enclosed in this contract document is the schedule of prevailing wage rate determinations for classifications of laborers, mechanics or workers who are performing work on this project pursuant to Section 31-53, as amended of the Connecticut General Statutes. "The wages paid on an hourly basis to any mechanic, laborer or workman employed upon the work herein contracted to be done and the amount of payment or contribution paid or payable on behalf of each such employee to any employee welfare fund, as defined in subsection (h) of this section, shall be at a rate equal to the rate customary or prevailing for the same work in the same trade or occupation in the town in which such public works project is being constructed. Any contractor who is not obligated by agreement to make payment or contribution on behalf of such employees to any such employee welfare fund shall pay to each employee as part of his wages the amount of payment or contribution for his classification on each pay day".

The enclosed rates and footnotes are the minimum rates to be paid to workers in these classifications. These rates are subject to an annual adjustment each July 1st as required by Section 31-55a of the Connecticut General Statutes. It is the contractor's responsibility to obtain the annual adjusted prevailing wage increases directly from the Department of Labor's web page at www.ct.gov/dol or by contacting the Connecticut Department of Labor Unit Wage and Workplace Standards Division at 860-263-6790.

Upon award of any contract subject to the provisions of this section, the Contractor to whom such contract is awarded shall certify, under oath to the Labor Commissioner, the pay scale to be used by such Contractor and any of his subcontractors for work to be performed under such contract. Additionally, each employer subject to the prevailing wage law must file certified payrolls with the contracting agent including information, including but not limited to, employee names; occupations; hours worked; rates paid; and the employers compliance with various provisions of law.

8. Addenda and Interpretations

No interpretation of the meaning of the Contract Drawings and Specifications or other pre-bid documents will be made to any bidder orally. All information given to bidders other than by means of the Contract Drawings and Specifications, or by addenda, as described below, is given informally and shall not be used as the basis of a claim against the Town.

Every request for such interpretation should be addressed to the General Services Office by fax (860) 647-5206 or email gensvcs@manchesterct.gov at least seven (7) days prior to the date fixed for the opening of bids Any and all such interpretations and any supplemental instructions will be in the form of written addenda. For bidders who have purchased paper sets of contract documents from the General Services Department, addenda will be by sent by email, facsimile transmission (FAX), or by first class mail, at the respective email, fax numbers and addresses furnished for such purposes. The addenda will also be posted on the Town's website under the "Bid Requests" link. **For bidders who download the contract documents or obtain the documents from a source other than the General Services Department, it shall be the bidder's responsibility to check the General Services website and obtain all addenda prior to submitting a bid.**

No addendum will be issued less than three (3) days prior to the date fixed for the opening of bids. Bidders shall acknowledge receipt of the addendum by faxing back acknowledgement to the Town of Manchester at 860-647-5206 or email gensvcs@manchesterct.gov. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the Contract Documents.

9. Bid Security

Each bid must be accompanied by a bid bond or bank check, payable to the Town of Manchester for five percent (5%) of the total bid. In the event of a base bid/alternate bid situation, the bid bond will be for five percent (5%) of the base bid. The bond must be furnished by a surety company satisfactory to the Town and must be a corporate surety licensed to sign surety bonds in the State of Connecticut. The Town of Manchester will not be liable for the accrual of any interest on any certified check submitted. Cashiers' checks made payable to the Town of Manchester will be accepted.

10. Security for Faithful Performance

Simultaneously with his delivery of the executed Contract, the Contractor shall furnish a surety bond or bonds as security for faithful performance of this Contract and for the payment of all persons performing labor and materials under this Contract. The Performance Bond and the Labor and Materials Bond shall be equal to one hundred percent (100%) of the contract price and shall be furnished within ten (10) business days of the Notice of Award or prior to the start of Work, whichever comes first. The surety on such bond or bonds shall be a duly authorized surety company qualified to do business under the laws of the State of Connecticut and satisfactory to the Town.

11. Power of Attorney

Attorneys-in-fact who sign contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

12. Comparison of Bids

Bids will be compared on the basis of the quantities and unit prices stated in the Form of General Bid.

In the event that there is a discrepancy in the Form of General Bid between the unit prices and the extended amount, the unit prices shall govern and the extended amount will be corrected.

The Town agrees to examine and consider each Form of General Bid submitted in consideration of the bidder's agreements, as herein-above set forth and as set forth in the Form of General Bid.

13. Right To Reject Bid

The Town may consider informal any bid not prepared and submitted in accordance with the provisions hereof, and may waive any informalities or reject any and all bids, should the Town deem it to be in the public interest to do so.

The Town may also reject bids, which in its sole judgment, are either incomplete, conditional, obscure or not responsive, or which contain additions not called for, erasures not properly initialed, alterations, or similar irregularities, or the Town may waive such omissions, conditions or irregularities.

The Town reserves the right to reject all or any part of an unbalanced bid, to eliminate any item or part of an item or increase or decrease quantities as it deems to be in its best interest or may be necessary due to budgetary limitations.

14. Qualifications of Bidder

The Town may make such investigations as it deems necessary to determine the ability of the Bidder to perform the Work, and the Bidder shall furnish to the Town all such information and data for this purpose as the Town may request. The Town reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Town that such bidder is properly qualified to carry out the obligations of the Contract and to complete the Work contemplated therein, by the date indicated therein for completion. Conditional bids will not be accepted.

15. Ability and Experience of Bidder

No award will be made to any bidder who cannot satisfy the Town that he has sufficient ability and experience in this class of Work and sufficient capital and plant to enable him to prosecute and complete the Work successfully within the time named. The Town's decision or judgment on these matters shall be final, conclusive, and binding. The Town may make such investigations as it deems necessary, and the Bidder shall furnish to the Town, under oath if so

required, all such information and data for this purpose as the Town may request.

The following objective criteria will be used for evaluating the qualifications of bidders:

The Bidder shall:

- a) Have on its payroll or must be able to prove that it customarily employs supervisory personnel of the type qualified to perform the kind of work called for in the bid specifications.
- b) Must show or be able to demonstrate (if requested) to the satisfaction of the awarding authority that it possesses the ability and capacity to successfully complete the project through the satisfactory past performance of work of a similar size, scope and comparable dollar value to that of the subject project. The bidder shall have maintained the level of performances on such similar work continuously during the past three years and if the bidder does not have such three years as called for, then it must include in the Bidders Qualifications all acts which demonstrate the bidder's ability and capacity to perform the work.
- c) Own or possess rented or leased equipment of the type customarily required by contractors in the performance of contract work and that such equipment, if needed, is available for the job bid on.
- d) Have purchased materials over the past three years from suppliers who customarily sell same in quantity to contractors.
- e) Be financially responsible to perform the work bid on.
- f) Be able to furnish references from architects, engineers or owners indicating that it has satisfactorily completed contract work of the nature bid on and in a timely manner, complete with exoneration evidence delays were evident.
- g) Have adequate physical facilities in which and from which the work can be performed.
- h) Have a record of harmonious relationships with subcontractors on prior State and/or Municipal projects or other projects where the bidder may be requested to demonstrate such harmonious relationships to the satisfaction of the awarding authority. Prompt payment to subcontractors is one factor to be considered by the awarding authority.
- i) Have had a good track record of past performance on State and/or Municipal projects as concerns the quantity, timeliness, costs, cooperation and harmonious working relationship.
- j) Not have been cited for three or more willful or serious violations of an OSHA or of any standard, order or regulations promulgated pursuant to such Act, during the three-year period preceding the bid, which violations were cited in accordance with the provisions of any State Occupational Safety and Health Act or the Occupational Safety and Health Act of 1970 and which were not abated within the time fixed by the citation; which citation has not been set aside following appeal to the appropriate agency or court having jurisdiction.

- k) Not have received any criminal convictions related to the injury or death of any employee in the three-year period preceding the bid.

16. Equal Opportunity

The Town of Manchester is an equal opportunity employer, and requires an affirmative action policy for all of its contractors and vendors as a condition of doing business with the Town, as per Federal Executive Order 11246. By signing the Form of General Bid, all vendors and contractors agree to this condition of doing business with the Town and, should the Town choose to audit their compliance, the vendor agrees to cooperate fully.

17. Generic Term - AA-EEO

The Town is an Affirmative Action - Equal Opportunity Employer. The use of the term "he" referring to Contractor is for convenience only and shall be deemed to include, when used in this document, women-business enterprises, (WBE), corporations, partnerships and sole proprietorships.

18. Non Resident Contractor Bonds and Deposits

In accordance with Connecticut Statutes Section §12-430(7)c, the Town is required to report names of nonresident (out of state) Contractors to the State of Connecticut, Department of Revenue Services (DRS) to ensure that all applicable business taxes are being paid by Contractors. **Upon award of contract in excess of \$250,000, all nonresident contractors must furnish proof to the Town that they have obtained current status as a “verified contractor” with DRS.**

An “unverified Contractor” with DRS must file a surety bond with DRS in an amount equal to 5% of the contract price. DRS has issued **form AU-964**, Surety Bond and Release, which must be used to post that bond.

Upon submission of the bond to DRS, the Contractor must promptly furnish to the Town a copy of the **Certificate of Compliance** issued by the DRS. If the non-resident contractor fails to submit the bond to DRS and to provide to the Town a **Certificate of Compliance**, the Town is required to withhold 5% of the total contract value and deposit it with DRS.

If you have any questions regarding these requirements, contact the State Department of Revenue Services at telephone number (860) 541-7538 or visit their website at www.ct.gov/drs to obtain necessary publications, forms or information.

SPECIAL INSTRUCTIONS TO BIDDERS

These special instructions are supplemental to the section entitled "Standard Instructions to Bidders-Construction Contracts" and are applicable for this particular construction contract only.

1. Receipt and Opening of Bids

The Town of Manchester, Connecticut, herein called the Town, acting by and through its General Manager will receive sealed Bids for the project "**FOSTER STREET NEIGHBORHOOD INFRASTRUCTURE IMPROVEMENTS**". Bids by U.S. Mail shall be directed to the office of Director of General Services, Lincoln Center, 494 Main Street, P.O. Box 191, Manchester, CT 06045-0191. Bids will be received at the office of the Director of General Services, Lincoln Center, 494 Main Street, Manchester, Connecticut 06040, **until 2:00 P.M. on MARCH 10, 2021** at which time and place said bids will be publicly opened and read aloud.

Bids may be submitted 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.

2. Time for Completion - Liquidated Damages

The Bidder is made aware that the Notice to Proceed will be issued within **TEN (10) CALENDAR DAYS** after award of the Contract. The Bidder hereby agrees to commence Work under this Contract immediately after receiving written Notice to Proceed from the Town, and to complete all work within **ONE HUNDRED AND FIFTY (150) WORKING DAYS** thereafter, excluding the winter shutdown period between November 15th and April 1st (refer to associated Appendix with the Construction Workday Calendar for additional information).

The Bidder further agrees to pay as liquidated damages, the sum of **FIVE HUNDRED DOLLARS (\$500.00)** for each consecutive calendar day beyond the date of completion. Liquidated damages are not intended as a penalty but rather shall be construed as a best estimate of damages which the Town will suffer due to a Bidder's refusal, failure or neglect to perform pursuant to his Bid and Contract Documents, if his Bid is accepted by the Town.

STANDARD INSURANCE AND INDEMNIFICATION REQUIREMENTS FOR BIDS, PERMITS AND THE USE OF TOWN FACILITIES

I. GENERAL CONDITIONS:

Within ten (10) business days of the award or notice, or prior to the start of work, whichever comes first, the contractor/insured will provide, pay for, and maintain in full force and affect the insurance outlined here for coverage's at not less than the prescribed minimum limits of liability. Such coverage is to remain in force during the life of the contract and for such additional time as may be required, and will cover the contractor/insured's activities, those of any and all subcontractors, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. Any failure to comply with reporting requirements and provisions of the policies shall not affect coverage provided to Town, its officers, officials, agents or employees.

- A. Certificates of Insurance: The contractor/insured will give the owner a certificate of insurance completed by a duly authorized representative of their insurer certifying that at least the minimum coverage's required here are in effect and specifying that the liability coverage's are written on an occurrence form and that the coverage's will not be canceled, non-renewed, or materially changed by endorsement or through issuance of other policy(ies) of insurance without sixty (60) days advance written notice to the General Services Department. Failure of the owner to demand such certificate or other evidence of full compliance with these insurance requirements or failure of the owner to identify a deficiency from evidence provided will not be construed as a waiver of the contractor/insured's obligation to maintain such insurance. Any failure to comply with reporting requirements and provisions of the policies shall not affect coverage provided to Town, its officers, officials, agents or employees.
- B. Insurer Qualification: All insurance will be provided through companies authorized to do business in the State of Connecticut and considered acceptable by the owner.
- C. Additional Insured: The policy or policies providing insurance as required, with the exception of professional liability and workers' compensation, will defend and include the owner and owner's architects, directors, officers, representatives, agents, and employees as additional insureds on a primary and noncontributory basis for work performed under or incidental to this contract.
- D. Retroactive Date and Extended Reporting Period: Coverage, whether written on a claims made or occurrence basis, shall be maintained without interruption from the date of commencement of the Work until date of final payment and then extended for an additional three (3) years from date of final payment.

If any insurance required here is to be issued or renewed on a Claims Made form as opposed to an Occurrence form, the retroactive Date for coverage will be no later than the commencement date of the project. The Claims Made form will have an Extended Reporting Period of three years from the date of project completion. All Claims made policies cancelled or non-renewed and not replaced by a subsequent claims made policy will have an Extended Reporting period of three years from the date of cancellation or non-renewal.

- E. Subcontractors' Insurance: The contractor/insured will require each subcontractor hired by and/or employed by contractor/insured to purchase and maintain insurance of the types specified below. When requested by the owner, the contractor/insured will furnish copies of certificates of insurance evidencing coverage for each subcontractor.
- F. Waiver of Subrogation: The contractor/subcontractor will purchase required insurance policies that shall be endorsed with a waiver of subrogation and all rights of recovery in favor of the Town, its officers, officials, agents and employees. The contractor/insured will require of subcontractors, by appropriate written agreements, similar waivers each in favor of all parties enumerated in this section.

G. Hold Harmless: The contractor/insured shall defend, indemnify and hold harmless the owner, officers, officials, agents and employees, and if applicable, the engineer and their agents and employees from and against all claims, damages, losses and expenses, including attorney’s fees of counsel selected by the owner, arising out of or resulting from the performance of the work and /or the supplying of materials, provided that any such claim, damage, loss or expense (a) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom, and (b) is caused in whole or in part by any negligent act or omission of the contractor/insured, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not they are caused in part by a party indemnified hereunder.

II. INSURANCE LIMITS AND COVERAGE:

- A. To the extent applicable, the amounts and types of insurance will conform to the minimum terms, conditions and coverage’s of Insurance Services Office (ISO) policies, forms, and endorsements.
- B. If the contractor/insured has self-insured retention’s or deductibles under any of the following minimum required coverage’s, the contractor/insured must identify on the certificate of insurance the nature and amount of such self-insured retention’s or deductibles and provide satisfactory evidence of financial responsibility for such obligations. All self-insured retention’s or deductibles will be the contractor/insured’s sole responsibility.
- C. Workers’ Compensation Insurance: With respect to all operations the Contractor performs and all those performed for it by subcontractors, the Contractor shall carry, and require each subcontractor to carry, Workers’ Compensation insurance as required by the laws of the State of Connecticut.

Employer’s Liability insurance shall be provided in amounts not less than:

- \$500,000 per accident for bodily injury by accident;
- \$500,000 policy limit by disease; and
- \$500,000 per employee for bodily injury by disease

D. Commercial General Liability Insurance: With respect to the operations the Contractor performs and also those performed for it by subcontractors, the Contractor shall carry, and require each subcontractor to carry, Commercial General Liability insurance, including Contractual Liability, Products and Completed Operations, Broad Form Property Damage and Independent Contractors. See chart below for applicable minimum coverage amounts.

Contract Amount (\$)	Minimum Single Occurrence Amount (\$)	Minimum Annual Aggregate Amount (\$)
0 - 2,000,000	1,000,000	2,000,000
2,000,001 - 10,000,000	2,000,000	4,000,000
> 10,000,000	4,000,000	8,000,000

Notes:

- If underground work is to be undertaken, each policy shall have coverage for and exclusions removed for “Explosion, Collapse and Underground” (“XCU”).
- Should blasting be required, all necessary permits for the use of explosives shall be obtained by the contractor/insured or insured from the Fire Marshall.

E. Automobile Liability Insurance: The Contractor shall obtain automobile liability insurance covering the operation of all motor vehicles, including those hired or borrowed, that are used in connection with the Project for all damages arising out of bodily injury to or death of all persons and/or injury to or destruction of property; in any one accident or occurrence. This policy shall not be subject to an annual aggregate limitation. See chart above for applicable minimum coverage amounts.

- F. Owner’s and Contractor’s Protective Liability Insurance for and in the Name of the Town and/or State: With respect to the Contractor’s Project operations and also those of its subcontractors, the Contractor shall carry, for and on behalf of the Town and/or State for each accident or occurrence resulting in damages from bodily injury to or death of persons and/or injury to or destruction of property. See chart below for applicable minimum coverage amounts.

Contract Amount (\$)	Minimum Single Occurrence Amount (\$)	Minimum Annual Aggregate Amount (\$)
0 – 20,000,000	1,000,000	2,000,000
20,000,001 – 50,000,000	2,000,000	4,000,000
> 50,000,000	4,000,000	8,000,000

- G. Umbrella/Excess Liability: Depending on the scope and size of the product or services being provided, the Town of Manchester may require coverage applying over the underlying Commercial General Liability, Automobile Liability, Pollution Liability (where applicable), and Employer Liability section of the Workers Compensation coverage. The Town shall accept limits of coverage above the requirements, and those limits would be available for claims arising out of the negligence of the contractor/bidder. **The Town shall have the sole discretion in adding, increasing or reducing the Umbrella/Excess Liability coverage requirements.**

Minimum Limits: \$1,000,000 per occurrence/\$1,000,000 annual aggregate.

BID FORMS

All of the following documents contained within this section must be completed by the prospective bidder and returned with the bid.

- Form of General Bid (Page BR-15)
- Bid Proposal Sheets (Pages BR-16 to BR-21)
- Qualifications of Bidder Form (Pages BR-22 to BR-26)
- Bid Bond (To be supplied by Bidder)

FORM OF GENERAL BID

BID NO. 20/21-20

Town of Manchester
Director of General Services
Lincoln Center
494 Main Street
P.O. Box 191
Manchester, CT 06045-0191

Attn. Maureen Goulet, Director of General Services

Having carefully examined the Invitation to Bid, Rules and Regulations for Competitive Bidding, Standard Instructions to Bidders, Special Instructions to Bidders, Insurance and Indemnification Requirements, Form of General Bid, General Conditions, Special Provisions, Technical Specifications, Appendices, Contract Drawings and Exhibits for the furnishing of all materials, equipment, tools, labor and incidentals necessary to complete the Work known as “**FOSTER STREET NEIGHBORHOOD INFRASTRUCTURE IMPROVEMENTS**”, as well as having carefully examined the site and having satisfied himself as to conditions affecting the proposed Work and all Addenda issued by the Town prior to the date of opening of Bids, the undersigned proposes to complete all Work on the Contract Drawings and as described in the Contract Specifications, for the lump sum and unit prices for the Work, in place, for the following items and quantities.

Bidder acknowledges receipt of the following addenda:

No. _____, dated _____, 20__

No. _____, dated _____, 20__

No. _____, dated _____, 20__

No. _____, dated _____, 20__

Contractor Name (Printed)

**TOWN OF MANCHESTER BID PROPOSAL SHEET
FOSTER STREET NEIGHBORHOOD INFRASTRUCTURE IMPROVEMENTS
BID NO. 20/21-20**

Bidders must fill in “Bid Unit Price” and “Extended Amount” for each bid item. Extend all prices to two decimals.

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	BID UNIT PRICE	EXTENDED AMOUNT
1	CLEARING AND GRUBBING	LS	1	\$	\$
2	EARTH EXCAVATION	CY	1,900	\$	\$
3	ROCK IN TRENCH EXCAVATION	CY	180*	\$	\$
4	TEST PIT EXCAVATION	CY	70*	\$	\$
5	GRANULAR FILL	CY	90*	\$	\$
6	PROCESSED AGGREGATE BASE	CY	230	\$	\$
7	FORMATION OF SUBGRADE	SY	10,600	\$	\$
8	CUT BITUMINOUS CONCRETE PAVEMENT	LF	200	\$	\$
9	HMA S0.5	TON	900	\$	\$
10	HMA S1.0	TON	1,800	\$	\$
11	PERMANENT PAVEMENT REPAIR – STATE ARTERIAL (U.S. 6/44 E CENTER ST)	SY	420	\$	\$
12	PERMANENT PAVEMENT REPAIR – TOWN ARTERIAL (RTE 83 MAIN ST)	SY	35	\$	\$
13	PERMANENT PAVEMENT REPAIR – TOWN LOCAL ROAD (FORD ST)	SY	15	\$	\$
14	TEMPORARY PAVEMENT REPAIR – STATE ARTERIAL (U.S. 6/44 E CENTER ST)	SY	400	\$	\$
15	TEMPORARY PAVEMENT REPAIR – TOWN ARTERIAL (83 MAIN ST)	SY	30	\$	\$
16	TEMPORARY PAVEMENT REPAIR – TOWN COLLECTOR (SPRUCE ST)	SY	275	\$	\$
17	TEMPORARY PAVEMENT REPAIR – TOWN LOCAL ROAD (ALL OTHER RECONSTRUCTION AREAS)	SY	3,900	\$	\$
18	BITUMINOUS CONCRETE DRIVEWAY	SY	600	\$	\$
19	BITUMINOUS CONCRETE SIDEWALK	SY	40*	\$	\$
20	4” CONCRETE SIDEWALK	SF	725	\$	\$

* Indeterminate quantity for bidding purposes only

**TOWN OF MANCHESTER BID PROPOSAL SHEET
FOSTER STREET NEIGHBORHOOD INFRASTRUCTURE IMPROVEMENTS
BID NO. 20/21-20**

Bidders must fill in “Bid Unit Price” and “Extended Amount” for each bid item. Extend all prices to two decimals.

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	BID UNIT PRICE	EXTENDED AMOUNT
21	5” CONCRETE SIDEWALK	SF	2,000	\$	\$
22	REMOVE CONCRETE SIDEWALK	SY	60	\$	\$
23	6” CONCRETE DRIVEWAY APRON	SF	300	\$	\$
24	8” CONCRETE DRIVEWAY APRON (RTE 83 MAIN ST & RTE 6/44 EAST CENTER ST)	SF	250	\$	\$
25	4” EXTRUDED CONCRETE CURB	LF	1,770	\$	\$
26	MOUNTABLE EXTRUDED CONCRETE CURB	LF	100	\$	\$
27	BITUMINOUS CONCRETE LIP CURB	LF	250	\$	\$
28	GRANITE STONE CURB	LF	50*	\$	\$
29	RESET GRANITE STONE CURB	LF	400*	\$	\$
30	CUT CONCRETE PAVEMENT	LF	2,100	\$	\$
31	REMOVE CONCRETE ROAD BASE	SY	1,100	\$	\$
32	MISCELLANEOUS CONCRETE	CY	30	\$	\$
33	15” R.C.P.	LF	140	\$	\$
34	15” R.C.P. (CLASS V)	LF	210	\$	\$
35	TYPE “C-L” DOUBLE GRATE TYPE II CATCH BASIN	EA	1	\$	\$
36	TYPE “C” DOUBLE GRATE TYPE I 3-SIDED CATCH BASIN	EA	1	\$	\$
37	TYPE “C” CATCH BASIN WITH CONCRETE CURB INLET (4” REVEAL)	EA	3	\$	\$
38	TYPE “C-L” CATCH BASIN	EA	1	\$	\$
39	STORM MANHOLE	EA	1	\$	\$
40	15” REINFORCED CONCRETE CULVERT END	EA	1	\$	\$
41	REMOVE PIPE	LF	45	\$	\$
42	REMOVE DRAINAGE STRUCTURE	EA	2	\$	\$

* Indeterminate quantity for bidding purposes only

**TOWN OF MANCHESTER BID PROPOSAL SHEET
FOSTER STREET NEIGHBORHOOD INFRASTRUCTURE IMPROVEMENTS
BID NO. 20/21-20**

Bidders must fill in “Bid Unit Price” and “Extended Amount” for each bid item. Extend all prices to two decimals.

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	BID UNIT PRICE	EXTENDED AMOUNT
43	8” PVC SANITARY SEWER (0’ – 10’)	LF	3,950	\$	\$
44	8” PVC SANITARY SEWER (10’ – 15’)	LF	100	\$	\$
45	6” PVC SANITARY SEWER LATERAL	LF	2,020	\$	\$
46	6” PVC CLEANOUT	EA	20	\$	\$
47	48” SANITARY MANHOLE (0’ – 10’ DEEP)	EA	17	\$	\$
48	48 SANITARY MANHOLE (10’ – 15’ DEEP)	EA	1	\$	\$
49	ABANDON SANITARY MANHOLE	EA	5*	\$	\$
50	PRECAST CONCRETE SEWER CHIMNEY	VLF	30*	\$	\$
51	PLUG PIPE	EA	35*	\$	\$
52	ABANDON PIPE WITH FLOWABLE FILL	LF	1,000*	\$	\$
53	INTERIOR SANITARY SEWER PIPING	LF	80	\$	\$
54	1” COPPER SERVICE	EA	60	\$	\$
55	1” COPPER SERVICE TO BUILDING/REPLUMB METER	EA	10*	\$	\$
56	RECONNECT COPPER SERVICE	EA	7	\$	\$
57	REPLACE CENTER NUT CURB BOX	EA	10*	\$	\$
58	4” DUCTILE IRON PIPE	LF	100	\$	\$
59	8” DUCTILE IRON PIPE	LF	3,550	\$	\$
60	10” DUCTILE IRON PIPE	LF	20	\$	\$
61	12” DUCTILE IRON PIPE	LF	50	\$	\$
62	12” x 8” DUCTILE IRON TEE	EA	4	\$	\$
63	12” x 4” DUCTILE IRON TEE	EA	1	\$	\$
64	8” x 8” DUCTILE IRON TEE	EA	8	\$	\$
65	8” x 4” DUCTILE IRON TEE	EA	1	\$	\$

* Indeterminate quantity for bidding purposes only

**TOWN OF MANCHESTER BID PROPOSAL SHEET
FOSTER STREET NEIGHBORHOOD INFRASTRUCTURE IMPROVEMENTS
BID NO. 20/21-20**

Bidders must fill in “Bid Unit Price” and “Extended Amount” for each bid item. Extend all prices to two decimals.

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	BID UNIT PRICE	EXTENDED AMOUNT
66	8” – 1/8 DUCTILE IRON BEND	EA	15	\$	\$
67	8” – 1/16 DUCTILE IRON BEND	EA	6	\$	\$
68	6” – 1/8 DUCTILE IRON BEND	EA	4	\$	\$
69	4” – 1/16 DUCTILE IRON BEND	EA	1	\$	\$
70	8” x 6” DUCTILE IRON REDUCER	EA	6	\$	\$
71	12” GATE VALVE	EA	4	\$	\$
72	8” GATE VALVE	EA	18	\$	\$
73	4” GATE VALVE	EA	2	\$	\$
74	HYDRANT ASSEMBLY – NEW MAIN	EA	8	\$	\$
75	REMOVE HYDRANT ASSEMBLY	EA	5	\$	\$
76	REPLACE HYDRANT ASSEMBLY	EA	1*	\$	\$
77	RELOCATE HYDRANT	EA	1*	\$	\$
78	REPLACE VALVE BOX	EA	6*	\$	\$
79	REPLACE VALVE BOX (TOWN FURNISHED)	EA	6*	\$	\$
80	RESET VALVE BOX	EA	6*	\$	\$
81	AIR RELEASE VALVE MANHOLE	EA	1	\$	\$
82	2” WATER BYPASS PIPING	LF	1,000*	\$	\$
83	4” WATER BYPASS PIPING	LF	1,000*	\$	\$
84	RESET MANHOLE TO GRADE (EXISTING FRAME AND COVER)	EA	1*	\$	\$
85	RESET MANHOLE TO GRADE (NEW FRAME AND COVER)	EA	1*	\$	\$
86	SILT FENCE	LF	400	\$	\$
87	SILT SACK	EA	30	\$	\$
88	RESTORATION OF LAWN AREAS	SY	1,500	\$	\$
89	RESET FENCE	LF	250	\$	\$

* Indeterminate quantity for bidding purposes only

**TOWN OF MANCHESTER BID PROPOSAL SHEET
FOSTER STREET NEIGHBORHOOD INFRASTRUCTURE IMPROVEMENTS
BID NO. 20/21-20**

Bidders must fill in “Bid Unit Price” and “Extended Amount” for each bid item. Extend all prices to two decimals.

90	REMOVABLE WOODEN STOCKADE FENCE WITH WOOD POSTS (6' HIGH)	LF	60	\$	\$
91	4" WHITE PAINTED PAVEMENT MARKINGS	LF	300	\$	\$
92	4" YELLOW PAINTED PAVEMENT MARKINGS	LF	900	\$	\$
93	EPOXY RESIN PAVEMENT MARKINGS, SYMBOLS AND LEGENDS	SF	300	\$	\$
94	RESET SIGN	EA	6*	\$	\$
95	CONSTRUCTION STAKING	LS	1	\$	\$
96	ELECTRONIC AS-BUILT DRAWING	LS	1	\$	\$
97	MAINTENANCE AND PROTECTION OF TRAFFIC	DAYS	135	\$	\$
98	TRAFFICPERSON (UNIFORMED POLICE OFFICERS)	DR	1**	\$ 10,000	\$ 10,000
99	TRAFFICPERSON (UNIFORMED FLAGGERS)	HRS	2,160	\$	\$

* Indeterminate quantity for bidding purposes only

** DR = Direct reimbursement for 50% of the total estimated cost for construction in MAIN STREET

TOTAL OF ALL BID ITEMS: \$ _____

- A. The undersigned understands that there may be changes, omissions, or modification in the work, and that appropriate adjustments will be made to the Contract price in accordance with the Contract Documents. The undersigned understands that the Owner reserves the right to accept or reject any or all bids, and to waive all formalities, any irregularities, and accept the Bid deemed to be in the Owner's best interest.
- B. Bid prices shall not include any sales, excise or other taxes for which the Owner is not liable. Town of Manchester is the awarding authority. The bid award is anticipated in **MARCH 2021**. The Bidder agrees to hold the above pricing for sixty (60) days.
- C. The Bid security in the sum of: **5% OF TOTAL BID** is to become the property of the Town in the event the above forms are not executed within the time set forth above, as liquidated damages, and not as a penalty for the delay and additional expense to the Town caused thereby.

Respectfully Submitted By:

(Signature) _____

Name (Please Print): _____

Title: _____

Company: _____

Business Address: _____

Business Phone: () _____

Business Fax: () _____

Email Address: _____

SEAL
(If Bid is by a Corporation)

QUALIFICATIONS OF BIDDER

The undersigned offers the following information as evidence of his qualifications to perform the work as bid upon according to all the requirements of the Contract Documents, including Plans and Specifications. PLEASE PRINT OR TYPE THE FOLLOWING INFORMATION:

Project Name Foster Street Neighborhood Infrastructure Improvements

Bidder's Name _____

Bidder's Address _____

When Organized _____

1. How many years has Bidder been engaged in the contracting business under present firm name?

1a. Former firm names (if applicable). List previous names.

2. The names and addresses of all persons interested in the bid (if made by a partnership or corporation) as Principals, are as follows (attach supplementary list if necessary):

3. The Bidder is requested to state in Table 1 (see following page) a minimum of three (3) projects of similar nature to the project described herein, that the Bidder has completed, with name, address, and telephone number of a reference for each project.

TABLE 1

Project Name and Description	Project Duration	Total Project Cost	Value of Work Performed by Your Company	Project Reference Name, Address and Phone
	From To			
	From To			
	From To			
	From To			
	From To			
	From To			

4. List projects presently under contract by the Bidder, dollar volume of the contract, percent and estimated time of completion:

5. Has the Bidder ever failed to complete work awarded; and if so, state where and why:

6. If the Bidder has worked under the direction of a Consulting Engineer, list recent projects with name, address and telephone number of the Consultant:

7. Does the Bidder plan to sublet any part of this work; and if so, give details: including name, address, phone number, contact person and list of references for each subcontractor.

8. List equipment the Bidder owns that is available for this project:

9. List equipment the Bidder plans to rent or purchase for this project:

10. List name, address, and telephone number for the following:

Surety: _____

Bank: _____

Major Material Supplier: _____

11. List Key Personnel to be employed for this project: _____

12. Remarks: _____

Respectfully Submitted:

By: _____

SEAL
(If Bid is by a Corporation)

CONTRACT AWARD FORMS

Upon receipt of bid acceptance, all of the following documents contained within this section must be completed by the awarded bidder and returned within ten (10) calendar days. Failure to complete and return any of the documents will be cause for forfeiture of the bid security.

- Contract (Page BR-27 to BR-30)
- Certificate of Insurance (To be provided by Contractor)
- Performance Bond (Pages BR-31 to BR-32)
- Labor and Material Payment Bond (Pages BR33 to BR-34)
- Contractor's Wage Certification Form (Page BR-35)

CONTRACT

THIS Contract, made this _____ day of _____, 20___, by and between the Town of Manchester, a municipality located within the County of Hartford in the State of Connecticut, acting through its General Manager, hereinafter called "TOWN," and

_____ hereinafter termed the "CONTRACTOR."

WITNESSETH: That the parties to this Agreement each in consideration of the Agreements on the part of the other herein contained have agreed, and by these presents do hereby agree, the TOWN for itself, and the CONTRACTOR for himself and his heirs, executors, administrators, successors and assigns, as follows:

- A. That the Contract Documents consist of this Contract, together with all attachments including, but not limited to, the Legal and Procedural Documents, General Conditions, Technical Specifications, Contract Drawings, Exhibits and Addenda issued before execution of the Contract, for the Contract, all of which are included as if fully set forth herein;
- B. That the CONTRACTOR has informed himself fully in regard to all conditions pertaining to the place where the Work is to be done and other circumstances affecting the Work;
- C. That the CONTRACTOR has obtained all the information he needed to enable him to estimate fully and fairly the costs of the Work herein contemplated;
- D. That the CONTRACTOR shall furnish all plant, labor, materials, supplies, tools, equipment, other facilities and things necessary for or incidental to properly construct the following:

for the TOWN, in accordance with this Contract, and completing everything required of him under this Contract not later than the time stipulated in the Special Instructions to Bidders and the Form of General Bid.

- E. The CONTRACTOR hereby agrees to commence the work under this Contract on the date to be specified in written Notice to Proceed from the TOWN.
- F. The TOWN shall pay and the CONTRACTOR shall receive as full compensation for fulfilling everything required of the CONTRACTOR under this Contract, the unit prices and lump sums recorded in the Bid, a copy of which is appended to and is made a part of this CONTRACT.
- G. That the quantities shown in the Bid are approximate only and are solely for the purpose of

facilitating the comparison of Bids, that the TOWN shall not be held responsible if these quantities are not even approximately correct, that for all Work upon which unit prices are quoted the CONTRACTOR'S compensation shall be computed upon the Work actually performed, measured by the units of measurement specified, whether greater or less than the quantities as shown in the Bid, and that the unit prices set against the several items cover all incidental services required of the CONTRACTOR under the Contract.

That the CONTRACTOR shall give to the TOWN as liquidated damages, not as a penalty, the sum, if any, as specified in the Special Instruction to Bidders, for each day required by the CONTRACTOR to complete the Work of the Contract beyond the time herein stipulated.

IN WITNESS WHEREOF, the parties to these present have executed this CONTRACT in the year and day first above mentioned.

(TOWN)

(SEAL)

By: _____

(TITLE)

(CONTRACTOR)

(SEAL)

By: _____

(TITLE)

IMPORTANT: Execute Acknowledgement of Officer or Agent of Contractor who signs this document (use proper form next page).

CONTRACT

(ACKNOWLEDGEMENT OF PRINCIPAL, IF A CORPORATION)

State of _____)

) SS:

County of _____)

On This _____ Day of _____, 20___, before me personally came and appeared _____ to me known, who, being by me duly sworn, did depose and say that s/he resides at _____ and that s/he is the _____ of _____, the Corporation described in and which executed the foregoing instrument; that s/he knows the seal of said Corporation; that one of the impressions affixed to said instrument is an impression of such seal; that it was so affixed by order of the Directors of said Corporation, and that s/he signed his/her name thereto by like order.

(SEAL)

NOTARY PUBLIC

CONTRACT

(ACKNOWLEDGEMENT OF PRINCIPAL, IF A PARTNERSHIP)

State of _____)
) SS:
 County of _____)

On this _____ Day of _____, 20___, before me personally came and appeared _____ to me known, and known to me to be, one of the members of the firm of _____, described in and who executed the same as and for the act and deed of said firm.

(SEAL) _____
 NOTARY PUBLIC

* * * * *

CONTRACT

(ACKNOWLEDGEMENT OF PRINCIPAL, IF AN INDIVIDUAL)

State of _____)
) SS:
 County of _____)

On this _____ Day of _____, 20___, before me personally came and appeared _____ to me known, and to me to be the person described in and who executed the foregoing instrument and acknowledged that he executed the same.

(SEAL) _____
 NOTARY PUBLIC

PERFORMANCE BOND

Bond No. _____

KNOW ALL MEN BY THESE PRESENTS:

THAT _____ as Principal,

Hereinafter called "PRINCIPAL," and _____

_____ as Surety, hereinafter called "SURETY," are held and firmly bound unto

the Town of Manchester, Connecticut, as Obligee, hereinafter called "TOWN," in the amount of

_____ Dollars, (\$ _____), for the payment whereof PRINCIPAL and SURETY

bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally,

firmly by these presents.

WHEREAS, PRINCIPAL has by written Contract dated _____ entered into

a Contract with TOWN for _____

_____ which Contract is by reference made a part hereof, and is hereinafter referred to as the

"CONTRACT."

NOW, THEREFORE, the condition of this obligation is such that, if PRINCIPAL shall promptly and faithfully perform said CONTRACT, and shall certify in writing that all wages paid under said CONTRACT to any mechanic, laborer or workman were equal to the rates of wages customary or then prevailing for the same trade or occupation in the Town of Manchester, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

Whenever PRINCIPAL shall be, and declared by the TOWN to be in default under the CONTRACT, the TOWN having performed its obligations thereunder, the SURETY may promptly remedy the default, or shall promptly:

1. Complete the CONTRACT in accordance with its terms and conditions; or
2. Obtain a bid or bids for submission to the TOWN for completing the CONTRACT in accordance with its terms and conditions, and upon determination by the TOWN and SURETY of the lowest possible bidder, arrange for a CONTRACT between such bidder and the TOWN, and make available as work progresses (even though there should be a default or a succession of defaults under the CONTRACT or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract Price; but not exceeding,

including other costs and damages for which the SURETY may be liable hereunder, the amount set forth in the first paragraph hereof. The term, "Balance of the Contract Price," as used in this paragraph, shall mean the total amount payable by the TOWN to PRINCIPAL under the CONTRACT and any amendments thereto, less the amount properly paid by the TOWN to the PRINCIPAL.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the TOWN named herein or the heirs, executors, administrators or successors of TOWN.

Signed and sealed this _____ day of _____, A.D., 20__.

In the Presence of:

_____ (SEAL)
(PRINCIPAL)

By: _____

_____ (SURETY)

By: _____

LABOR AND MATERIAL PAYMENT BOND

Bond No. _____

Note: This bond is issued simultaneously with another bond in favor of the Town of Manchester, Connecticut conditioned for the full and faithful performance of the Contract.

KNOW ALL MEN BY THESE PRESENTS:

THAT _____ as Principal, hereinafter called "PRINCIPAL," and _____ as Surety, hereinafter called "SURETY," are held and firmly bound unto the Town of Manchester, Connecticut, as Obligee, hereinafter called "TOWN," for the use and benefit of claimants as herein below defined, in the amount of _____ Dollars (\$ _____), for the payment whereof PRINCIPAL and SURETY bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, PRINCIPAL has by written Contract dated _____ entered into a Contract with Town for _____ made a part hereof, and is hereinafter referred to as the "CONTRACT."

NOW, THEREFORE, the condition of this obligation is such, that if the said PRINCIPAL shall pay for all labor and materials furnished to himself or his Subcontractors for use in the prosecution of the Work, and used therein, then, this obligation to be void; otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Sections 49-41, 49-41a, 49-41b, 49-42 and 49-43 of the General Statutes (C.G.S.A. and Supp. 1989) of the State of Connecticut and any other applicable laws, and the rights and liabilities hereunder shall be determined and limited by said sections and said other applicable laws, to the same extent as if they were copied at length herein.

Signed and sealed this _____ day of _____, A.D., 20__.

In the Presence of:

_____ (SEAL)
_____ (PRINCIPAL)

_____ By: _____

_____ (SURETY) _____

_____ By: _____

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): _____

SECTION 2

GENERAL CONDITIONS FOR ALL PROJECTS

ARTICLE 1 - DEFINITIONS

Wherever used in these General Conditions or in the other Contract Documents, the following terms shall have the meanings, which shall be applicable to both the singular and plural thereof:

<i>Bid</i>	The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
<i>Bidder</i>	Any person, firm or corporation submitting a Bid for the Work.
<i>Bonds</i>	Bid, performance, labor and materials payment bonds and other instruments of security, furnished by the Contractor and his surety in accordance with the Contract Documents.
<i>Change Order</i>	A written order to the Contractor signed by the Director of Public Works of the Town or his duly authorized agent authorizing an addition, deletion or revision in the Work, or an adjustment in the Contract Price or the Contract Time issued after execution of the Contract.
<i>Contract</i>	The written Contract between the Town of Manchester (hereinafter referred to as "the Town") and the Contractor covering the Work to be performed, including the Contractor's Bid and the bonds.
<i>Contract Date</i>	The date on which the Contractor is directed to commence work, as indicated in the written Notice to Proceed.
<i>Contract Documents</i>	The signed Contract, executed bid bond, performance bond, labor and materials payment bond, Notice of Award, Notice to Proceed, Contract Drawings and Specifications, and Modifications.
<i>Contract Drawings</i>	The drawings and plans which show the character and scope of the Work to be performed and which have been prepared and/or approved by the Engineer and are referred to in the Contract Documents.
<i>Contract Price</i>	The total monies payable to the Contractor under the Contract Documents.
<i>Contract Specifications</i>	The Invitation to Bid, Rules and Regulations for Competitive Bidding, Standard and Special Instructions to Bidders, Insurance and Indemnification Form, Form of General Bid, Qualifications of Bidders, Contract, Addenda (whether issued prior to the opening of Bids or the execution of the Agreement), Performance Bond Form, Labor and Materials Payment Bond Form, General Conditions, Notice to Contractor, Technical Specifications, Appendices and Exhibits.

<i>Contract Time</i>	The number of working days stated in the Contract Documents for the completion of the Work.
<i>Contractor</i>	The person, firm or corporation with whom the Town has executed the Contract.
<i>Day</i>	A calendar day of twenty-four (24) hours measured from midnight to the next midnight.
<i>Engineer</i>	Wherever in the Contract Documents the word "Engineer" is used it shall be understood as referring to the Director of Public Works acting personally or through a duly authorized representative.
<i>Field Modification</i>	A directive, usually verbal, for a minor change or alteration in the Work that causes no increase in Contract Price or extension of Contract Time.
<i>Field Directive</i>	A written directive for a change or alteration in the Work that is the result of a difference in condition between that shown on the Contract Drawings and that found in the field. Each Field Directive will subsequently be reviewed to determine if a Change Order is warranted.
<i>Furnish, Install, etc.</i>	The terms "furnish," "install," "construct," "furnish and install," or any similar term contractions, unless specifically noted to the contrary, shall include all materials, equipment, tools, labor, light, power, transportation and any other incidentals required for the completion of the Work.
<i>Inspector</i>	The authorized representative of the Engineer or Town who is assigned to the Project or any parts thereof.
<i>Modification</i>	<ol style="list-style-type: none"> (1) A Field Modification; (2) A Field Directive; (3) A Change Order; (4) A written clarification or interpretation issued by the Engineer. <p>A modification may only be issued after execution of the Contract.</p>
<i>Notice of Award</i>	The written notice by the Town to the apparent successful Bidder stating that, upon compliance by him with the conditions stated therein within the time specified, the Town will execute and deliver the Contract to him.
<i>Notice to Proceed</i>	Written notification by the Town to the Contractor indicating the date on which the Contractor is expected to commence Work.

<i>Project</i>	The entire construction to be performed as provided in the Contract Documents.
<i>Shop Drawings</i>	All drawings, diagrams, illustrations, brochures, schedules and other data which are prepared by the Contractor, a Subcontractor, Manufacturer, Supplier or Distributor and which illustrate the material, equipment or some portion of the Work.
<i>Subcontractor</i>	An individual, firm or corporation having a direct contract with the Contractor or with any other Subcontractor for the performance of a part of the Work at the site.
<i>Substantial Completion</i>	The date, as certified by the Engineer, when the construction of the Project or a specified part thereof is sufficiently completed in accordance with the Contract Documents, so that the Project or specified part can be utilized for the purposes for which it was intended.
<i>Work</i>	Any and all obligations, duties and responsibilities necessary to the successful completion of the Project assigned to or undertaken by the Contractor under the Contract Documents, including the furnishing of all materials, equipment, tools, labor and other incidentals necessary to complete the Work.

ARTICLE 2 - AVAILABILITY OF LANDS

2.1 RIGHTS-OF-WAY

As indicated in the Contract Documents, the Town will provide, not later than the date when needed by the Contractor, rights of way for access to the lands upon which the Work is to be done, and such other lands which are designated for the use of the Contractor. Easements for permanent structures or permanent changes in existing facilities will be secured and paid for by the Town, unless otherwise specified in the Contract Documents. If the Contractor believes that any delay in the Town's furnishing these lands or providing such easements entitle him to an extension of the Contract Time, he may make a claim therefore as provided hereafter.

Temporary rights of entry giving the Contractor the right to enter upon private property will be secured by the Town for any work on private property that is shown on the Plans.

2.2 MATERIALS AND EQUIPMENT STORAGE

The Contractor will not be allowed to store materials or equipment within Town right-of-way. The Contractor shall provide all additional lands and access thereto that may be required for the storage of materials and equipment. Evidence of agreement(s) with private property owner(s) for the storage of equipment and materials must be provided to the Town. In no case, even with the property owner's consent, will storage of materials or equipment be allowed where such storage will impact existing sightlines at intersecting roadways.

ARTICLE 3 - BONDING AND INSURANCE

3.1 BONDING

In addition to the Bid Bond required under the "Bidding Requirements" section of these Specifications, the Contractor shall furnish a Surety Bond acceptable to the Town in an amount at least equal to 100 percent of the Contract Price as security for the faithful performance of this Contract, and for payment of all persons performing labor under this Contract and furnishing materials in connection with this Contract. The surety on such Bond shall be a duly authorized surety company, satisfactory to the Town and authorized to do business in the State of Connecticut.

In addition, and not in lieu thereof, the Contractor, within thirty (30) days after payment to the Contractor in the manner provided for under this Contract, shall pay any amounts due any Subcontractor, whether for labor performed or materials furnished, when the labor or materials have been included in a requisition for payment submitted by the Contractor and paid by the Town [Conn. Gen. Stat. Sec. 49-41a(a)(1)].

The Contractor shall include in each of its Subcontracts under this Contract, a provision requiring each of the Contractor's Subcontractors to pay any amounts due any of the Contractor's Subcontractor's Subcontractors whether for labor performed or materials furnished, within thirty (30) days after such Subcontractor receives a payment from the Contractor which encompasses labor or material furnished by such Subcontractor [Conn. Gen. Stat. Sect. 49-41a(a)(2)].

3.2 INSURANCE

The Contractor shall furnish Certificates of Insurance in accordance with the provisions indicated under the "Standard Insurance and Indemnification Requirements for Bids, Permits and the Use of Any Town Facility" in the "Bidding Requirements" section of these Specifications.

Said policy may not be canceled or coverage reduced or terms altered in any manner detrimental to the coverage, except after delivery to the Town of written notice not less than sixty (60) days prior. No cancellation provisions in any such insurance policy shall be construed in derogation of the continuous duty of the Contractor to furnish insurance during the term of this Contract.

ARTICLE 4 – CLAIMS

4.1 DEFINITION

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the contract. The term “Claim” also includes other disputes and matters in questions between the Town and Contractor arising out of or relating to the Contract. The responsibility to substantiate claims shall rest with the party making the Claim.

4.2 NOTICE OF CLAIMS

Claims by the Contractor must be initiated by written notice to the Engineer within fifteen (15) calendar days after occurrence of the event giving rise to such Claim or within fifteen (15) calendar days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

4.3 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, except as otherwise agreed in writing, Contractor shall proceed diligently with performance of the Contract and the Town shall continue to make payments in accordance with the Contract Documents.

4.4 CLAIMS FOR ADDITIONAL COST

If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work.

4.5 CLAIMS FOR ADDITIONAL TIME

If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor’s Claim shall include an estimate of cost and of probable effect of delay on progress of the Work as more fully described in the General Conditions. In the case of a continuing delay, only one Claim is necessary.

If abnormal weather conditions are the basis for a Claim for additional time, such Claim shall be documented by date substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

4.6 CLAIMS FOR CONSEQUENTIAL DAMAGES

The Contractor and Town waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes:

1. damages incurred by the Town for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
2. damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination. Nothing contained in this herein shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

ARTICLE 5 - CHANGES IN THE WORK

5.1 GENERAL

Without invalidating the Contract, the Town may, at any time or from time to time, order additions, deletions or revisions in the Work. These will be authorized by Field Modifications, Field Directives or Change Orders. Upon receipt of a Field Modification, Field Directive or Change Order, the Contractor will proceed with the Work involved. All such Work shall be executed under the applicable conditions of the Contract Documents. If any Field Order or Change Order causes an increase in the Contract Price or an extension or shortening of the Contract Time, an equitable adjustment will be made. If any Field Order or Change Order causes a decrease in the Contract Price, the Town shall be entitled to a credit as calculated by the provisions in this Section and may include a shortening of the Contract Time.

- (a) The Engineer may authorize minor changes or alterations in the Work which do not involve extra cost or are not inconsistent with the overall intent of the Contract Documents. These may be accomplished by a Field Modification. If the Contractor believes that any minor change or alteration authorized by the Engineer entitled him to an increase in the Contract Price or an extension of Contract Time, he may make a Claim as provided in the General Conditions.
- (b) Additional Work performed by the Contractor without authorization of a Field Modification, Field Directive or Change Order may not entitle him to an increase in the Contract Price or an extension of the Contract Time except in the case of an emergency or other extenuating circumstances as provided in these General Conditions. In emergencies or other extenuating circumstances, payment shall be handled on an individual basis, as determined by the Engineer, in accordance with these Contract Documents.
- (c) It is the Contractor's responsibility to notify his Surety of any changes affecting the general scope of the Work, changes in the Contract Price or any other changes that require consent of the Surety. The Contractor will furnish proof of consent by the Surety to any such changes. The Contractor will indemnify and save harmless the Town from all damages, losses and expenses, including attorney's fees, incurred by the Town as a result of denial of liability or delay of performance by the Contractor's Surety with respect to any changes in the Work as herein provided.

Once the parties execute a Change Order with respect to any matter, the Contractor shall not be entitled to any change or any Claim for a change, schedule extension or variation or Modification of any other item that was included in such Change Order.

5.2 CHANGES TO CONTRACT TIME

The Contract Time may only be changed by a Change Order. . Any change in the Contract Time resulting from any such Claim shall be incorporated in a Change Order. In the event the Contractor fails to submit a Claim for an extension in the Contract Time in the time period specified in the Contract Documents, Contractor shall be deemed to have waived the right to any change or any other relief.

The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of the Contractor if he makes a Claim therefor as provided in paragraph above. Such delays shall include, but not be restricted to, acts of neglect by any separate Contractor employed by the Town, or Force Majeure Excused Event.

All time limits stated in the Contract Documents are of the essence of the Contract. The provisions of this article shall not exclude recovery for damages (including compensation for additional professional services) for delay by either party.

It is the Contractor's responsibility to notify his Surety of any extension in the Contract Time. The Contractor will furnish proof of consent by the Surety to any such extension. The Contractor will indemnify and save harmless the Town from all damages, losses and expenses, including attorney's fees incurred by the Town as a result of denial of liability or delay of performance by the Contractor's Surety with respect to any changes in the Work as herein provided.

In support of any request for an extension of the contract Time, Contractor must demonstrate to the reasonable satisfaction of Town that the critical path of the Project Schedule was delayed. Contractor shall be entitled to an increase in the Contract Time for the number of days that the critical path was delayed solely as a result of the compensable or excusable event. Contractor shall compare the critical path of the Project Schedule to the actual critical path of the Work, identifying the specific impact of the compensable or excusable event. Contractor shall submit to the Town a written time impact analysis illustrating the influence of each compensable or excusable event on the Date of Substantial Completion. Each time impact analysis shall include a fragmentary network (network analysis) demonstrating how the Contractor proposes to incorporate the delay into Project Schedule. The time impact analysis shall demonstrate the time impact based on the date of the delay in time and the event time computation of all affected activities.

5.3 CHANGES TO CONTRACT PRICE

The value of any Change in Work covered by a Field Directive/Change Order that results in an increase in the Contract Price or credit to the Town shall be determined in one of the following ways:

- (1) By application of unit prices to the quantities of the items involved when the Work involved is covered by unit prices contained in the Contract Documents
- (2) By mutual acceptance of a lump sum.
- (3) By the actual cost of the Work and a fixed amount for overhead and profit.
 - a) Costs shall only include labor (payroll, payroll taxes, fringe benefits, workmen's compensation, etc.), materials, equipment, tools and other incidentals directly related to the Work involved. In such case, the Contractor will submit, in form prescribed by the Engineer, an itemized cost breakdown together with supporting data. The maximum percentage which shall be allowed for Contractor's combined overhead and profit shall be as follows:
 - 1) For all such Work done by his own organization, the Contractor may add up to fifteen percent (15%) of his actual **net increase** in costs, and
 - 2) For all such Work done by Subcontractors, each Subcontractor may add up to ten percent (10%) of his actual **net increase** in costs for combined overhead and profit, and the Contractor may add up to five percent (5%) of the Subcontractor's **net increase** in costs for his combined overhead and profit. No overhead or profit shall be allowed on costs incurred in connection with premiums for public liability insurance or otherwise special insurance directly related to such Work.
 - 3) When determining the amount of credit to the Town for any change which results in a decrease in costs, said credit will be determined by the Engineer. The actual cost of the Work described above minus any credits shall be the **net increase** in costs used to determine combined overhead and profit.

ARTICLE 6 - CONTROL OF THE WORK AREA

6.1 GENERAL HOUSEKEEPING

The Contractor will keep the Work area free from accumulations of waste materials, rubbish and other debris resulting from the Work and legally dispose of same, and at the completion of the Work he will remove all waste materials, rubbish and debris from and about the premises and legally dispose of same, as well as all tools, construction equipment and machinery, and surplus materials. He will leave the site clean and ready for occupancy by the Town.

6.2 DUST CONTROL

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 Town determines that it is necessary to use water or calcium chloride for more effective dust control, the Contractor shall furnish and spread the materials, as directed. If there is no direct method of payment specified elsewhere in the contract documents, this Work will be performed without additional compensation.

6.3 MAINTENANCE OPERATIONS

The Contractor must accommodate routine and emergency maintenance operations performed by the Town (i.e. refuse pickup, leaf collection, snow plowing, etc.) within the Work area.

6.4 SANITARY PROVISIONS

The Contractor shall provide and maintain in a neat and sanitary condition such accommodations for the use of its employees as may be necessary to comply with the regulations and requirements of the State Department of Public Health.

ARTICLE 7 - COORDINATION

7.1 WITH OTHER WORK

The Town may award other contracts in the vicinity of the Work which may proceed simultaneously with the execution of this Contract. The Contractor shall perform his Work, causing as little interference with other Contractors, so far as circumstances will permit. 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 Manchester's 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 in general harmony.

7.2 WITH UTILITY COMPANIES

At least two full days, excluding Saturdays, Sundays and holidays, but not more than thirty days before commencing excavation, the Contractor shall call the telephone number 1-800-922-4455 (Call Before You Dig) to allow notification of utilities. The Contractor shall be responsible for coordinating his own work and that of his Subcontractors with any and all utilities in the work area.

The Contractor shall be responsible to coordinate all construction activities with the appropriate utilities. Where the Engineer determines that the relocation or adjustment of public or private utilities is dependent upon the performance of certain contract requirements, the Contractor shall perform these operations within a reasonable length of time.

The Contractor shall schedule his operations in such a manner as to minimize interference with the operation of the forces of utility companies or the Town in effecting the installation of new facilities as shown on the plans or relocation of their existing facilities. The Contractor shall consider in his bid all permanent and temporary utility appurtenances in their present or relocated positions and installation of new facilities as required for the project; and no additional compensation will be made for delays, inconvenience or damage sustained by him due to interference from the above-noted utility appurtenances or the operation of installing or moving them.

The Contractor shall be responsible to support all utility poles in the vicinity of excavations necessary to perform work under this project. The Contractor must obtain all approvals required by the custodian of the utility pole, and coordinate all work. There will be no direct payment for the support of utility poles.

ARTICLE 8 - ENGINEER'S CONTROL

8.1 GENERAL

In the performance of the Work, the Contractor shall abide by all orders, directions and requirements of the Engineer and shall perform all Work to the satisfaction of the Engineer and, at such time and places, by such methods and in such manner and sequence as he may require. The Engineer shall determine the amount, quality, acceptability and fitness of all parts of the Work, shall interpret the Contract Documents and Modifications and shall decide all other questions in connection with the Work.

The enumeration herein or elsewhere in the Contract Documents of particular instances in which the opinion, judgment, discretion or determination of the Engineer shall control, or in which Work shall be performed to his satisfaction or subject to his approval or inspection, shall not imply that only matters similar to those enumerated shall be so governed and performed but, without exception, all the Work shall be governed and so performed.

The Town shall issue all communications to the Contractor through the Engineer.

The Engineer will **not** be responsible for the Contractor's means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto; and he will **not** be responsible for the Contractor's failure to perform the Work in accordance with the Contract Documents.

The Engineer will **not** be responsible for the acts or omissions of the Contractor or any Subcontractors, or any of his or their agents, servants or employees, or any other persons at the site or otherwise performing any of the Work.

8.2 AUTHORITY AND DUTIES OF THE INSPECTOR

Inspectors employed by the Town shall be authorized to inspect all Work done and material furnished. Such inspection may extend to all or any part of the Work and to the preparation or manufacture of the materials to be used. In case of any dispute arising between the Contractor and the Inspector as to materials furnished or the manner of performing the Work, the Inspector shall have authority to reject material or suspend the Work until the question at issue can be referred to and decided by the Engineer. The Inspector shall **not** be authorized to revoke, alter, enlarge, relax or release any requirements of the Contract Drawings and Specifications, nor to approve or to accept any portion of the Work, nor issue instructions contrary to the Contract Drawings and Specifications. The Inspector shall in no case act as foreman or perform other duties for the Contractor, or interfere with the management of the Work by the latter. Any advice which the Inspector may give the Contractor shall in no circumstance be construed as binding the Town in any way nor releasing the Contractor from fulfillment of the terms of the Contract.

ARTICLE 9 – INSPECTION, TESTING, AND CORRECTION OF THE WORK

9.1 GENERAL

All materials and each part or detail of the work shall be subject at all times to inspection by the Engineer. The Engineer shall be allowed unhindered access to all parts of the work and shall be furnished with such information and assistance by the Contractor as the Engineer deems necessary to make a complete, detailed and timely inspection.

The Contractor shall always notify the Engineer of its intention to perform work on the Project, including notice of the particular work it intends to perform, at least 24 hours before the Contractor commences that work.

The Contractor shall be responsible for coordinating his/her Work with the Engineer at all times. In instances when it shall be necessary to utilize Manchester Public Works Department inspectors during other than normal Department working hours, the Contractor shall make payment to the Town of Manchester for such use. Normal working hours for the Department are from 7:30 a.m. to 4:00 p.m. daily, Monday through Friday, excluding holidays. The Town's holiday schedule is attached to these Contract Documents in an appendix. Payment will be made in accordance with the following:

1. For each Public Works Department employee utilized by the Contractor, the Town shall receive the standard overtime rate paid to the employee by the Department.
2. In the event a Public Works Department employee is called out after the end of normal working hours, minimum payment to the Town by the Contractor for each Department employee utilized shall be at the standard overtime rate for a period no less than four (4) hours. Payment for overtime that is a continuation of the normal working day shall be at the standard overtime rate for the actual hours worked. There will be no charge for use of Department personnel during normal working hours for services provided by the Department.

9.2 TESTING AND INSPECTIONS

Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities.

The Contractor shall make arrangements for such quality control testing as necessary to demonstrate that the Work will meet specifications. Unless otherwise specified, the Engineer shall perform and bear the costs for initial quality assurance testing to verify that the Work meets

specifications. If the results of the initial quality assurance testing reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated inspection(s) and compensation for the Engineer's services and expenses shall be at the Contractor's expense.

Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Engineer prior to construction.

Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

All testing will be in accordance with the methods prescribed by the American Society for Testing and Materials or such other applicable organization as may be required by law or the Contract Documents.

Any work which fails to meet the requirements of any such test, inspection or approval, and any work which meets the requirements of any such test or approval but does not meet the requirements of the Contract Documents shall be considered defective. Such defective work may be rejected, corrected or accepted as provided.

Neither observations by the Engineer nor inspections, tests or approvals by persons other than the Contractor, shall relieve the Contractor from his obligations to perform the Work in accordance with the requirements of the Contract Documents.

9.3 ACCESS TO THE WORK

The Contractor shall provide the Engineer and his representative's safe access to the Work at all times. The Contractor will provide proper facilities for such access and observation of the Work and also for any inspection or testing thereof by others.

9.4 COSTS FOR UNCOVERING WORK

- (1) If any Work is covered contrary to the request of the Engineer, it must, if requested by the Engineer, be uncovered for his observation and replaced at the Contractor's expense.
- (2) If any such Work required so to be inspected, tested or approved is covered up without written approval or consent of the Engineer, it must, if directed by the Engineer, be uncovered for observation at the Contractor's expense.
- (3) If any Work has been covered which the Engineer has not specifically requested to observe prior to its being covered, or if the Engineer considers it necessary or advisable that covered Work be inspected or tested by others, the Contractor, at

the Engineer's request, will uncover, expose or otherwise make available for observation, inspection or testing as the Engineer may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is defective or does not meet the requirements of the Contract Documents, the Contractor will bear all the expenses of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, including compensation for additional professional services, and an appropriate Change Order shall be issued deducting all such costs from the Contract Price. If, however, such work is found to be non-defective and meets the requirements of the Contract Documents, the Contractor will be allowed an increase in the Contract Price or extension of the Contract Time directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction if he makes a claim therefore as provided hereafter.

ARTICLE 10 - INTENT OF CONTRACT DOCUMENTS

It is the intent of the Contract Drawings and Specifications to describe a complete Project to be constructed in accordance with the Contract Documents. The Contract Documents comprise the entire Contract between the Town and the Contractor, and any prior oral representations are null and void. The Contract may be altered only by a Modification.

The Contract Documents are complementary; what is called for by one is as binding as if called for by all. If the Contractor finds a conflict, error or discrepancy in the Contract Documents, he will call it to the Engineer's attention in writing before proceeding with the Work affected thereby. In resolving such conflicts, errors and discrepancies, the documents shall be given precedence in the following order: Contract, Contract Specifications and Contract Drawings. Within the Contract Specifications, the order of precedence shall be: "Section 3 – Project Specific Requirements", "Section 2 – General Conditions for All Projects", "Section 1 – Bidding Requirements". Figure dimensions on drawings shall govern over scale dimensions and detailed drawings over general drawings. Any Work that may reasonably be inferred from the Contract Drawings and Specifications as being required to produce the intended result shall be supplied whether or not it is specifically called for. Work, materials or equipment described in words which so applied have a well-known technical or trade meaning shall be deemed to refer to such recognized standards. The Contractor assumes full responsibility for having familiarized himself with the nature and extent of the Contract Documents, Work, locality, and local conditions that may in any manner affect the Work to be done.

The captions which have been used in these Contract Documents are for convenience only and should not be construed to define or limit the meaning and intent of the paragraphs to which the captions apply.

Wherever in these Contract Documents reference is made to "Form 818", it shall mean, "State of Connecticut, Department of Transportation, Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 818", dated 2020, with all addenda at the time of award. Particular paragraphs and articles cited herein are made a part of these Contract Documents.

The quantities of work as listed in the Proposal Estimate Bid Sheet are to be used for comparison bidding. The quantities in all items of work may differ from the actual quantities of work listed due to actual field locations and conditions.

ARTICLE 11 - LAYOUT OF WORK

Unless noted otherwise in the Contract Documents, the Town of Manchester Survey Unit will be responsible for providing limited layout and staking required for construction. The Contractor shall provide the Engineer a minimum of forty-eight (48) hours advanced notice for all survey requests and shall maintain and protect all survey stakes during construction. The Contractor will be charged \$150.00 per hour for any re-staking required due to the Contractor's negligence in protecting the original stakes.

The Contractor shall be responsible for retaining a Professional Land Surveyor (PLS) licensed in the State of Connecticut for the layout and staking of all the Work when "Construction Staking" is included as a bid item in the Contract. The Town of Manchester will provide to the Contractor's surveyor an electronic copy of the proposed Plan in AutoCAD .dwg or .dxf format to assist in the preparation of construction staking. All stakes shall be maintained as necessary to complete and inspect the Work. The Contractor shall maintain baseline stakes and/or critical control necessary for the Engineer to verify the accuracy of the Work.

ARTICLE 12 - LEGAL REQUIREMENTS

12.1 TERMINATION BY THE TOWN FOR CONVENIENCE

The Town may, at any time, terminate the Contract for the Town's convenience and without cause.

Upon receipt of written notice from the Town of such termination for the Town's convenience, the Contractor shall

- (1) cease operations as directed by the Town in the notice;
- (2) take actions necessary, or that the Town may direct, for the protection and preservation of the Work; and
- (3) except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

In case of such termination for the Town's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

12.2 TERMINATION BY THE TOWN FOR CAUSE

The Town may terminate the Contract if the Contractor:

- (1) repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- (2) fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- (3) repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority;
- (4) otherwise is guilty of substantial breach of a provision of the Contract Documents; or
- (5) adjudged bankrupt or insolvent, or he makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for the Contractor or for any of his property, or if he files a petition to take advantage of any debtor's act, or to reorganize under the bankruptcy or similar laws.

When any of the above reasons exist, the Town, may without prejudice to any other rights or remedies of the Town and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- (1) exclude the Contractor from the site and take possession of all materials, equipment, tools and construction equipment and machinery thereon owned by the Contractor;
- (2) accept assignment of subcontracts pursuant to the General Conditions; and
- (3) finish the Work by whatever reasonable method the Town may deem expedient. Upon written request of the Contractor, the Town shall furnish to the Contractor a detailed accounting of the costs incurred by the Town in finishing the Work.

When the Town terminates the Contract for one of the reasons stated above, the Contractor shall not be entitled to receive further payment until the Work is finished.

If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, and other damages incurred by the Town and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Town. The amount to be paid to the Contractor or Town, as the case may be, shall be certified by the Engineer, upon application, and this obligation for payment shall survive termination of the Contract.

If, in the opinion of the Town, the Contractor is not executing 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 of the Contract Documents the Town may serve notice on the Contractor to adopt such methods as will insure the completion of the Work in the time specified, or in compliance with the terms and stipulations of the Contract Documents. If, within five (5) days after the Town has notified the Contractor that his Work is not carried on satisfactorily as before mentioned, the Town shall have the right to terminate the Contract and manage the Work under the direction of the Engineer, or relet, for the very best interest of the Town as a new Contract, the Work remaining to be done, without, in any manner, affecting or releasing the Bond of defaulting Contractor, and the cost of the Work under said new Contract shall be considered the cost to the Town of the Work left undone by the defaulting Contractor.

ARTICLE 13 - MATERIALS

13.1 GENERAL

The Contractor will provide and pay for all materials, equipment, tools, labor, transportation, construction equipment and machinery, appliances, fuel, power, light, heat, telephone, water and sanitary facilities and all other facilities and incidentals necessary for the execution, testing, initial operation and completion of the Work.

Unless otherwise specified, all materials and equipment incorporated in the Work shall be new. If required by the Engineer, the Contractor will furnish satisfactory evidence as to the kind and quality of materials and equipment.

All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable manufacturer, fabricator or processors, except as otherwise specifically provided in the Contract Documents.

13.2 “OR EQUAL” CLAUSE

Wherever in these Contract Documents a particular brand, make of material, device or equipment is shown or specified and followed by the clause "or equal," such brand, make of material, device or equipment specified shall be regarded as the standard, and shall not preclude the furnishing of items other than those specified where the quality, use and serviceability of the substitute is determined by the Engineer to be the same or equal of the standard. If the clause “or equal” is not used, the particular brand, make of material, device or equipment specified **shall** be provided.

13.3 SHOP DRAWINGS AND SAMPLES

After checking and verifying all field measurements, the Contractor will submit to the Engineer for approval, in accordance with the accepted schedule of Shop Drawing submissions, five (5) copies (or at the Engineer's option, one (1) reproducible copy) of all Shop Drawings, which shall have been checked by and stamped with the approval of the Contractor and identified as the Engineer may require. The data shown on the Shop Drawings will be complete with respect to dimensions, design criteria, materials of construction, manufacturer's certificates and the like to enable the Engineer to review the information as required.

The Contractor will also submit to the Engineer for approval, with such promptness as to cause no delay in Work, all samples required by the Contract Documents. All samples will have been checked by and stamped with the approval of the Contractor, identified clearly as to material, manufacturer, any pertinent catalog numbers and the use for which intended.

At the time of each submission, the Contractor will, in writing, call the Engineer's attention to any deviations that the Shop Drawing or sample may have from the requirements of the Contract Documents.

The Engineer will check and approve with reasonable promptness Shop Drawings and samples, but his checking and approval shall be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents. The approval of a separate item as such will not indicate approval of the assembly in which the item functions. The Contractor will make any corrections required by the Engineer and will return the required number of corrected copies of Shop Drawings and resubmit new samples until approved. The Contractor shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections called for by the Engineer on previous submissions.

No work requiring a Shop Drawing or sample submission shall be commenced until the submission has been approved by the Engineer.

The Engineer's approval of Shop Drawings or sample shall not relieve the Contractor from his responsibility for any deviations from the requirements of the Contract Documents, unless the Contractor has in writing called the Engineer's attention to such deviations at the time of submission and the Engineer has given written approval to the specific deviation, nor shall any approval by the Engineer relieve the Contractor from responsibility for errors or omissions in the Shop Drawings.

13.4 CONNECTICUT SALES AND USE TAX

Materials and equipment purchased for installation in this project will be exempt from the Connecticut Sales and Use Tax under the Connecticut Education, Welfare and Public Health Tax Act. Each Bidder shall take this exemption into account in calculating his bid for the Work.

13.5 SURPLUS EXCAVATED MATERIALS

All surplus excavated material shall become the property of the Contractor, except where otherwise specifically noted in the Contract Documents or required for other portions of the Work as directed by the Engineer. The Contractor shall remove and dispose of such surplus material not required for other portions of the job and legally dispose of same.

ARTICLE 14 - PERMITS

14.1 GENERAL

Permits, fees, and licenses, necessary for the prosecution of the Work shall be secured and paid for by the Contractor. Such permits, licenses, etc., shall be obtained by the Contractor prior to performing any Work and shall include, but not be limited to, water and sewer permits, building permits, landfill permits, de-watering permits and road-cut permits. Evidence of all pertinent licenses shall be provided to the Engineer upon request. **NO FEES WILL BE WAIVED UNLESS SPECIFICALLY INDICATED OTHERWISE IN THE NOTICE TO CONTRACTOR.**

The Contractor will give all notices and comply with all laws, ordinances, rules and regulations applicable to the Work. If the Contractor observes that the Contract Drawings and Specifications are at variance therewith, he will give the Engineer prompt written notice thereof, and any necessary changes shall be adjusted by an appropriate Modification. If the Contractor performs any Work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Engineer, he will bear all costs arising therefrom.

14.2 RIGHT OF WAY PERMIT

Prior to any construction, the Contractor must take out a “Right of Way Permit” with the Town of Manchester Engineering Division.

14.3 WATER AND SEWER PERMIT

Prior to any construction involving or impacting facilities owned and/or operated by the Town of Manchester Water and Sewer Department, the Contractor must take out a “Water and Sewer Permit” with the Town of Manchester Engineering Division.

14.4 LANDFILL PERMIT

Regardless of whether tipping fees are waived or not, any Contractor or subcontractor wishing to dispose of any material at the Town of Manchester Landfill must possess a valid permit for each vehicle entering the Landfill. Contact the Town of Manchester Landfill at 647-3257 for permit fees and other information.

14.5 BUILDING PERMITS

Certain work including, but not limited to, retaining wall construction and electrical work, requires a building permit. The Contractor shall secure building permit(s) for such work at the Town of Manchester Building Department. Contact the Town Building Department at 647-3052 for building permit information.

14.6 SPECIAL PERMITS

Some projects will have required special approval(s) from the Town of Manchester Planning and Zoning Commission, the State of Connecticut Department of Energy and Environmental Protection (DEEP), the United States Army Corps of Engineers or any other agency with jurisdictional rights. In most of these cases, separate plans have been approved and are on file. Any specific permit approval(s) by another agency or commission will be identified in the “Notice to Contractor” section of these Specifications. If such permits are identified, then the approved permit plans are hereby made part of the Contract Documents and the Contractor represents that he/she is fully aware of all the requirements of the permit and his/her intention to comply with such requirements.

14.7 CONNDOT ENCROACHMENT PERMIT

If any of the Work is within or directly abuts a State road, the Contractor must secure and pay for an “Encroachment Permit” from the Connecticut Department of Transportation – District 1. By signing the Contract, the Contractor represents that he/she is fully aware of the permit requirements and of his/her intention to comply with such requirements. The Contractor shall submit a copy of the permit to the Engineer prior to construction.

ARTICLE 15 - PRELIMINARY MATTERS

15.1 CONTRACT DOCUMENTS

At least three (3) counterparts of the Contract and such other Contract Documents as practicable will be executed and delivered by Contractor to the Town within ten (10) days of the Notice of Award. When he delivers the executed Contracts to the Town, the Contractor shall also deliver to the Town such Bonds and Certificates of Insurance as he may be required to furnish in accordance with the Contract Specifications.

15.2 PRECONSTRUCTION MEETING

Prior to any construction, a preconstruction meeting will be held to review schedules, to establish procedures for handling Shop Drawings and other submissions, to review the procedures for processing Applications for Payment and to establish a working understanding between the parties with respect to the Project. Representatives from the Contractor shall be at a minimum the Project Manager and a representative from each major subcontractor.

15.3 KNOWLEDGE OF PROJECT

The Contractor represents that he has familiarized himself with, and assumes full responsibility for having familiarized himself with the nature and extent of the Contract Documents, work, locality and with all local conditions and Federal, State and local laws, ordinances, rules and regulations that may in any manner affect performance of the Work, and represents that he has correlated his study and observations with the requirements of the Contract Documents. Contractor also represents that he has studied all surveys and investigation reports of subsurface and latent physical conditions referred to in the Contract Documents, and made such additional surveys and investigations as he deems necessary for the performance of the Work at the Contract Price, in accordance with the requirements of the Contract Documents, and that he has correlated the results of all such data with the requirements of the Contract Documents. In addition, the Contractor represents that he has contacted all utility companies or contractors who may be doing work in the Project area to insure that their activities and schedules have been taken into account when planning his own Work.

15.4 COPIES OF DOCUMENTS

The Town will furnish the Contractor up to five (5) copies of the Contract Drawings and Specifications as are reasonably necessary for the execution of the Work. Additional copies will be furnished, upon request, at the cost of reproduction.

ARTICLE 16 - PROGRESS PAYMENTS

At least ten (10) days before each progress payment falls due (but not more often than once a month), the Contractor will submit to the Engineer for review the Application for Payment filled out on forms provided by the Engineer and signed by the Contractor covering the Work completed as of the date of the Application and supported by such data as the Engineer may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the Work, but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by such supporting data, satisfactory to the Town, as will establish the owner's title to the material and equipment and protect his interest therein, including applicable insurance.

The Contractor warrants and guarantees that title to all Work, materials and equipment covered by an Application for Payment, whether incorporated in the Project or not, will have passed to the Town prior to the making of the Application for Payment, free and clear of all liens, claims, security interests and encumbrances; and that no Work, materials or equipment covered by an Application for Payment will have been acquired by the Contractor or by any other person performing the Work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.

The Engineer will, within ten (10) days after receipt of each Application for Payment, either indicate in writing his approval of payment and present the Application to the Town, or return the Application to the Contractor indicating in writing his reasons for refusing to approve payment. In the latter case, the Contractor may make the necessary corrections and resubmit the Application.

The Town may withhold some or all of each Progress Payment if the Contractor fails to adequately supply skilled workers to perform the work and/or has not submitted all requisite paperwork.

The amount paid the Contractor shall be the amount due less five percent (5%) retainage. At the completion of the Work, the Town will retain five percent (5%) of the total project for a period of one (1) year. Upon written request by the Contractor, this retainage will be released after a final inspection is made and all items of Work are found to have been performed in accordance with the pertinent Contract Drawings and Specifications.

The Town will, within thirty (30) working days of receipt of an approved Application for Payment, pay the Contractor the amount approved by the Engineer.

ARTICLE 17 - PROSECUTION AND PROGRESS

17.1 GENERAL

It is hereby understood and mutually agreed, by and between the Contractor and the Town, that the date of beginning and the time for completion, as specified in the Contract of the Work to be done hereunder are **essential conditions** of this Contract; and it is further mutually understood and agreed that the Work embraced in this Contract shall be commenced on a date to be specified in the Notice to Proceed.

The Contractor agrees that said Work shall be prosecuted regularly, diligently and uninterruptedly at such rate of progress as will insure full completion thereof within the time specified. It is expressly understood and agreed, by and between the Contractor and the Town, that the time for the completion of the Work described herein is a reasonable time for the completion of the same, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

17.2 LIQUIDATED DAMAGES

If the Contractor shall neglect, fail or refuse to complete the Work within the time herein specified, or any proper extension thereof granted by the Town, then the Contractor does hereby agree, as a part consideration for the awarding of this Contract, to pay to the Town the amount specified in the Contract, not as a penalty but as liquidated damages for such breach of Contract as hereinafter set forth, for each and every calendar day that the Contractor shall be in default after the time stipulated in the Contract for completing the Work.

The said amount is fixed and agreed upon by and between the Contractor and the Town because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Town would in such event sustain, and said amount is agreed to be the amount of damages which the Town would sustain.

17.3 PROGRESS AND COMPLETION

It is agreed that time is of the essence of each and every portion of the Contract Documents wherein a definite and certain length of time is fixed for the performance of any act whatsoever; and where under the Contract an additional time is allowed for the completion of any Work, the new time limit fixed by such extension shall be of the essence of this Contract. Provided that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of Work is due to a Force Majeure excused event or to any delays of Subcontractors or suppliers occasioned by a Force Majeure excused event.

17.4 CONTRACT TIME

- (1) Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Final Completion of the Work.
- (2) The date of commencement of the Work is the date established in the Contract Documents.
- (3) The date of Final Completion is the date the Town notifies the Contractor it achieved Final Completion and has satisfied the conditions required to achieve such milestone.
- (4) The term “day” as used in the Contract Documents shall mean working day unless otherwise specifically defined.
- (5) By executing the Contract the Contractor confirms that the Contract Time is a reasonable period for performing the Work.
- (6) The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by the Contract Documents to be furnished by the Contractor and Town. The date of commencement of the Work shall not be changed by the effective date of such insurance.
- (7) The Contractor shall proceed expeditiously with adequate forces and shall achieve Final Completion within the Contract Time.

17.5 DELAYS AND EVENTS THAT JUSTIFY A TIME EXTENSION

If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Town or Engineer, or of any employee of either, or of a separate contractor employed by the Town; or by changes ordered in the Work; or Force Majeure Excused Event; or by other causes that the Engineer determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Town may determine.

17.6 FORCE MAJEURE EXCUSED EVENT

”Force Majeure Excused Event” shall mean an event outside the asserting Party’s control that materially and adversely affects the performance of the Party (other than payment obligations) and includes, but is not limited to the following: an act of God, fire, tornado, hurricane, flood, earthquake, explosion, war, act of terrorism, civil disturbance, labor strikes away from the site,

actual monthly precipitation or actual monthly snowfall that exceeds the maximums listed for each month shown in the National Oceanic and Atmospheric Administration weather report for the Town of Manchester for the current year and unavoidable casualties beyond Contractor's control.

Force Majeure Excused Events shall not excuse the Contractor (i) if the failure to perform or delay is due to the non-performing Contractor's fault, negligence or lack of diligence; (ii) if the Contractor asserting a Force Majeure Excused Event fails to provide notice as provided herein; or (iii) to the extent that the Force Majeure Excused Event was caused or provoked by the asserting party; (iv) if an experienced contractor could have foreseen and taken reasonable precautions to prevent such event or circumstance; (v) if such event or circumstance does not result in a delay to the critical path of Work; or (vi) where the Party asserting a Force Majeure Excused Event fails to fulfill its obligations as soon as reasonably possible after such Force Majeure Excused Event has been eliminated or has ceased to prevent the affected party from fulfilling its obligations.

If the Parties do not agree that a Force Majeure Excused Event has occurred, the burden of proof shall rest with the asserting Party. If a Force Majeure Excused Event has occurred, the Contractor shall be entitled to a Time Change only.

The Contractor shall, at its sole expense, use its best efforts to avoid and minimize delay resulting from a Force Majeure Excused Event and shall keep the Owner promptly informed of any event which may delay performance of the Work. Delay in the Contractor's receipt of subcontracted portions of the Work, including Materials, for any reason shall not entitle the Contractor to any Change or any other relief, except in the case of a delay in the delivery of Materials due to no fault of the Contractor, the Contractor shall be entitled to a Day for Day time extension until such time that Materials of equal or better quality are delivered.

Within two (2) business Days from the beginning of any delay resulting from a potential Force Majeure Excused Event, the Contractor shall provide a detailed written notice to the Owner of the cause(s) of such delay. In a case of a continuing cause of delay, only one request shall be necessary.

Nothing contained herein shall preclude the Contractor from holding any other contractor(s), subcontractor(s), or entity responsible for unreasonable or unjustifiable delays incurred by the Contractor caused by such other contractor, subcontractor, or entity.

The Contractor's full compliance with the requirements of this Article shall be a condition of receiving any Change and the Contractor's failure to comply with these requirements shall constitute a waiver of any right to a Change or any other claim.

Nothing within this Article shall prevent the Owner from exercising its termination or suspension rights under this Contract.

17.7 SCHEDULE UPDATES THROUGHOUT THE PROJECT

Contractor shall provide at least once per month updated information on the Project Schedule, including thirty (30) day “look-ahead schedules,” projected variances per event category and per subcontractor, identification of all variances and calculation of the number of days difference between the as-built critical path and the Project Schedule critical path. Contractor shall, with each Application for Payment, provide completed monthly updated information for the previous month on the Project Schedule and updated information on manpower indicating as-built and as-planned conditions. The updated information on the Project schedule shall not modify any milestone dates in the Project Schedule that Owner has previously approved.

17.8 WINTER SHUTDOWN

Unless otherwise specified in a “Notice to Contractor”, contract time will not be charged during a winter shutdown period between November 15th and April 1st. The Contractor will not be allowed to work during the winter shutdown (other than maintaining the project area) without the approval of the Engineer. Prior to a winter shutdown, the Contractor and the Town shall meet to discuss the Contractor’s procedures for preparing the Work area for a winter shutdown.

17.9 PROJECT SCHEDULE

The Contractor shall submit a Project Schedule to the Town with delivery of the signed contract identifying the major activities associated with the project, the order and connectivity of such activities, and critical milestone dates. The schedule should identify work being performed by subcontractors. The Town will notify the Contractor if it has objections to the Project Schedule. If notified of an objection, the Contractor shall resolve the issue and re-submit the Project Schedule within five (5) business days. No schedule will be approved that shows any activities beyond the allotted contract time for the project. The Contractor shall update the schedule as determined by the Engineer to be necessary as the project progresses. Upon giving the Contractor a five (5) day written notice, the Town may require the Contractor to prepare a thirty (30) day “Look-Ahead” Schedule.

17.10 TOWN’S RIGHT TO SUSPEND OR STOP WORK

If the Work is defective, or the Contractor fails to supply sufficient skilled workmen or suitable materials or equipment, or if the Contractor fails to make prompt payments to Subcontractors for labor, materials or equipment, the Town may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated.

17.11 TOWN'S RIGHT TO DO WORK

If the Contractor fails to furnish sufficient qualified workers or materials of the required quality or quantity necessary to perform the Work in accordance with the Contract Documents or the Project Schedule for any period of three (3) or more Days after written notice specifying such failure, the Town shall have the option to supply workers, materials, or both, and perform the Work. The Town shall deduct expenses incurred in engaging other Contractors, and supplying workers and material from payments due or which may become due to the Contractor or Retainage. If expenses exceed the balance due or which becomes due to the Contractor, the Contractor shall pay the excess to the Town immediately upon written demand therefore.

Town shall have the right to perform work with its own employees or by other contractors and to permit other entities to do work during the progress and within the limits of, or adjacent to, the project site, and the Contractor shall conduct its Work and cooperate with all others so as to mitigate any possible interference. The Contractor shall allow other contractors or entities access to their work within the project site. The Contractor shall make no claims against the Town for additional payment due to delays or other conditions created by the operations of such other parties.

17.12 RECOVERY SCHEDULE

The Town may, at any time that a non-excusable delay occurs on the Project, request the Contractor to prepare and submit a recovery project schedule that will return the Work to the as-planned Project Schedule so as to achieve Final Completion. The Contractor shall prepare the recovery schedule at no additional expense to the Town.

17.13 TOWN'S EXTENSION OF CONTRACT TIME

The Town may, at any time and without cause, suspend the Work or any portion thereof for a period of not more than ninety (90) days by notice in writing to the Contractor which shall fix the date on which Work shall be resumed. The Contractor will resume the Work on the date so fixed. The Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time directly attributable to any suspension if he makes a claim therefor as provided in the General Conditions.

Should the Work be carried on late in the year, and in the opinion of the Engineer is 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 time of suspension during the winter months shall not be considered in making a claim for extension of Contract Time. The Contractor shall, upon such orders, discontinue work, remove all materials or appliances for or in use upon the work site, 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.

ARTICLE 18 - PROTECTION

In general, the Contractor shall protect all existing features, public or private, within or adjacent to the Work area that is not called out to be removed or replaced.

18.1 EXISTING MONUMENTATION

The Contractor shall be responsible for the protection and replacement of all survey markers, streetline monuments, and private property markers. Prior to construction, the Town will provide information as to the location of all survey markers. Unless noted otherwise in the Contract Documents, any survey markers disturbed or destroyed during construction will be replaced by the Town of Manchester at the Contractor's expense. The fee for replacing survey markers is as follows:

Type of Survey Marker Replaced	Fee
Iron Pipes/Rods/Drill Holes	\$150.00 each
Concrete Monuments (Private Property)	\$300.00 each
Natural Stone Monuments (Private Property)	\$300.00 each
Intersection, Street Corner, Point of Curvature Markers	\$500.00 each
Town GPS Control Network Monument	\$2,500.00 each

Any charges for survey marker replacement will be directly deducted from the Contractor's payment for the month that charges were incurred.

18.2 CONTRACT WORK

The Contractor shall protect his Work so as to prevent damage and/or vandalism to newly poured sidewalks and other concrete surfaces. Any newly poured sidewalks or ramps which are damaged or defaced shall be promptly repaired or replaced at the Contractor's expense. Determination to repair or replace will be at the sole discretion of the Engineer.

18.3 TREES AND SHRUBS

The Contractor will take precautionary measures to protect all public and private trees or shrubs remaining within or adjacent to the Project area. This also includes protection of root systems that may become damaged due to the excavation activities near or adjacent to vegetation designated to remain.

The Contractor shall be fully responsible for compensation, repair, or replacement of any damaged tree or shrub because of neglect by the Contractor or any of his/her assigned Subcontractors.

18.4 UTILITIES

All existing utilities shall be protected and supported according to the specific utility company's requirements. It is the Contractor's sole responsibility to coordinate and communicate with the utility company in question.

18.5 TRAFFIC CONTROL FACILITIES

The Contractor's attention is called to the fact that there are underground traffic control facilities (loop detectors) at various intersections in the Town of Manchester. Should these facilities become damaged during the course of the Work due to the Contractor's negligence; the Contractor will be responsible for replacement of the detectors. Splicing of the existing detectors will not be permitted.

18.6 PRIVATE PROPERTY

Any claims for damage to private property as a result of the Contractor's operations or lack of providing protective measures to prevent such damage will be forwarded directly to the Contractor for action. For each claim, the Contractor shall provide to the Town evidence that the claim has been resolved. The Town will not release final retainage for any project where there are any unresolved claims.

18.7 SUBSURFACE ARCHAEOLOGICAL FINDS

If human burials or human skeletal remains are encountered during construction or agricultural, archaeological or other activity that might alter, destroy or otherwise impair the integrity of such burials or remains, the activity shall cease and not resume until authorized by the Engineer.

ARTICLE 19 - PUBLIC CONVENIENCE

The Contractor shall conduct the work at all times in such a manner as to ensure the least possible obstruction to both vehicular and pedestrian traffic. All equipment and materials shall be placed or stored in such a way and in such locations as will not create a hazard to the general public.

The Contractor shall notify residents in writing at least 24 hours in advance of any work which will close or restrict access to their property. Work shall be coordinated such that no residential driveway access is closed for more than a 24 hour period and such that no commercial driveway access is fully closed at any time.

Work shall be coordinated such that it does not leave any excavated area open for more than one day without prior approval of the Engineer.

Not more than one block at a time of the street shall be torn up, obstructed or closed without the permission of the Engineer. The Contractor shall provide such barricades, signs, warnings, flagmen and shall conduct his Work in such a manner so that hazards to vehicular and pedestrian traffic are at a minimum. If, in the opinion of the Engineer or other Town Public Safety Authorities, additional precautions or measures should be taken in the interest of public safety, the Contractor shall so comply promptly. If the Contractor finds it necessary to close a portion of the road to vehicular traffic, written approval of the Engineer and the Chief of the Manchester Police Department shall be obtained. The Contractor shall notify the Fire Department and any other concerned agencies of such road closing a minimum of 48 hours in advance. Access shall be provided at all times to fire hydrants and precautions shall be taken to prevent freezing of any exposed or partially uncovered water lines.

ARTICLE 20 - RECORD DRAWINGS

The Contractor shall keep one (1) record copy of all Contract Specifications, Contract Drawings, Addenda, Modifications and Shop Drawings at the site in good order and annotated to show all changes made during the construction process. These shall constitute the Record Drawings for the Project, be available to the Engineer at any time and shall be delivered to him upon completion of the Work.

ARTICLE 21 - SAFETY

The Contractor shall comply with all requirements of the Occupational Safety and Health Act (OSHA), applicable laws, building and construction codes. Prior to any Construction, the Contractor shall provide the name of his/her "competent person" who is responsible for project safety.

The Contractor shall furnish to the Engineer a report in duplicate on each accident on the Project or related to the prosecution of the Project which involves personal injury requiring medical treatment or which causes an employee's loss of work time. The Contractor shall also furnish to the Engineer a report in duplicate regarding any accident involving public liability or property damage in connection with the Project.

At all times, the Contractor shall protect his/her work from the motoring or walking public. It will be the Contractor's responsibility to supply and utilize flagmen or Town Police personnel, barricades, signs, drums, cones, etc. throughout the construction. Any sidewalk left excavated at the end of the work shift shall be cordoned off and properly signed to restrict pedestrian access.

The Contractor shall utilize OSHA approved safety caps on all pins or other protruding metal used for sidewalk forms.

Prior to any construction involving trenching and/or shoring, the Contractor shall provide the Town one copy of its "Trenching and Shoring" safety plan.

If any of the Work requires any person to enter into a confined space as defined by OSHA, the Contractor shall submit to the Town a copy of its "Confined Space Entry" procedures.

The Contractor will be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. He will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to:

- (1) All employees on the Work and other persons who may be affected thereby.
- (2) All the Work and materials or equipment to be incorporated therein, whether in storage on or off the site, and
- (3) Other property at the site or adjacent thereto, including but not limited to trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

The Contractor shall take all proper precautions to protect existing access to properties from injury or unnecessary interference. He shall provide proper means of access to any property where the existing access is cut off by the Contractor. 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 for access to hydrants.

No materials or other obstruction shall be placed within fifteen (15) feet of any fire hydrant which, at all times, must be readily accessible to the Fire Department.

The Contractor will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss. The Contractor shall provide and maintain all necessary flagmen, barricades, red lights and warning signs and take all necessary precautions for the protection of the public. He 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 this Contract. He shall make good any damage or injury to his Work or to the property of the Town resulting from lack of reasonable protective precautions, except such as may be due to errors in the Contract Documents, or caused by agents or employees of the Town. He shall adequately protect adjacent private and public property, as provided by law and the Contract Documents. He will notify owners of adjacent utilities when prosecution of the Work may affect them. When the use or storage of explosives or other hazardous materials is necessary for the prosecution of the Work, the Contractor will exercise the utmost care and will carry on such activities under the supervision of properly qualified personnel. All damage, injury or loss to any property referred to in the above paragraphs caused, directly or indirectly, in whole or in part, by the Contractor, Subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, will be remedied by the Contractor, except damage or loss attributable to the fault of the Contract Drawings or Specifications or to the acts or omissions of the Town or anyone employed by the Town or for whose acts the Town may be liable, and not attributable to the fault or negligence of the Contractor.

In emergencies affecting the safety of persons or the Work or property at the site or adjacent thereto, the Contractor, without special instruction or authorization from the Town, is obligated to act, at his discretion, to prevent threatened damage, injury or loss. He will give the Engineer prompt written notice of any significant changes in the Work or deviations from the Contract Documents caused thereby, and a Change Order shall thereupon be issued covering the changes and deviations involved.

ARTICLE 22 - SUBCONTRACTS

22.1 GENERAL

As specified in the Contract Documents and prior to the execution and delivery of the Contract, the successful Bidder will submit to the Engineer for acceptance the following:

- (1) a list of all Subcontractors;
- (2) a list of such other persons or organizations proposed to perform portions of the Work, including those who are to furnish materials or equipment fabricated to a special design.

The prime contractor shall complete a minimum of 50% of the total contract value with his own forces. Prior to the execution and delivery of the Contract, the Engineer will notify the successful Bidder in writing if the Engineer, after due investigation, has reasonable objection to any Subcontractor, person or organization on such list. The failure of the Engineer to make objection to any Subcontractor, person or organization on the list prior to the execution and delivery of the Contract shall constitute an acceptance of such Subcontractor, person or organization but shall not constitute a waiver of any right of the Engineer to reject defective Work, material or equipment not in conformance with the requirements of the Contract Documents.

The Contractor will be fully responsible for all acts and omissions of his Subcontractors and of persons directly or indirectly employed by them, and of persons for whose acts any of them may be liable to the same extent that he is responsible for the acts and omissions of persons directly employed by him. Nothing in the Contract Documents shall create any contractual relationship between any Subcontractor and the Town, or the Engineer or any obligation on the part of the Town or the Engineer to pay or to see to the payment of any monies due any Subcontractor, except as may otherwise be required by law.

The Contractor agrees to specifically bind every Subcontractor to all of the applicable terms and conditions of the Contract Documents. Every Subcontractor, by undertaking to perform any of the Work, will thereby automatically be deemed to be bound by such terms and conditions.

22.2 ASSIGNMENT OF SUBCONTRACTS

Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Town, provided that

- (1) assignment is effective only after termination of the Contract by the Town for Cause pursuant to the General Conditions and only for those subcontract agreements that the Town accepts by notifying the Subcontractor and Contractor in writing; and

- (2) assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Town accepts the assignment of a subcontract agreement, the Town assumes the Contractor's rights and obligations under the subcontract.

Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

Upon such assignment of subcontracts to the Town, the Town may further assign the subcontract to a successor contractor or other entity. If the Town assigns the subcontract to a successor contractor or other entity, the Town shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 23 - SUBSTANTIAL COMPLETION AND FINAL COMPLETION

23.1 SUBSTANTIAL COMPLETION

Substantial Completion shall occur when the Town has confirmed that all of the following conditions have been satisfied or waived in writing by the Town:

1. All Work has been sufficiently completed pursuant to the Contract Documents so that the owner can utilize the Work for its intended use;
2. The punch list (a comprehensive list of items to be completed or corrected prior to Final Payment) has been agreed upon and accepted in writing by the Town;
3. All Work has been completed in accordance with law, and the Contractor has obtained all inspections or certificated of inspections as required by the Contract Documents; and
4. All maintenance and operating instructions, schedules, guarantees, bonds, and other documents, all as required by the Contract Documents, have been submitted to the Town.

When the Contractor considers that the work is substantially complete, the Contractor shall notify the Town in writing. Upon written notice, the Engineer, as representative of the Town, will make an inspection with the Contractor. The Town will notify the Contractor in writing within fifteen (15) days of any particulars in which this inspection reveals that the Work is defective or discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Town can occupy or utilize the Work or designated portion thereof for its intended use. If the Substantial Completion has not occurred, the Contractor shall immediately make such corrections as are necessary to achieve Substantial Completion. The foregoing notice procedure shall be repeated until Substantial Completion occurs. The Town shall issue a notice when Substantial Completion Occurs.

23.2 FINAL COMPLETION

Final Completion shall occur when the following conditions have been satisfied:

1. Substantial Completion has been achieved and the Contractor received notice by the Town;
2. all items on the Punch list have been completed;
3. the Contractor has completed all Work;
4. the Project site is free from construction debris;
5. Contractor has provided the Town record drawings in accordance with Article 20;
6. the Contractor has paid all Liquidated Damages in full, if any were assessed;
7. the Final Payment Application has been submitted with such supporting data as the Engineer may require;

8. the Town has received complete and legally effective releases or waivers (satisfactory to the Town) of all liens arising out of the Contract Documents for the labor and services performed and the material and equipment furnished thereunder, including releases or waivers from each subcontractor; and
9. the Contractor has removed all of its construction equipment, material and support personnel from the Project site.

In lieu of releases or waivers and as approved by the Town, the Contractor may furnish receipts or releases in full; an affidavit of the Contractor that the releases and receipts include all material, equipment, tools and labor bills, and other indebtedness connected with the Work for which the Town or its property might in any way be responsible, have been paid or otherwise satisfied; and consent of the Surety, if any, to final payment.

The Contractor shall notify the Town in writing when it has achieved Final Completion, including all documentation to verify the conditions set forth above have been achieved, and shall submit a Final Payment Application following the procedure for progress payments.

Town shall either notify the Contractor of any reason why Final Completion has not occurred or notify the Contractor in writing that Final Completion has been achieved. The Final Completion date shall be the first date on which all condition for Final Acceptance were satisfied.

Within fifteen (15) days after the receipt of the final Application for Payment and the Engineer is satisfied that the Work has been completed and the Contractor has fulfilled all of his obligations under the Contract Documents, the Engineer will, indicate in writing his approval of payment and present the Application to the Town for payment. Otherwise, he will return the Application to the Contractor, indicating in writing his reasons for refusing to approve final payment, in which case the Contractor will make the necessary corrections and resubmit the Application. Once the Town issues the Final Payment, the Contractor will be deemed to achieve Final Completion.

Final payment shall constitute ninety-five percent (95%) of the final Contract amount. The remaining five percent (5%) will be payable in accordance with the provisions stated herein. The Town will, within thirty (30) days of receipt of an approved final Application for Payment, pay the Contractor the amount approved by the Engineer.

The making of final payment shall constitute a waiver of claims by the Owner except those arising from:

1. Claims, security interests or encumbrances arising out of the Contract and unsettled;
2. Failure of the Work to comply with the requirements of the Contract Documents;
or
3. Terms of special warranties required by the Contract Documents.

Acceptance of final payment by the Contractor, subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of the Final Payment Application.

When the Work or designated portion thereof is substantially complete, the Town will prepare a Notice of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Town and Contractor for security, maintenance, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Notice of Substantial Completion.

ARTICLE 24 - SUBSURFACE UTILITIES

Subsurface information which may be contained in these Contract Documents has been developed from the best available records, the accuracy of which cannot be guaranteed. These locations are subject to possible errors in the source of the information; also, errors in transcription. The Contractor shall make certain of the exact location of mains, ducts, poles and services prior to excavation near utility lines. The Contractor shall cooperate fully with the various utilities and shall plan his Work so that least interference is caused for all parties concerned. The various utility companies will make all adjustments to their own lines except as otherwise shown on the Contract Drawings or detailed in the Contract Specifications. **The Contractor shall give ample notice to "Call Before You Dig" so that existing lines can be marked in the field and adjustments made.** If, in the course of construction, conditions are found which result in changes of alignment and/or delays necessitating the rescheduling of the Contractor's operation, such changes in alignment or rescheduling of operations shall not constitute the basis of a claim for extra payment. **It is anticipated that the Contractor will provide for contingencies which may confront him during the execution of the Work in the preparation of his bid.**

The Contractor shall support all utility lines uncovered due to trench excavation in accordance with the requirements of the specific utility company.

ARTICLE 25 - SUPERVISION

The Contractor will supervise and direct the Work efficiently and with his best skill and attention. He will be solely responsible for the means, methods, techniques, sequences and procedures of construction. Before undertaking the Work, he will carefully study and compare the Contract Documents and check and verify all figures shown thereon and all field measurements. He will at once report in writing to the Engineer any conflict, error or discrepancy which he may discover. The Contractor will be responsible to see that the finished work complies accurately with the Contract Documents.

The Contractor will keep a Resident Superintendent, satisfactory to the Engineer, on the site at all times. The Superintendent shall not be replaced without the consent of the Engineer except under extraordinary circumstances. The Superintendent will be the Contractor's representative at the site and shall have authority to act on behalf of the Contractor. All communications given to the Superintendent shall be as binding as if given to the Contractor.

The Engineer will not be responsible for the acts or omissions of the Contractor, or any Subcontractors, or any of his or their agents, servants or employees, or any other persons performing any of the Work.

ARTICLE 26 - WARRANTY OF WORK

The Contractor warrants and guarantees to the Town and the Engineer that all materials and equipment will be new unless otherwise specified, and that all Work will be of good quality and free from faults or defects and in accordance with the requirements of the Contract Documents and of any inspections, tests or approvals referred to in herein. All unsatisfactory Work, all faulty or defective Work and all Work not conforming to the requirements of the Contract Documents or of such inspections, tests or approvals shall be considered defective. Prompt notice of all defects shall be given to the Contractor. All defective Work, whether or not in place, may be rejected.

If required by the Engineer prior to the issuance of the Certificate of Substantial Completion, the Contractor will promptly, without cost to the Town and as required by the Engineer, either correct any defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by the Engineer, remove it from the site and replace it with non-defective Work. If the Contractor does not correct such defective Work or remove and replace such rejected Work within a reasonable time, all as required by written notice from the Engineer, the Town may have the deficiency corrected or the rejected Work removed and replaced. All direct or indirect costs of such correction or removal and replacement, including compensation for additional professional services, shall be paid by the Contractor and an appropriate Change Order shall be issued deducting all such costs from the Contract Price. The Contractor will also bear the expenses of making good all Work of others destroyed or damaged by his correction, removal or replacement of his defective Work.

If, prior to completion of the punch list resulting from the final inspection at expiration of the warranty period, any Work is found to be defective, the Contractor will, promptly without cost to the Town and in accordance with the Town's written instructions, either correct such defective Work, or, if it has been rejected by the Town, remove it from the site and replace it with non-defective Work. If the Contractor does not promptly comply with the terms of such instructions, the Town may have the defective Work corrected or the rejected Work removed and replaced, and all direct and indirect costs of such removal and replacement, including compensation for additional professional services, will be paid by the Contractor.

Unless otherwise stated in a Notice to Contractor, five percent (5%) of the total Contract Price shall be retained by the Town for a period of one (1) year after substantial completion of the Contract to allow appearance of any defect in materials and workmanship. Within this one (1) year period, the Contractor shall remedy any defective Work appearing and pay for any damages to other Work caused by such defective Work, or occasioned in correcting same. If the Town determines the defective Work creates a situation requiring immediate attention, the Town may have the defective Work removed and replaced. All direct and indirect costs, including compensation for professional services, will be paid by the Contractor. If an excessive amount of defective Work appears during the one (1) year period after the substantial completion, the Town, upon written notice to the Contractor, may extend the retainage period for an additional year.

ARTICLE 27 - WATER AND SEWER PROVISIONS

27.1 OPERATION OF TOWN'S FACILITIES

In instances when it is necessary to operate valves or hydrants which are the property of the Town of Manchester, the Contractor shall coordinate his activities with the Town of Manchester Water and Sewer Department and arrange for the Department to operate such facilities. A minimum of forty-eight (48) hours' notice shall be given the Department to minimize delay and allow public notice where necessary.

27.2 CONTINUANCE OF SERVICE

All Work is to be accomplished in such manner as to minimize the time that water and/or sanitary sewer service will be interrupted. The Contractor shall be responsible for providing all temporary connections and coordinating his activities to ensure that all customers have continuous water and/or sanitary sewer service. The Contractor's attention is called to the fact that the inability to discontinue water service to some customers in the construction area during normal working hours may require work to be done during off hours or the provision of temporary service.

27.3 PAYMENT FOR USE OF WATER AND SEWER DEPT. PERSONNEL AND EQUIPMENT

The Contractor shall be responsible for coordinating his Work with the Manchester Water and Sewer Department at all times. Instances when it shall be necessary to utilize Department personnel and equipment during other than normal Department working hours, the Contractor shall make payment to the Town of Manchester for such use. Normal working hours for the Department are from 7:00 a.m. to 3:30 p.m. daily, Monday through Friday excluding holidays. The Town's Holiday Schedule is attached to these Contract Documents in an Appendix. Payment shall be made in accordance with the following:

- (1) For each Water and Sewer Department employee utilized by the Contractor, the Town shall receive the standard overtime rate paid to the employee by the Department.
- (2) In the event a Water and Sewer Department employee is called out after the end of normal working hours, minimum payment to the Town by the Contractor for each Department employee utilized shall be at the standard overtime rate for a period no less than four (4) hours. Payment for overtime that is a continuation of the normal workday shall be at the standard overtime rate for the actual hours worked.

- (3) For Water and Sewer Department equipment required for use in conjunction with utilization of Department personnel, the Town shall receive the standard rates as charged by the Department for such use.

There will be no charge for use of Water and Sewer Department personnel and equipment during normal working hours for routine services provided by the Department (i.e., open/close valves, shut down mains, shut down notification, etc.). However, use of Department personnel and equipment for non-routine services (i.e., use of vac-truck, etc.) shall be compensated for at the standard rates for personnel and equipment.

27.4 LICENSING REQUIREMENTS

Any person involved in the installation of a water main and/or appurtenances must have a P-1, P-6 or P-7 license or be an apprentice registered with the State of Connecticut Labor Department working under the direct (on-site) supervision of a person possessing a P-1, P-6 or P-7 license.

Any person involved in the installation of a sanitary sewer and/or appurtenances must have either a P-1, P-6, P-7, W-8 or W-9 license or be an apprentice registered with the State of Connecticut Labor Department working under the direct (on-site) supervision of a person possessing a P-1, P-6, P-7, W-8 or W-9 license.

SECTION 3
PROJECT SPECIFIC REQUIREMENTS

NOTICE TO CONTRACTOR - GENERAL

Limitation of Operations

Work hours shall be defined as 7:00 a.m. to 7:00 p.m. Mondays through Fridays. No work shall take place outside those hours without prior permission from the Engineer.

Work During Off-Hours

Work related to this project may impact services to a critical facility or business, which will require some tasks to be completed outside of the work hours defined herein and the normal work hours of the Public Works and Water and Sewer Department personnel defined in the General Conditions. For this project, off-hour work is anticipated to include, but may not be limited to, water main and sanitary sewer work that impacts water and/or sanitary sewer services of commercial properties on or near U.S. Route 6/44 (East Center Street) and such work within the U.S. Route 6/44 State highway right of way.

The Contractor shall notify the Engineer a minimum of forty-eight (48) hours in advance of commencing any off-hour work, which shall be approved by the Engineer. In these instances, the Contractor will not be charged overtime rates for Department of Public Works inspectors and Water and Sewer Department personnel and equipment specified in the General Conditions.

Order of Work

All erosion and sedimentation control devices shall be installed prior to any construction activity.

Other Construction Projects in Area

The Contractor is made aware that the Town intends on bidding a separate project for the rehabilitation and minor sanitary sewer and storm sewer improvements on Spruce St called "Spruce Street Rehabilitation Project." It is anticipated that this project will begin April 1, 2021. Therefore, the schedule for this project must accommodate other planned projects and coordination with other contractors working in the area may be required.

Safety

Implementing worker safety and health protocols that address compliance with all rules, laws and regulations regarding safety and risk of exposure to physical and chemical hazards is the sole responsibility of the Contractor. All employees of the contractor and subcontractors are to wear reflective vests and hard hats at all times when on the project site.

Temporary Storage Areas

The Contractor is responsible for identifying material storage areas for the project that provide safe access and egress for construction vehicles accessing public roads, and for providing appropriate erosion controls and restoration as directed by the Engineer. The Contractor shall not store construction equipment or materials within the public right-of-way.

Disposal of Surplus Material

Surplus materials are the responsibility of the Contractor and shall be properly disposed of in accordance with all local, state and federal regulations.

NOTICE TO CONTRACTOR - GENERAL

Permits

The Contractor may need to obtain a “Building Permit” from the Town’s Building Department and must obtain both a “Right of Way” permit and a “Water and Sewer” permit from the Town’s Engineering Division for this project. All of these permit fees will be waived, with the exception of the State of Connecticut Educational portion of the building permit.

The Contractor must obtain an “Encroachment Permit” from the State of Connecticut Department of Transportation prior to commencing construction within East Center Street (U.S. Route 6/44) and shall be responsible for all associated fees and requirements.

Pre-Construction Meeting

The contractor’s foreman, subcontractors and other responsible personnel that will be directly involved in construction shall attend a pre-construction meeting for this project that will be scheduled by the Town.

Test Pits

The contractor shall perform test pits identified on the plans prior to construction. Contact the Engineering Division at (860) 647-5211 at least forty-eight (48) hours before performing test pits. Test pit data that includes elevations, locations, dimensions and materials of associated utilities must be provided to the town immediately after completion of field investigations. At a minimum, horizontal location of existing pipes must be defined by two (2) ties from a building or other structure shown on the plans and vertical locations must be identified based on project benchmark elevations. Horizontal and vertical locations of proposed work may be adjusted to fit existing field conditions with the approval of the Engineer.

Tree and Brush Trimming and Removal

Any trimming and limited clearing of brush and small diameter trees (up to 6” diameter) required for construction will not be paid for separately and shall be included in the general cost of the contract or items specified on the plans. The contractor shall notify the Engineer of any large trees requiring removal prior to construction, such work shall be completed “by others”.

Indeterminate Quantities

Certain items in the bid (identified with a “*”) are indeterminate quantities; i.e. the quantity cannot be estimated and is based on conditions encountered during construction. For these items, the quantity shown in the bid is for bidding purposes only. No adjustment in unit prices will be made based on final quantities.

NOTICE TO CONTRACTOR - GENERAL

Preliminary List of Required Submittals

The Contractor shall submit shop drawings of the following items for review and approval by the Town during the initial stages of construction. No items shall be installed for the project until approval is obtained. Note that the list is preliminary and it is the Contractor’s responsibility to identify and provide all required submittals in accordance with the Contract Specifications. This list may be modified by the Town at any time during the project.

Technical Specification	Submittal Description
-	Project Schedule
-	Anticipated Source of Material Form
Air Release Valve Manhole	Manhole Structures, Manhole Frames and Covers, Valves, Corporation Stop, Precast Masonry, Brick, Mortar, Waterproof Coating, Concrete Mix Design & Bedding Material
Bituminous Concrete Driveway	Bituminous Concrete Mix, Tack Coat, Joint Seal & Processed Aggregate Base Test Results
Bituminous Concrete Curb	Bituminous Concrete Mix & Tack Coat
Bituminous Concrete Pavement Repair	Bituminous Concrete Mix, Tack Coat & Processed Aggregate Base Test Results
Bituminous Concrete Roadway	Bituminous Concrete Mix, Tack Coat & Processed Aggregate Base Test Results
Bituminous Concrete Sidewalk	Bituminous Concrete Mix, Tack Coat & Processed Aggregate Base Test Results
Cast-in-Place Concrete Curb	Concrete Mix Design, Reinforcing, Dowels, Joint Material & Processed Aggregate Base Test Results
Catch Basins and Storm Manholes	Catch Basin/Storm Manhole Structures, CB/MH Frames and Covers, Mortar, Waterproof Coating & Pervious Material and Granular Fill Test Results
Concrete Driveway Apron	Concrete Mix Design, Reinforcing, Dowels, Joint Material & Processed Aggregate Base Test Results
Concrete Sidewalk and Ramps	Concrete Mix Design, Reinforcing, Dowels, Joint Material & Processed Aggregate Base Test Results
Crushed Stone	Crushed Stone Test Results & Geotextile
Culverts	Drainage Pipe, Concrete Mix Design (incl. Flowable Fill) & Granular Fill, Processed Aggregate Base and Bedding Material Test Results
Erosion and Sedimentation Control	Geotextile, Silt Sacks & Crushed Stone Test Results
Extruded Concrete Curb	Concrete Mix Design & Adhesive
Granite Stone Curb	Granite Stone Curb, Concrete Mix Design, Mortar & Processed Aggregate Base Test Results
Granular Fill	Granular Fill Test Results
Handling Water	Handling Water Plan and all associated material submittals
HMA	HMA Mix, Tack Coat, Joint Seal & Processed Aggregate Base Test Results

NOTICE TO CONTRACTOR - GENERAL

Technical Specification	Submittal Description
Hydrant Assembly	Hydrants, Ductile Iron Pipe, Valves and Fittings, Anchor Tee, Auxiliary Gate, Tapping Sleeves and Valves, Hydrant Paint, Concrete Mix Design, Bedding Material, Joint Restraint & Connecting Sleeves
Maintenance and Protection of Traffic	Traffic Detour Plan (when required)
Miscellaneous Concrete	Concrete Mix Design, Reinforcing & Granular Fill Test Results
Pavement Markings	Marking Paint, Marking Epoxy
Processed Aggregate Base	Processed Aggregate Base Test Results
Replace Valve Box	Valve Boxes, Curb Stops, Extension Stems & Bedding Material
Restoration of Lawn and Wetland Areas and Erosion Control Blanket	Topsoil, Fertilizer, Seed Mix and Erosion Control Blanket
Sanitary Sewer Lateral	PVC Pipe and Fittings, Flexible Couplings, Joint Gaskets, Cleanout Frames and Covers & Mechanical Plugs
Sanitary Sewer Main	PVC Pipe and Fittings, Flexible Couplings, Joint Gaskets, Chimneys & Concrete Mix Design (incl. Flowable Fill)
Sanitary Sewer Manholes	Sanitary Manhole Structures, Manhole Frames and Covers, Precast Masonry, Brick, Mortar, Flexible Joints, Waterproof Coating, Drop Piping & Sand and Granular Fill Test Results
Sewer Bypass Pumping	Bypass Pumps, Piping and Fittings, Joining Systems, Joint Restraints and Bypass Pumping Plan
Water Bypass Piping	Bypass Piping, Valves and Fittings, Couplings, Joint Gaskets, Connecting Sleeves, Joint Restraints and Water Bypass Piping Plan
Water Main	Ductile Iron Pipe, Valves and Fittings, Tapping Sleeve and Valves, Joint Gaskets, Blowoffs, Valve Boxes, Connecting Sleeves, Joint Restraints, Polyethylene Wrap, Pipe Insulation, Concrete Mix Design & Bedding Material
Water Service	Copper Tubing, Corporation Stop, Service Saddle, Couplings, Curb Stop & Curb Box

Note:

Test results for Processed Aggregate Base shall include testing for sieve, hardness and soundness. Only sieve test results are required for all other materials.

NOTICE TO CONTRACTOR – PROSECUTION AND PROGRESS

Prosecution of Work

The Contractor shall commence construction operations immediately upon written notice to proceed from the Town. For this project, the Notice to Proceed date is estimated to be **MARCH, 2021**. The Contractor shall commit sufficient resources to the project to ensure the project is completed within the allotted contract time. Once mobilized, the Contractor shall work continuously on the project until completion. Any unauthorized vacating of the jobsite is subject to penalties described under the “Liquidated Damages” section below.

Contract Time

The contract time allotted for this project is **ONE HUNDRED AND FIFTY (150) WORKING DAYS**. A working day during this period is defined as any day except the following:

1. On Saturdays, Sundays or legal holidays (as defined in Appendix “A”); or
2. During the winter shutdown period from November 15th through April 1st; or
3. During periods of authorized work suspension, except when suspension is ordered for reasons of fault or negligence on the part of the Contractor; or
4. During days where severe weather, in the sole opinion of the Engineer, prevents the Contractor from working at least four (4) hours; or
5. When work involves loaming and seeding or landscaping, during the authorized period between substantial completion of the project and the beginning of the growing season as defined in the specifications;

A “Construction Workday Calendar” and “Weekly Statement of Working Days” form are attached in an Appendix.

A “Weekly Statement of Working Days” form shall be completed weekly by the Engineer and signed by the Contractor as a record of working day charges. No partial payments shall be made unless all “Weekly Statement of Working Days” reports for that period are completed.

Liquidated Damages

The Contractor agrees to pay, as liquidated damages, the amount of **FIVE HUNDRED DOLLARS (\$500.00)** per each consecutive calendar day for the following:

1. When work occurs beyond the contract date of completion; or
2. When the Contractor vacates the project for any reasons not authorized by the Engineer;

Liquidated damages are not intended as a penalty but rather shall be construed as a best estimate of damages which the Town will suffer due to a Bidder’s refusal, failure or neglect to perform pursuant to his Bid and Contract Documents, if his Bid is accepted by the Town. Any assessed liquidated damages will be directly deducted from the Contractors payment.

NOTICE TO CONTRACTOR – PROSECUTION AND PROGRESS

Limitations of Operations

The Contractor shall maintain two lanes of traffic on Spruce Street between the hours of 7:00 a.m. and 8:00 a.m. and between 4:30 p.m. and 5:30 p.m. every day. At a minimum, alternating one-way traffic is expected to be maintained throughout the project area at all times during construction.

Any restrictions on East Center Street (U.S. Route 6/44) shall be determined at the time the Contractor secures an “Encroachment Permit” from the Connecticut Department of Transportation.

Traffic Restrictions

Temporary complete road closure and traffic detours shall be limited to the project area along Foster Street, Madison Street, Hawley Street, Jackson Street, Pearl Street, and Hazel Street. A minimum of alternating one-way traffic is expected to be maintained at all times during non-restricted hours on Spruce Street.

Note that both Jackson Street and Hazel Street are residential “dead-end” streets (no alternate access points available). As such, it will be the Contractor’s responsibility to coordinate and make arrangements for access and/or temporary parking (if necessary) with residents on Jackson Street and Hazel Street impacted during active work on said streets.

Any other unanticipated road closures and detours proposed by the Contractor must be approved by the Engineer prior to implementation. In these instances, the Contractor shall submit a plan of the proposed detour, complete with sign patterns, and estimated duration of detour to the Engineer for approval at least seven (7) days prior to execution. Any additional restrictions on U.S. Route 6/44 (East Center Street) shall be determined at the time the Contractor secures an “Encroachment Permit” from the Connecticut Department of Transportation.

Sanitary Sewer Bypass System

It is anticipated that a sanitary sewer bypass system will be needed for replacing the sanitary sewer main on Spruce Street. Refer to the Sanitary Sewer Bypass System technical specification for additional information.

Spruce Street Rehabilitation Project

The Spruce Street test pit(s) must be completed prior to other test pits shown on the Plans and the information provided to the Engineer. All Work within the Spruce Street right of way, including the portion of sanitary sewer main connecting Pearl Street to Spruce Street within the roadway intersectional area, must be completed prior to all other Work to allow for other construction projects in the area to proceed.

NOTICE TO CONTRACTOR - SPECIFICATIONS

The following definitions shall apply to work completed as part of this Contract:

Standard Specifications

The terms “Standard Specifications” or “Form 818” reference the State of Connecticut, Department of Transportation, The Standard Specifications for Roads, Bridges, Facilities and Incidental Construction, Form 818, dated 2020, including any supplements. Any references to the “Form 816” or “Form 817” shall be construed to mean the equivalent section of the Form 818. Unless supplemental specifications are provided in the Contract Documents, the Standard Specifications shall be referred to for all work required to complete construction of the project. All or portions of the Standard Specifications may be replaced, supplemented, revised or amended as indicated in the supplemental specifications, which shall govern execution of work.

Where the following terms are used within the Standard Specifications, they shall be defined as:

<i>Engineer, State, Department & Commissioner</i>	Town of Manchester Director of Public Works acting alone or through a duly-authorized representative.
<i>Inspector</i>	Town of Manchester Director of Public Works acting alone or through a duly-authorized representative assigned to inspect construction materials and work performed by the Contractor.
<i>Laboratory</i>	Laboratory designated by the Town of Manchester

NOTICE TO CONTRACTOR - UTILITIES

Existence of Underground Utilities

Existing utilities shown on the plans were derived from the best available mapping as provided by the individual utility companies and limited subsurface exploration. These utilities are shown for reference only. The exact size, type, elevation and location of all critical utilities shall be thoroughly investigated by the Contractor prior to the start of construction. The Contractor shall notify "Call Before You Dig" at 1-800-922-4455 and must have all utilities marked out prior to the start of construction.

Licensing Requirements for Work on Water Distribution and Sanitary Sewer Utilities

As stated in Article 27 in the General Conditions provided in these Specifications, any person involved in the installation of a water main and/or appurtenances must have a P-1, P-6 or P-7 license or be an apprentice registered with the State of Connecticut Labor Department working under the direct (on-site) supervision of a person possessing a P-1, P-6 or P-7 license.

In addition, any person involved in the installation of a sanitary sewer and/or appurtenances must have either a P-1, P-6, P-7, W-8 or W-9 license or be an apprentice registered with the State of Connecticut Labor Department working under the direct (on-site) supervision of a person possessing a P-1, P-6, P-7, W-8 or W-9 license.

Utility Relocations

Relocation of utilities is not anticipated for this project pending results of Test Pits identified on the Plan.

The following are the utility company contacts for this project:

Connecticut Natural Gas Corp.

Jonathan Gould
(860) 727-3044
jgould@ctgcorp.com

Frontier Communications

Marc Sweeney (Overhead Utilities)
(860) 521-0692
marc.w.sweeney@ftr.com

Lynne DeLucia (Underground Utilities)
(203) 238-5000
lynne.m.delucia@ftr.com

Cox Communications

Denise Mazzoli
(860) 250-1378
denise.mazzoli@cox.com

Manchester Water and Sewer Dept.

Construction Inspector assigned to project

Eversource Energy

Robert Ferguson
(860) 280-2355
robert.ferguson@eversource.com

Removal of Lead Water Services

The Engineer shall be notified immediately if any existing antiquated lead tubing water services are found during the Work. All lead water services will be replaced under the pertinent Technical Specification as directed by the Engineer.

CLEARING AND GRUBBING

DESCRIPTION

“Clearing and Grubbing” includes the furnishing of all labor, equipment and materials and performing all operations in connection with the clearing and grubbing of trees, stumps, brush, rubbish and all objectionable material within ten (10) feet of the limits of work and where shown on the Plans. The work also includes the proper disposal of all materials resulting from the clearing and grubbing operation away from the project area.

MATERIALS

Not Applicable

CONSTRUCTION DETAILS

Clearing shall include the felling, cutting up and stacking of all trees to four-foot lengths and the satisfactory removal and disposal of trees, bushes, downed timber, brush and debris and obstructions of any nature. Individual trees shown on the Plans or directed by the Engineer to be left standing shall be protected in a satisfactory manner to prevent damage incidental to construction operations.

The Contractor shall mark all trees, shrubs and plants to be removed in accordance with the Plans and Specifications at least seven (7) days prior to removal. The Engineer shall field review the markings and make any adjustments prior to the clearing operation.

For all trees to be removed from within the Town of Manchester right-of-way, the Contractor shall obtain a “Tree Removal” permit from the Town Tree Warden and comply with all of the requirements of such permit, which includes posting notices on these trees for a minimum of ten (10) days.

Grubbing shall include the satisfactory removal and disposal of all stumps, roots larger than one inch in diameter, matted roots, debris, surface boulders 6" or larger and other obstructions to a depth not less than 18 inches below finish ground grades, except that in areas to be occupied by structures they shall be removed in their entirety. Stumps shown to be removed on the plans shall be removed by grinding, or other method approved in writing by the Engineer. All depressions resulting from grubbing shall be refilled with selected materials from earth excavation and/or approved off-site sources graded and compacted so as to conform to adjacent ground surfaces at no additional cost to the Town.

The limits of clearing and grubbing shall typically extend ten (10) feet beyond the limits of disturbance for proposed work unless such work can be completed without disturbing the trees as determined by the Engineer.

The Contractor shall protect all existing trees, shrubs and landscaping, fences, mailboxes, utility poles, signs, sidewalks, driveways and pavements that are to remain. The Contractor shall repair, reset or replace these items as designated by the Engineer at no additional cost. Track type vehicles shall not be allowed on existing pavement areas. Any disturbance of lawn areas outside of the clearing limits shall be restored to pre-construction condition and shall not be measured for payment.

CLEARING AND GRUBBING

MEASUREMENT

“Clearing and Grubbing” will be measured for payment by the lump sum. The lump sum price shall include all the work as described above which may be necessary to properly complete the project. Should the project area be increased in length or the scope of work increased due to construction changes beyond the requirements hereinabove, any additional clearing and grubbing work required will be paid for as extra work. Should the project be decreased in length, a suitable credit, mutually agreed upon and based on the reduction in actual work or scope, will be taken by the Town. The disposal of trees, stumps, etc., will not be measured separately for payment, but its cost shall be considered included in the lump sum price bid for “Clearing and Grubbing”.

PAYMENT

Payment for this work will be at the contract lump sum price for “Clearing and Grubbing”, which price constitutes full compensation for all labor, equipment, tools, supplies, materials, handling, hauling, removal, disposal and work incidental and necessary to complete the clearing and grubbing operation, all in accordance with the provisions of the Plans and Specifications and as directed by the Engineer.

Mailboxes impacted by the proposed construction shall be reset by the Contractor as directed by the Engineer and payment for all associated work shall be included in this item.

Pay Item

Clearing and Grubbing

Pay Unit

Lump Sum

EXCAVATION

DESCRIPTION

“Earth Excavation” shall consist of the removal and satisfactory disposal of all material taken from the area between existing ground and the **finished grade** of new sidewalk or slope and from the area between existing ground and the **finished subgrade** of new pavement. Excavation below the finished grade of new sidewalk or slope necessary to install new sidewalk or slope is included in the unit price bid for “Concrete Sidewalk,” “Bituminous Concrete Roadway” or “Restoration of Lawn Areas” of the type specified.

“Rock Excavation” shall consist of the removal and satisfactory disposal of rock in definite ledge formation and boulders, or the portion of boulders, one cubic yard or more in volume, within the excavation limits as described in “Earth Excavation” above.

“Ditch Excavation” shall consist of the removal and satisfactory disposal of all material taken from the area between existing ground and the finished grade of a new ditch.

Trench excavation for new culverts, sanitary sewers and laterals, water mains and services, underdrains or conduit is included in the unit price bid for “Culvert”, “Sanitary Sewer”, “Sanitary Sewer Lateral”, “Water Main, “Water Service”, “Underdrain” or “Conduit” of the size and type specified.

“Rock in Trench Excavation” shall consist of the removal and satisfactory disposal of rock in definite ledge formation and boulders, or the portion of boulders, one cubic yard or more in volume, within the trench excavation limits.

Excavation for light standards and traffic control foundations is included in the unit price bid for “Light Standard Foundation” or “Traffic Control Foundation” of the type specified.

“Rock in Foundation Excavation” shall consist of the removal and satisfactory disposal of rock in definite ledge formation and boulders, or the portion of boulders, one cubic yard or more in volume, within the foundation excavation limits for light standards and traffic control foundations.

“Test Pit Excavation” shall consist of the careful excavation to determine the horizontal and vertical location and size and material of an existing underground utility where shown on the plans or as directed by the Engineer.

CONSTRUCTION DETAILS

Excavation shall be made in conformance to the limits and grades shown on the plans. Excavation beyond the limits shown on the plans will not be measured for payment. Topsoil, sod and other organic matter shall be removed and disposed of.

When bedrock is encountered, it shall be excavated to the slope lines and depths indicated on the plans. All loose and unstable material shall be removed and disposed of. Any blasting shall

EXCAVATION

conform to applicable local, State and Federal laws and regulations. The Contractor shall be responsible for all damage due either directly or indirectly to such operation.

All excavated material obtained within the project limits shall be used in the formation of embankments. Embankments shall be constructed of earth only. No bituminous concrete or reclaimed waste shall be used in the embankment. The material shall be free from refuse, stumps, roots, rocks, brush, weeds or other unsuitable material.

The depth of each layer, before compaction, shall not exceed twelve inches (12"). The embankment shall be crowned or pitched to provide drainage at the close of each day's operation.

The entire embankment area shall be leveled off by suitable grading equipment and shall be compacted to at least the required minimum density by use of compaction equipment consisting of rollers, compactors or a combination thereof. The dry density after compaction shall not be less than 95 percent of the dry density for that soil when tested in accordance with AASHTO T180, Method D. Each layer shall be compacted at optimum moisture.

All surplus excavated material shall become the property of the Contractor and disposed of off of the project site unless otherwise directed by the Engineer.

Earth slopes shall be tracked by traversing the slopes with cleated tracks so that the cleat indentations are horizontal. Tracking shall be completed prior to placing topsoil. After all grading for the roadbed has been substantially completed and all drains installed, the subgrade shall be brought to the lines, grades and cross-sections shown on the plans. No particle over 3" shall in its greatest dimension be placed within 12" below the top of the prepared subbase.

All soft and yielding material within the subgrade shall be removed and replaced with suitable material. Compaction shall be as specified in Section 2.02 of Form 817. The Contractor shall protect the completed subgrade from damage. The subgrade shall be checked and approved by the Engineer prior to placing pavement structure thereon.

For test pit excavation, the Contractor shall follow all the requirements of "Call Before You Dig", including requesting utility markouts and hand-digging in the vicinity of the underground utility. The Contractor shall notify the Engineer 48 hours in advance of digging the test pit so the Engineer and the appropriate utility representative may be present.

Prior to excavation, the Contractor and Engineer shall agree on the exact location of the test pit based upon available mapping and the utility markout. The Contractor shall adjust the limits of excavation as needed to successfully locate the utility.

Horizontal and vertical locations and size and material of utilities must be obtained during test pit excavation and provided to the Engineer for review. Horizontal utility locations shall be field-surveyed or field-measured with a minimum of two (2) swing-ties from fixed physical features identified on the plans. Vertical utility elevations shall be field-surveyed using a level or

EXCAVATION

other related equipment to provide elevation to the nearest hundredth of a foot (0.01'). The Contractor is made aware that additional test pits may be required and the proposed design may be modified based on results of test pit information obtained.

MEASUREMENT

“Earth Excavation” is considered a **“Final Pay”** item (i.e. the quantity will not be measured for payment but the quantity used for payment purposes will be that shown in the Bid Proposal.) No changes to the quantity shown in the Bid Proposal will be made unless significant changes to the proposed grading are directed by the Engineer. In the case of significant grading changes directed by the Engineer, the quantity shown in the Bid Proposal shall be used as the baseline quantity and agreed measured changes shall be added or subtracted from the baseline quantity.

“Rock Excavation” and “Rock in Trench Excavation” shall be measured for payment by the cubic yard. Payment lines for “Rock Excavation” and “Rock in Trench Excavation” shall coincide with the slope and grade lines as shown on the plans in areas where rock is encountered. The payment lines will be based on a predetermined limit as mutually agreed to by the Engineer and Contractor. Prior to any rock excavation, the Engineer and Contractor shall survey the conditions and agree on the payment limits for each item. In no case will the payment limits extend beyond the lines and grades shown on the plans and cross sections.

“Ditch Excavation” shall be measured for payment by the cubic yard. Payment lines for “Ditch Excavation” shall coincide with the slope and grade lines as shown on the plans. The stockpiling, re-excavation and final placement of material will not be measured for payment. The amount of excavation will be determined by the average end area method.

“Rock in Foundation Excavation” shall be measured for payment by the vertical foot. The payment lines will be based on a predetermined limit as mutually agreed to by the Engineer and Contractor. Prior to any rock excavation, the Engineer and Contractor shall survey the conditions and agree on the payment limits for each item.

“Test Pit Excavation” shall be measured for payment by the cubic yard.

Trench excavation for culverts, sanitary sewers, sanitary sewer laterals, water mains, water services, underdrains and conduits will not be measured for payment; its costs shall be considered as included in the cost for the appropriate item herein.

Excavation for curbs, sidewalk and pavement will not be measured for payment; its costs shall be considered as included in the cost for the appropriate item herein.

PAYMENT

Payment for “Earth Excavation”, “Ditch Excavation”, “Rock Excavation” and “Rock in Trench Excavation” will be made at the contract unit price bid per cubic yard for each item subject to the method of measurement above. The prices shall constitute full compensation for all equipment, tools, and labor incidental to the completion of the excavation, the formation and compaction of

EXCAVATION

embankments, the formation and compaction of subgrades, and the disposal of surplus or unsuitable material in accordance with these Specifications.

Payment for “Rock in Foundation Excavation” will be made at the contract unit price bid per vertical foot subject to the method of measurement above. The price shall constitute full compensation for all equipment, tools, and labor incidental to the completion of the excavation, the disposal of surplus material in accordance with these Specifications and the furnishing of any additional concrete required to fill the excavation beyond the designated foundation hole dimensions.

Payment for “Test Pit Excavation” will be made at the contract unit price bid per cubic yard for each item subject to the method of measurement above. The prices shall constitute full compensation for all equipment, tools, and labor incidental to the completion of the excavation and location of utilities as indicated herein, and the backfill and compaction of the excavation to restore the ground surface to the original condition in accordance with these Specifications.

Pay Item

Earth Excavation
Rock in Trench Excavation
Test Pit Excavation

Pay Unit

Cubic Yard
Cubic Yard
Cubic Yard

GRANULAR FILL

DESCRIPTION

“Granular Fill” includes the furnishing and installation of material to be used as a foundation for structures, to replace unstable material in slopes and shoulders, to replace rock and unsuitable material in trenches, and elsewhere as indicated on the Plans or Specifications or where directed by the Engineer. It shall consist of gravel conforming to the requirements of these specifications.

MATERIALS

Granular fill shall conform to the requirements of Section M.02.01 of Form 817.

CONSTRUCTION DETAILS

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

MEASUREMENT

Only granular fill used to replace unsuitable material and rock in trenches or other areas directed by the Engineer will be measured for payment. It will be measured in place by the cubic yard after compaction within the payment lines shown or specified by the Engineer.

PAYMENT

This work will be paid for at the contract unit price per cubic yard for "Granular Fill", complete in place, which price shall constitute full compensation for all materials, tools, equipment and labor incidental thereto.

Pay Item

Granular Fill

Pay Unit

Cubic Yard

PROCESSED AGGREGATE BASE

DESCRIPTION

“Processed Aggregate Base” shall consist of furnishing and installing processed aggregate base as a foundation for bituminous concrete roadways, concrete sidewalks, curbs, driveways and other items where shown on the Plans in accordance with these Specifications and in conformity with the lines, grades, compacted thickness and typical cross-section as shown on the Plans.

MATERIALS

At the discretion of the Engineer, contractors shall supply copies of material test results, certified by an approved testing laboratory.

The materials for this work shall conform to Section M.05.01 of Form 817.

CONSTRUCTION DETAILS

Coarse aggregate shall be broken stone. Only one type of coarse aggregate shall be used on a project unless otherwise permitted by the Engineer.

Prior to placing the bottom course of the processed aggregate base, the prepared subbase shall be maintained true to line and grade. After the aggregate is spread, it shall be thoroughly compacted and bound by use of equipment approved by the Engineer. Water may be used during the compaction and binding operation.

When the bottom course has been completed, as specified above, the top course aggregate shall be spread over it to such thickness that, after final compaction and binding, the total thickness of the two courses will equal that thickness specified for the completed base. The top course shall be spread, compacted and bound exactly as specified above for the bottom course.

The final surface of the subbase course shall be fine graded so that, after final compaction and just prior to placement of base or pavement courses, the surface elevation shall not vary more than one-quarter inch above or below the design grade at any location. The surface shall be completed to the above tolerance and approved by the Engineer prior to any work at a given location to place an overlying course. If after approval, the course becomes displaced or disturbed in any way for any reason, the Contractor shall repair and regrade the damage to the satisfaction of the Engineer prior to placing the overlying course. All repaired sections shall be recompacted until they meet the requirements as stated herein.

MEASUREMENT AND PAYMENT

“Processed Aggregate Base” shall **not** be measured for payment; its costs shall be included in the prices bid for the items which include this material.

FORMATION OF SUBGRADE

DESCRIPTION

“Formation of Subgrade” shall consist of the grading and compaction of the subgrade to the lines, grades and dimensions shown on the Plans or as directed by the Engineer.

MATERIALS

Not applicable

CONSTRUCTION DETAILS

Construction methods and compaction requirements shall conform to Section 2.09 of Form 817.

If unsuitable material is encountered during this work, it shall be excavated and replaced with granular fill to the depth and limits directed by the Engineer. This additional work shall be measured and paid for as “Earth Excavation” and “Granular Fill” in accordance with these specifications.

MEASUREMENT

“Formation of Subgrade” is considered a “**Final Pay**” item (i.e. the quantity will not be measured for payment but the quantity used for payment purposes will be that shown in the Bid Proposal.) No changes to the quantity shown in the Bid Proposal will be made unless significant changes to the proposed limits are directed by the Engineer. In the case of significant changes to the proposed limits as directed by the Engineer, the quantity shown in the Bid Proposal shall be used as the baseline quantity and agreed measured changes shall be added or subtracted from the baseline quantity.

Formation and compaction of subgrade material for driveways and sidewalks will not be measured for payment, but its costs shall be considered as included in the unit prices for “Driveway”, “Driveway Apron” or “Sidewalk” of the type specified.

PAYMENT

Payment for “Formation of Subgrade” will be made at the contract unit price bid per square yard, which price shall constitute full compensation for all equipment, tools, and labor incidental to the completion of the formation and compaction of subgrades as specified herein.

<u>Pay Item</u>	<u>Pay Unit</u>
Formation of Subgrade	Square Yard

CUT BITUMINOUS CONCRETE PAVEMENT

DESCRIPTION

“Cut Bituminous Concrete Pavement” includes the sawcutting of existing bituminous concrete pavement at locations shown on the plans or as directed by the Engineer. It shall not include the cutting of bituminous concrete pavement associated with trenches, patches or driveways.

MATERIALS

Not applicable.

CONSTRUCTION DETAILS

The existing bituminous concrete pavement shall be sawcut to a neat, straight line at the locations shown on the plans to a depth suitable to remove the pavement without damage to the adjacent pavement to remain.

MEASUREMENT

“Cut Bituminous Concrete Pavement” will be measured for payment by the actual linear feet of cut made to the lines delineated on the plans or as directed by the Engineer. Existing pavement cuts beyond the limits shown on the plans, pavement cuts necessary for trench excavation, installation of curb or drainage structures, driveways, or any other item where the cutting of bituminous concrete pavement is included in the cost of that item, will not be measured for payment under this item.

PAYMENT

This item will be paid for at the contract unit price per linear foot for "Cut Bituminous Concrete Pavement" complete in place, which price shall include all materials, equipment, tools and labor incidental thereto.

Pay Item

Cut Bituminous Concrete Pavement

Pay Unit

Linear Foot

BITUMINOUS CONCRETE (HOT MIX ASPHALT)

DESCRIPTION

“Bituminous Concrete (Hot Mix Asphalt)”, hereafter referred to as HMA, of the type specified includes the furnishing and installation of a bituminous concrete constructed on a prepared processed aggregate base or existing pavement course in accordance with the lines, grades and depths shown on the Plans or as directed by the Engineer. It also includes furnishing quality control testing as required in the Specification.

All references to the “State” or “State Inspector” shall mean the Town of Manchester or the Town of Manchester’s designated inspector.

MATERIALS

HMA shall conform to the requirements of Section M.04 “Bituminous Concrete” of Form 818, latest edition.

Unless otherwise directed by the Engineer, Superpave Design Level 2 shall be used.

CONSTRUCTION DETAILS

HMA shall be installed in accordance with Section 4.06 “Bituminous Concrete” of Form 818, latest edition.

Core correlation density samples as described in Section 4.06.03.10 are required.

If less than 5,000 tons, the furnishing of a “Material Transfer Vehicle” as described in Section 4.06.03.3 will not be required.

MEASUREMENT

“HMA” of the type specified within the limits of roadway construction shall be measured for payment by the actual number of tons, complete and accepted in place.

Adjustments may be applied to bituminous concrete quantities and will be measured for payment using the formulas in Section 4.06.04.2.

Material used for tack coat will not be measured separately for payment, but its cost shall be included in the unit price for “HMA” of the type specified.

Bituminous concrete for driveways and driveway aprons will not be measured for payment under this item; it shall be measured as specified in the item “Bituminous Concrete Driveway”.

PAYMENT

This work will be paid for at the contract unit price bid per ton for “HMA” of the type specified, which price shall constitute full compensation for all equipment, tools, labor and materials incidental thereto. No separate payment will be made for tack coat or material transfer vehicle.

BITUMINOUS CONCRETE (HOT MIX ASPHALT)

Pay Item

HMA S0.5

HMA S1.0

Pay Unit

Ton

Ton

BITUMINOUS CONCRETE PAVEMENT REPAIR

DESCRIPTION

“Permanent Pavement Repair” shall consist of the constructing a full depth pavement repair in an existing roadway of the classification specified where shown on the Plan or where directed by the Engineer. The surface course pavement structure shall consist of bituminous concrete constructed on a prepared stabilized base and in accordance with lines, grades as shown on the Plans, or as directed by the Engineer. It shall also include all excavation, furnishing, installing and compacting of processed aggregate base, sawcutting the existing pavement as required, and the resetting of storm drainage and utility structures and any pavement surrounding these structures.

“Temporary Pavement Repair” shall consist of the constructing a pavement repair in an existing roadway of the classification specified for temporarily repairing all pavement cuts and other pavement areas specified by the Engineer. The surface course pavement structure shall consist of bituminous concrete constructed on a prepared stabilized base and in accordance with lines, grades as shown on the Plans, or as directed by the Engineer. It shall also include all excavation, furnishing, installing and compacting of processed aggregate base, sawcutting the existing pavement, and the resetting of storm drainage and utility structures and any pavement surrounding these structures.

MATERIALS

Bituminous Concrete shall conform to the requirements of Section M.04 of Form 817.

All materials will be supplied from a plant certified and approved by the State of Connecticut, Department of Transportation.

Processed aggregate base shall conform to the specification for “Processed Aggregate Base” elsewhere in these Specifications.

If it is found that any Bituminous Mixture, even though meeting the requirements of the Job Mix Formula, fails to perform satisfactorily, the producer shall on notice (1) immediately cease furnishing the material, (2) take immediate corrective steps to provide a mix which does perform satisfactorily.

When bituminous concrete is laid, only material conforming to the requirements of these specifications and approved by the Engineer shall be used in the work. If tests of samples removed from the work reveal that the mixture is inconsistent or that other than approved materials have been incorporated in the mixture, or that the mixture is not in accordance with the specifications and the product proves unsatisfactory, the Town reserves the right to demand the replacement of the unsatisfactory bituminous concrete. All expenses of the Town incidental to such replacement, including all costs incurred in putting the road in satisfactory condition, shall be paid by the Contractor.

The tack coat to be used on all cold joints shall conform to the requirements of Section M.04 of Form 817.

BITUMINOUS CONCRETE PAVEMENT REPAIR

CONSTRUCTION DETAILS

Transportation of Mixtures: The mixture shall be transported from the paving plant in trucks having tight bodies, which have previously been cleaned of all foreign material. The use of kerosene, gasoline, fuel or similar products for the coating of the inside of truck bodies is strictly prohibited. Such coatings may consist of soapy water or commercial oil emulsions (also known as soluble oils) in the proportion of one (1) part oil to six (6) parts water. When such coatings are applied, truck bodies shall be raised immediately prior to loading to remove any excess coating material. Loaded trucks shall be covered with waterproof canvas or other suitable covers.

The mixture shall be delivered at a temperature within -4 degrees Celsius (25 degrees Fahrenheit) of the approved job mix formula.

Paving Equipment: The paving machine to be used shall be a self-powered type with an adapter to provide guidance of the screeding action. The screed or strike-off member shall be adjustable to the shape of the cross section of the existing pavement. Some method shall be provided for the tilting of the screed while in operation to secure the proper "pulling" and to result in a uniformly screeded surface. The machine shall have sufficient number of driving wheels so that there will be no undue amount of slippage. Means shall be provided for heating the screeding members by some method that will prevent accumulations of bituminous materials.

Placement of Mixture: The areas to be repaired shall be sawcut and the existing pavement and base material removed to the depth shown on the Plan. The excavated area shall then be filled with processed aggregate base to the depth identified on the Plans and shall be installed and compacted in maximum 6" lifts.

The mixture shall be laid only when the surface is free of frost, dried to the satisfaction of the Engineer, and when the weather is not foggy or rainy. Operations shall be carried only when the atmospheric temperature in the shade is not less than 4 degrees Celsius (40 degrees Fahrenheit) unless approval is given by the Engineer. Upon arrival, the mixture shall be immediately spread and struck-off to the width required and to such appropriate loose depth so that the compacted pavement will conform to the specified depth.

In order to obtain tight and well-compacted longitudinal joints, the sequence of the bituminous concrete placing operations shall be subject to the control of the Engineer.

Before any compaction is started, the surface shall be checked and inequities adjusted; all "drippings," i.e. fat, sandy accumulations, and all fat spots from any source, shall be removed and replaced by satisfactory material.

In areas where, on account of physical limitations, it is impractical to operate the paving equipment, the Engineer will permit the use of other type spreader or the mixture may be spread and screeded by hand.

BITUMINOUS CONCRETE PAVEMENT REPAIR

The Contractor shall cut to the limits of the area to be repaired a minimum of 150 mm (six (6) inches) beyond each side of the disturbed area or into the existing pavement with a cutting saw. The saw cut shall be vertical and in straight lines. After the pavement has been removed to a depth of 450 mm (eighteen (18) inches) below the existing pavement surface, the roadway base shall be installed, graded and compacted in accordance with the specification for “Processed Aggregate Base”. The roadway base shall be placed in layers not to exceed 150 mm (six (6) inches) in depth and to such a depth that after compaction it shall be at the specified depth shown on the plans. Contact surfaces of curbing, manholes, etc. shall be painted with a thin uniform coat of hot asphalt cement or tack coat just before the material is placed against them. Such asphalt cement or tack coat shall not be paid for. Hot-laid bituminous concrete shall be placed evenly and uniformly to a minimum compacted thickness of six (6) inches. The maximum thickness to be placed per course shall be two (2) inches. Immediately before placing the mixture, the road surface shall be cleaned by brooming or as otherwise directed by the Engineer.

Refueling of equipment in such a position that fuel might be spilled on bituminous concrete mixtures already placed or to be placed is prohibited.

Solvents and cleaners for use in cleaning mechanical equipment or hand tools shall be stored well clear of areas paved or to be paved.

Compaction: After spreading and when sufficient set has developed to permit proper compaction, each course shall be compacted by rolling, consisting of initial or breakdown rolling, intermediate rolling and final or finish rolling. Initial rolling shall be performed with a power driven steel wheel tandem or three wheel rollers weighing not less than ten (10) tons. Intermediate rolling shall be done by a power driven steel wheel tandem roller. Final rolling shall be done with a self-propelled pneumatic tire roller equipped with Wide-tread compaction tires capable of exerting an average contact pressure from 60 to 90 pounds per square inch uniformly over the surface, adjusting ballast and tire inflation pressure as required. The Contractor shall furnish evidence regarding tire size, pressure and loading to confirm that the proper contact pressure is being developed and that the loading and contact pressure are uniform for all wheels.

Rolling shall begin at the sides and progress toward the center, parallel to the centerline of the roadway. Alternate trips of the roller shall be terminated in stops at least three feet distant from any preceding stop.

Other rolling procedures may be directed by the Engineer, as conditions may require. Rolling shall be discontinued if the surface shows signs of excessive cracking or displacement and shall be continued later as directed. If it is found that the cracking and displacement continues, the paving operation shall be discontinued until the cause of the condition is corrected. Rolling shall proceed continuously and in such a manner that all roller marks are eliminated. The rollers shall be in good condition. They shall be operated by experienced roller operators and must be kept in continuous operation as nearly as practicable in such manner that all parts of the pavement shall receive substantially equal compression.

BITUMINOUS CONCRETE PAVEMENT REPAIR

In no case shall the Contractor use methods or equipment, which will result in fractured aggregate or lateral displacement of the material.

In all places inaccessible to a roller, such as adjacent to curbs, headers, gutters, and manholes, the required compression shall be secured with tamps. Depressions which may develop before the completion of the rolling shall be remedied by adding new material to bring such depressions to a true surface. Should any depressions remain after the final compaction has been obtained, new material shall be added to form a true and even surface. All high spots, high joints and other defects shall be adjusted as directed by the Engineer.

Placing of the pavement shall be as nearly continuous as possible and the roller shall pass over the unprotected end of the freshly laid mixture only when laying of the pavement is discontinued or interrupted for an appreciable period and joints shall be formed at such point. Where joints are to be formed, the edge of the existing pavement shall be cut square with the pavement. Before new material is laid, a thin coating of hot asphalt shall be applied to the vertical face of the cut pavement.

Depressions which may develop after initial rolling shall be remedied by scarifying the surface mixture laid and adding new material to bring such depressions to a true surface.

For permanent pavement repairs, all joints between new and existing pavements shall be sealed with an approved liquid bituminous concrete sealer material.

Protection of the Work: Sections of the newly finished bituminous work shall be protected from traffic to prevent damage to the finished mat.

MEASUREMENT

“Permanent Pavement Repair” will be measured by the actual number of square yards of bituminous concrete pavement repair completed and accepted in accordance with pay limits identified in the associated details on the Contract Plans. Excavation, asphalt emulsion tack coat, joint seal material, formation and compaction of subgrade, installation and compaction of processed aggregate base, sawcutting the existing pavement and bituminous concrete pavement shall not be measured for payment; these costs shall be considered as included in the unit price bid for “Permanent Pavement Repair”.

“Temporary Pavement Repair” of the type specified will be measured for payment by the actual number of square yards of bituminous concrete pavement repair installed and accepted in accordance with pay limits identified in the associated details on the Contract Plans. Asphalt emulsion tack coat, formation and compaction of subgrade, installation and compaction of processed aggregate base, and sawcutting the existing pavement shall not be measured for payment; these costs shall be considered as included in the unit price bid for “Temporary Pavement Repair” of the type specified.

BITUMINOUS CONCRETE PAVEMENT REPAIR

Due to existing pavement conditions in some areas, the Engineer may direct the Contractor to construct wider pavement repairs to provide suitable joints between new and existing pavement, which shall be measured and paid for in accordance with this Specification.

PAYMENT

The work will be paid for at the contract unit price per square yard for “Permanent Pavement Repair” complete and in place, to the pay limits and dimensions as shown on the plans and details, including all material, labor, tools and equipment incidental to the completion of the work and resetting of all storm basins, manholes and utility structures including any pavement around the structures. It shall include all excavation, asphalt emulsion tack coat, formation and compaction of subgrade, installation and compaction of processed aggregate base, sawcutting the existing pavement and bituminous concrete pavement.

The work will be paid for at the contract unit price per square yard for “Temporary Pavement Repair” of the type specified complete and in place, to the pay limits and dimensions as shown on the plans and details, including all material, labor, tools and equipment incidental to the completion of the work and resetting of all storm basins, manholes and utility structures including any pavement around the structures. It shall include all asphalt emulsion tack coat, formation and compaction of subgrade, installation and compaction of processed aggregate base, and sawcutting the existing pavement.

Due to existing pavement conditions in some areas, the Engineer may direct the Contractor to construct wider pavement repairs to provide suitable joints between new and existing pavement, which shall be measured and paid for in accordance with this Specification.

<u>Pay Item</u>	<u>Pay Unit</u>
Permanent Pavement Repair (State Arterial Road)	Square Yard
Permanent Pavement Repair (Town Arterial Road)	Square Yard
Permanent Pavement Repair (Town Local Road)	Square Yard
Temporary Pavement Repair (State Arterial Road)	Square Yard
Temporary Pavement Repair (Town Arterial Road)	Square Yard
Temporary Pavement Repair (Town Collector Road)	Square Yard
Temporary Pavement Repair (Town Local Road)	Square Yard

BITUMINOUS CONCRETE DRIVEWAY

DESCRIPTION

“Bituminous Concrete Driveway” includes the construction of a bituminous concrete surfaced driveway or driveway apron, constructed on a processed aggregate base course in the locations and to the dimensions and details shown on the Plans, as directed by the Engineer and in accordance with these Specifications.

MATERIALS

Processed Aggregate Base shall conform to the requirements of “Processed Aggregate Base” elsewhere in these Specifications.

Bituminous concrete shall meet the requirements of Section M.04, HMA S0.375, of Form 817.

Tack coat to be used on all cold joints shall conform to the requirements of Section M.04.01.5 of Form 817.

Joint seal shall conform to the requirements of Section M.04.01.8 of Form 817.

CONSTRUCTION DETAILS

1. Excavation: Excavation, including removal of any existing sidewalk, driveway, or driveway apron shall be made to the required depth below the finished grade, as shown on the Plans or as directed by the Engineer. All soft and yielding material shall be removed and replaced with suitable material.
2. Forms: When the bituminous concrete is spread by hand, forms shall be used. Forms shall be of metal or wood, straight, free from warp and of sufficient strength to resist springing from the impact of the roller. If of wood, they shall be of two (2) inch surfaced plank except that at sharp curves thinner material may be used; if of metal, they shall be of an approved section. All forms shall be of a depth equal to the depth of the sidewalks or driveways and shall be securely staked, braced, and held firmly to the required line and grade. All forms shall be cleaned and oiled each time they are used.
3. Base Course: Processed Aggregate Base for the base course shall be uniformly spread upon the subgrade to the required depth and thoroughly compacted with a roller weighing not less than 500 pounds.
4. Bituminous Concrete Surface: This surface shall be constructed in accordance with the requirements of Section 4.06 of Form 817, except that the material may be spread by hand and thoroughly compacted by multiple passes of a roller weighing not less than 500 pounds.
5. Backfilling and Removal of Surplus Material: The sides of the driveway or apron shall be backfilled with suitable material and thoroughly compacted and finished flush with the top of the driveway. All surplus material shall be removed and the site left in a neat and presentable condition to the satisfaction of the Engineer. In sections inaccessible to the

BITUMINOUS CONCRETE DRIVEWAY

roller, the base course, surface course and backfill shall be hand-tamped with tampers weighing not less than 12 pounds, the face of which shall not exceed 50 square inches in area.

6. Where a joint is formed, the old pavement shall be sawcut square with the pavement in a vertical and horizontal direction. The exposed edge shall receive a thin coating of RS-1 or other approved bitumen. The joint between the new and old pavement shall be sealed with an approved joint sealant.

MEASUREMENT

“Bituminous Concrete Driveway” will be measured by the actual number of square yards of “Bituminous Concrete Driveway” constructed and accepted.

The following items will not be measured separately for payment, but shall be considered as included in the unit price bid for “Bituminous Concrete Driveway”:

1. Excavation
2. Processed Aggregate Base
3. Removal and disposal of existing sidewalks or pavement within the driveway or apron excavation limits
4. Tack Coat
5. Sawcutting
6. Joint Sealant

PAYMENT

This work will be paid for at the contract unit price for “Bituminous Concrete Driveway”, which price shall constitute full compensation for excavation, removal and disposal of existing sidewalk or driveway, sawcutting, processed aggregate base, formation of subgrade, tack coat, joint seal, and all materials, equipment and labor necessary to complete the work as specified on the Plans or as directed by the Engineer.

Driveways damaged due to carelessness on the part of the Contractor shall be restored by the Contractor, as directed by the Engineer, at no expense to the Town.

<u>Item</u>	<u>Pay Unit</u>
Bituminous Concrete Driveway	Square Yard

BITUMINOUS CONCRETE SIDEWALK

DESCRIPTION

“Bituminous Concrete Sidewalk” includes the removal of existing bituminous or concrete sidewalk and the construction of a bituminous concrete surfaced sidewalk, constructed on existing compacted base course in the locations and to the dimensions and details shown on the Plans, or as directed by the Engineer.

For this project, it is intended that bituminous concrete sidewalk will be installed as a temporary measure when existing sidewalk within the public right-of-way will be disturbed for utility installations and is to be replaced with concrete sidewalk later in the project. Locations and limits of temporary bituminous concrete sidewalk installation will be only as directed and approved by the Engineer during construction.

MATERIALS

Bituminous Concrete shall conform to the requirements of Section M.04, Class 2, of Form 817.

Processed aggregate base shall conform to the specification for “Processed Aggregate Base” elsewhere in these Specifications.

The tack coat to be used on all cold joints shall conform to the requirements of Section M.04 of Form 817.

Joint seal shall conform to the requirements of Section M.04.01.7 of Form 817.

CONSTRUCTION DETAILS

1. Preparation: Existing sidewalk, driveway, or driveway apron shall be removed to the required depth below the finished grade, as shown on the Plans or as directed by the Engineer. The existing base material shall be compacted and any loose material removed. If, in the opinion of the Engineer, the existing base material is unsuitable, the base material shall be replaced in accordance with the “Full Depth Base Repair” specification. Joints between new and old sidewalk surfaces shall be sawcut and joint sealed.
2. Forms: When the bituminous concrete is spread by hand, forms shall be used. Forms shall be of metal or wood, straight, free from warp and of sufficient strength to resist springing from the impact of the roller. If of wood, they shall be of two (2) inch surfaced plank except that at sharp curves thinner material may be used; if of metal, they shall be of an approved section. All forms shall be of a depth equal to the depth of the sidewalks or driveways and shall be securely staked, braced, and held firmly to the required line and grade. All forms shall be cleaned and oiled each time they are used.
3. Bituminous Concrete Surface: This surface shall be constructed in accordance with the requirements of “Full Depth Pavement Repair” specification for hand work.
4. Backfilling and Removal of Surplus Material: The sides of the sidewalk shall be

BITUMINOUS CONCRETE SIDEWALK

backfilled with suitable material and thoroughly compacted and finished flush with the top of the sidewalk. All surplus material shall be removed and the site left in a neat and presentable condition to the satisfaction of the Engineer.

MEASUREMENT

“Bituminous Concrete Sidewalk” will be measured by the actual number of square yards of “Bituminous Concrete Sidewalk” constructed and accepted.

The following items will not be measured separately for payment, but shall be considered as included in the unit price bid for “Bituminous Concrete Sidewalk”:

1. Excavation (including removal of existing sidewalk and base material as required)
2. Compaction of existing subbase and base materials
3. Sawcutting at joints between new and old sidewalk
4. Joint Sealant
5. Backfill and surface restoration

PAYMENT

This work will be paid for at the contract unit price for “Bituminous Concrete Sidewalk”, which price shall constitute full compensation for excavation, removal and disposal of existing sidewalk or driveway, sawcutting, compacting existing base, joint seal, backfill, surface restoration and all materials, equipment and labor necessary to complete the work as specified on the Plans or as directed by the Engineer.

Sidewalks damaged during the construction due to carelessness on the part of the Contractor shall be restored by the Contractor, as directed by the Engineer, at no expense to the Town.

Pay Item

Bituminous Concrete Sidewalk

Pay Unit

Square Yard

CONCRETE SIDEWALK AND CONCRETE SIDEWALK RAMPS

DESCRIPTION

“Concrete Sidewalk” of the thickness specified includes the construction of concrete sidewalk on a prepared processed aggregate base course in conformance with the lines, grades, dimensions and details as shown on the Plans, or as directed by the Engineer. It shall also include the sawcutting, removal and disposal of existing sidewalk, steps, ramps or pavement within the excavation limits for “Concrete Sidewalk”.

“Concrete Sidewalk and Curb Monolithic” of the thickness specified includes the construction of concrete curb and sidewalk, monolithically poured, on a prepared processed aggregate base course in conformance with the lines, grades, dimensions and details as shown on the Plans, or as directed by the Engineer. It shall also include the sawcutting, removal and disposal of existing sidewalk, steps, ramps or pavement within the excavation limits for “Concrete Sidewalk and Curb Monolithic”.

“Reinforced Concrete Sidewalk” of the thickness specified includes the construction of concrete sidewalk reinforced with welded wire fabric on a prepared processed aggregate base course in conformance with the lines, grades, dimensions and details as shown on the Plans, or as directed by the Engineer. It shall also include the sawcutting, removal and disposal of existing sidewalk, steps, ramps or pavement within the excavation limits for “Reinforced Concrete Sidewalk”.

“Concrete Sidewalk Ramp” of the thickness specified includes the construction of a concrete ramp on a prepared processed aggregate base course in conformance with the lines, grades, dimensions and details as shown on the Plans, or as directed by the Engineer. It shall also include the sawcutting, removal and disposal of existing sidewalk, steps, ramps or pavement within the excavation limits and installation of Town-furnished detectable warning tiles for “Concrete Sidewalk Ramp”.

MATERIALS

1. Concrete

- a. The concrete furnished shall conform in respects to composition, transportation, mixing and placing to Class “F” Concrete as specified in Section M.03 of Form 817 or as modified herein.
- b. Test concrete in accordance with AASHTO or ASTM Standard Test Methods as listed herein.
- c. All concrete mixes shall include air entraining and water reducing admixtures and, as needed, a retarder or accelerator. All admixtures must be on the Connecticut DOT approved list.
- d. Entrained air contents shall be maintained as follows:

<u>Nominal Max Aggregate Size</u>	<u>Average Air Content</u>
3/8"	7.5%
1/2"	7.0%
3/4"	6.0%

CONCRETE SIDEWALK AND CONCRETE SIDEWALK RAMPS

A range of $\pm 1.5\%$ from the required average is permissible for field tests.

Slump at the point of placement shall be $4" \pm 1"$.

- e. No additional materials will be added to the concrete mix at the job site without the prior approval of the Engineer.

2. Reinforcing

- a. Welded Wire Mesh: WWM shall be used in all driveways and specified sidewalk locations. The WWM shall be W1.4xW1.4 and conform to the latest AASHTO M 55M/M 55 "Standard Specifications for Welded Steel Wire Fabric for Concrete Reinforcement."

Written requests may be made to substitute synthetic fibers such as Fibermesh or approved equal for welded wire mesh with written approval of the Engineer. The addition rate shall be 1.5 lb/cu yard.

- b. Smooth Metal Dowels: Smooth metal dowels shall be $\frac{5}{8}$ " in diameter and 18 inches in length. All metal dowels shall conform to the requirements of AASHTO M31-92, Grade 60.
- c. Deformed Bars: Deformed bars shall conform to AASHTO M31-92, Grade 60.
- d. Bond breaker shall be Reed Wax #100 Emulsion as manufactured by Roger A. Reed, Inc., Reading, MA (1-781-944-4640) or approved equal.

3. Construction/Isolation Joint Material

Joint material shall be one-half (2) inch in thickness, equal in width to the slab thickness and conform to AASHTO M33, Asphaltic Expansion Joint Materials.

4. Forms

The forms used shall be straight and firmly supported and staked to the line and grades as shown on the plans or as directed 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.

5. Curing Materials

A liquid membrane curing compound such as Masterkure by Master Builders or approved equal and meeting AASHTO M148 shall be applied in accordance with the manufacturer's instructions over the completed concrete surface area.

6. Processed Aggregate Base

Processed aggregate base shall conform to the requirements of "Processed Aggregate Base" elsewhere in these Specifications.

CONCRETE SIDEWALK AND CONCRETE SIDEWALK RAMPS

7. Granite Stone Transition Curb

Granite stone transition curb and associated concrete and mortar shall conform to the requirements of “Granite Stone Curb” elsewhere in these Specifications.

8. Detectable Warning Tiles

Prefabricated detectable warning tiles will be furnished by the Town.

CONSTRUCTION DETAILS

1. Excavation

Excavation, including the removal and disposal of any type of existing sidewalk, curb, ramp, steps or pavement, shall be made to the required depths below the finished grade as shown on the plans or as directed. All soft and yielding material shall be removed and replaced with suitable material.

2. Processed Aggregate Base

The base course shall be placed in layers not to exceed six inches (6”) in depth and to such a depth that after compaction it shall be at the specified depth below the finished grade of the walk.

3. Forms

Forms shall be straight, free from warp and of sufficient strength to resist springing from the pressure of the concrete. Forms shall be of minimum 5” depth and shall have a flat surface on the top. Forms shall be securely staked, braced and held firmly to the required line and grade and shall be sufficiently tight to prevent leakage of mortar. All forms shall be cleaned and oiled or wetted before concrete is placed against them. Sheet metal templates one-eighth ($\frac{1}{8}$) inch in thickness, of the full depth and width of the walk, shall be spaced at intervals of fifteen feet (15’) or as directed by the Engineer. If the concrete is placed in alternate sections, these templates shall remain in place until concrete has been placed on both sides of the template. As soon as the concrete has obtained its initial set, the templates shall be removed.

4. Joints

- a. Construction Joints: At maximum intervals of thirty feet (30’), install a construction joint as detailed on the drawings. Install dowels as shown on the drawings. Minimum embedment on each side of the joints shall be six inches (6”). All dowels shall be straight, square on the ends with no burrs. Locate 12” from the edge of the slab. Bars must be carefully aligned and square with the form face. Prevent bonding to the concrete on one side of the joint by using a plastic sleeve over the dowel or coat with an approved bond breaker. Alternate protected end on each side of the joints.

Dowels are also to be installed between new and existing concrete slabs. Where new or repaired walks abut existing concrete sidewalks, the contractor shall drill

CONCRETE SIDEWALK AND CONCRETE SIDEWALK RAMPS

holes measuring 3/4 of an inch in diameter and twelve (12) inches in depth at 24" on centers into the existing concrete slab. The dowels, dipped in a liquid asphalt and coated with an approved bond breaker or plastic sleeve shall be set into the existing sidewalk slab prior to the placement of concrete. The dowels are to be level with the latitude pitch of the sidewalk and shall conform to the details of these specifications. Any variations in dowel installation procedures must be approved by the Engineer.

Other locations to which dowels may be required will be directed by the Engineer.

- b. **Control Joints**: Follow joint spacing as shown on the drawings. At intervals of approximately fifteen (15) feet, a full control joint shall be provided. A tooled joint, to the depth of 3/8 of an inch, shall be installed at approximately five (5) foot intervals along the sidewalk. The resulting areas should be as square as practical. All joints shall be installed using straight guides set at right angles to the longitudinal direction of the walk.
- c. **Isolation Joints** will be installed wherever concrete is placed against already installed concrete of structures such a curbing, building, or other, previously existing paving.

If it becomes necessary to adjust the locations, horizontal or vertical dimensions of the above listed items due to interference with utilities or for other valid reasons, the Contractor, with the approval of the Engineer, shall construct said items to the modified dimensions and locations.

5. **Concrete Placement and Finishing**

- a. **Subgrade preparation**: The subgrade shall be approved by the Engineer prior to placement of concrete. The grade will be free of soft areas, roots, rubble and large stones. It shall be fully compacted and graded to provide the specified slab thickness within $\pm 1/4$ ".
- b. **Forms**: Align forms as shown on drawings and secure to provide straight edges and uniform curves. Remove only after the concrete has gained sufficient strength to prevent chipping or raveling of the edges.
- c. Where required, install welded wire mesh. Support the mesh on concrete bricks or other supports so that it will remain in the upper third of the slab.
- d. Moisten the subgrade before starting concrete placement to eliminate water loss.
- e. Place continuously, using construction joints at locations shown on the drawings or as approved by the Engineer. If an interruption occurs of a duration that may cause a cold joint, install a construction joint as described in this specification.
- f. Water may be added to the truck mixer to adjust the slump when the discharge begins, only if the concrete is below the specified water cement ratio and maximum slump upon arrival at the job site. Water shall not be added to the batch at any later time. If higher slumps are required, use a high range water reducer such as Rheobuild 1000 by Master Builders or equal as approved by the Engineer.

CONCRETE SIDEWALK AND CONCRETE SIDEWALK RAMPS

- g. Screed the concrete to grade, bull float or darbie, consolidate formed edges by spading with a hand float, and leave until edging can begin. Allow to harden sufficiently so that a foot leaves only a slight imprint. Floating should not begin until the water sheen has disappeared. The surface shall be worked and floated with a wooden, aluminum or magnesium float or finishing machine using float blades. The outside edges of the slab shall be edged with one-quarter (¼) inch radius tool. The slab shall then be broomed crosswise with a fine hair broom leaving the surface free from all tool marks.
 - h. Immediately upon the disappearance of the water sheen following the final finishing and before any marked dehydration or checking occurs, the curing compound shall be applied using an approved spraying device. The sprayer shall deliver a fine spray with uniform coverage. Coverage rate shall be that recommended by the curing compound manufacturer.
 - i. 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. Protect the surface if rain occurs before final set or use for curing in the event of a breakdown of the spray equipment.
 - j. If rain falls on the newly coated sidewalk before the curing film has dried sufficiently to resist damage, or if the film is damaged in any other manner, the contractor shall reapply same. Treated surfaces shall be protected from all foot or vehicular traffic for a sufficient period of time to prevent damage.
 - k. Within 24 hours, spray curing compound on newly poured sidewalks.
6. Reinforcing

Reinforcing of the type specified shall be used in all concrete sidewalk ramps and at concrete sidewalks which cross driveways. Welded wire fabric for concrete reinforcement shall be embedded at mid-depth in the slab.

7. Detectable Warning Tile

All sidewalk ramps shall have detectable warning tiles as shown on the Plan or as directed by the Engineer. The detectable warning tile shall be set directly in poured concrete according to the Plans, the manufacturer's specifications or as directed by the Engineer. The Contractor shall place two 25 pound concrete blocks or sandbags on each tile to prevent the tile from floating after installation in wet concrete. Detectable warning tiles shall be furnished by the Town.

8. Special Conditions

- a. Low Temperature Placements: No concrete is to be placed when air temperature is below 50°F unless additional precautions are taken and prior approval is given by the Engineer. The Engineer must approve all placements below 50°F. No concrete will be placed on frozen sub-grade or at temperatures below 20°F. Concrete exposed to temperatures below 40°F after placement must be protected through the use of insulating blankets, a six (6) inch layer of straw that is

CONCRETE SIDEWALK AND CONCRETE SIDEWALK RAMPS

maintained in a dry condition by a covering of plastic sheeting, or other appropriate methods. Any concrete placed during cold weather that is damaged because of freezing shall be replaced at the Contractor's own expense.

- b. Special consideration for high temperature placements and rapid drying conditions should be discussed with the Engineer. No additional materials will be added to the concrete mix at the job site without the prior approval of the Engineer.
- c. Where reconstruction of an existing approach walk is required, the reconstructed portion of the approach walk shall match the existing approach walk in color, texture and appearance.

9. Curb Transitions

Curb transitions shall be provided when sidewalk ramps are adjacent to existing and proposed curb. Granite stone curb transitions shall be provided adjacent to granite curb and concrete curb transitions shall be provided adjacent to concrete curb and bituminous concrete curb unless approved otherwise by the Engineer.

10. Backfilling and Removal of Surplus Material

The sides of all finished concrete work shall be backfilled to the limits shown on the drawings or as directed by the Engineer, with suitable material thoroughly compacted and finished flush with the top of the concrete. All surplus material shall be removed and the site left in a neat and presentable condition to the satisfaction of the Engineer.

11. Protection

The Contractor shall protect newly poured concrete surfaces so as to prevent damage from falling objects, vandalism, etc. The Contractor shall repair or remove and replace any damaged or defaced concrete surface at his own expense. Determination to repair or remove and replace will be at the sole discretion of the Engineer.

12. Utility Adjustments

If an existing utility box, valve box or manhole is located within the limits of the new sidewalk or ramp, the Contractor shall be responsible for the coordination and scheduling with the owner of the facility, for the adjustment of the facility to grade, if necessary.

13. Signs

Unless otherwise shown on the Plan or directed by the Engineer, the Contractor shall remove existing signs located within the limits of the sidewalk or ramp construction, erect them on temporary support posts during the construction of new sidewalk or ramp, and reinstall them at their original location in a PVC sleeve set flush to the grade of the new sidewalk.

MEASUREMENT

CONCRETE SIDEWALK AND CONCRETE SIDEWALK RAMPS

“Concrete Sidewalk” will be measured by the actual number of square feet of completed and accepted concrete sidewalk of the thickness specified.

“Concrete Sidewalk and Curb Monolithic” will be measured by the actual number of square feet of completed and accepted concrete sidewalk of the thickness specified measured from face of curb to back of walk.

“Reinforced Concrete Sidewalk” will be measured by the actual number of square feet of completed and accepted reinforced concrete sidewalk of the thickness specified.

“Concrete Sidewalk Ramps” will be measured by the actual number of square feet of completed and accepted concrete ramps of the thickness specified.

The following items will not be measured separately for payment, but shall be considered as included in the unit price bid for “Concrete Sidewalk”, “Reinforced Concrete Sidewalk”, “Concrete Sidewalk and Curb Monolithic” or “Concrete Sidewalk Ramp” of the thickness specified:

1. Excavation and backfill;
2. Furnishing and installing processed aggregate base;
3. Forming and compacting of subgrade;
4. Expansion joint material, dowels and other reinforcement;
5. Sawcutting and removal of existing sidewalks, ramps and/or bituminous concrete pavement within the limits of the new sidewalk or ramp;
6. Installing Town-furnished detectable warning tiles;
7. Installing curb transitions;
8. Adjustment of existing valve boxes, utility boxes, or handholes to grade;
9. Removing, temporarily erecting and re-installing existing signs within the limits of new sidewalk or ramps;
10. Cast-in-place concrete curbing associated with sidewalk ramps;

PAYMENT

This work will be paid for at the contract unit price per square foot for “Concrete Sidewalk”, “Reinforced Concrete Sidewalk”, “Concrete Sidewalk and Curb Monolithic” or “Concrete Sidewalk Ramp”, of the thickness specified, complete in place, which prices shall include all excavation; formation of subgrade; sawcutting, removal and disposal of existing sidewalk, ramps and pavement; processed aggregate base; concrete curb transitions; backfill, reinforcement, expansion joints, curing, disposal of surplus material, installation of detectable warning tiles, relocation and temporary support of existing signs, equipment, tools, materials and labor incidental thereto.

Granular fill used to replace unsuitable material or used as borrow material to bring the sidewalk subbase to grade will be paid under the item “Granular Fill” elsewhere in these Specifications. Granular fill will only be paid for if directed by the Engineer.

CONCRETE SIDEWALK AND CONCRETE SIDEWALK RAMPS

Pay Item

4" Concrete Sidewalk
5" Concrete Sidewalk

Pay Unit

Square Foot
Square Foot

REMOVE CONCRETE SIDEWALK

DESCRIPTION

“Remove Concrete Sidewalk” includes the removal and disposal of all existing concrete sidewalks and concrete curb **outside the limits of new concrete sidewalk or bituminous concrete roadway**. This item is generally only used when sidewalk is being permanently removed.

MATERIALS

Not applicable.

CONSTRUCTION DETAILS

The removal of concrete sidewalks and concrete curb shall be made in conformity with the requirements of the plans and as ordered by the Engineer. All concrete, reinforcing, dowels, forms and joint material shall be removed. The base material, if any, may remain in place if the required depth for the materials to be placed in that area is provided. All existing sidewalks and driveways, which are designated to remain, shall be sawcut at the contract limits or the nearest joint as directed by the Engineer. Sawcut edges shall be protected during construction. Any edges damaged shall be recut and any material required to be placed in that area shall not be measured for payment.

The Contractor shall protect all existing trees, shrubs and landscaping, fences, mailboxes, utility poles, signs, sidewalks, driveways and pavements that are to remain. The Contractor shall repair, reset or replace these items as designated by the Engineer at no additional cost. Track type vehicles shall not be allowed on existing pavement areas. Any disturbance of lawn areas outside of the construction limits shall be restored to pre-construction condition and shall not be measured for payment.

All materials removed for this project shall be disposed of in accordance with all applicable regulations. No stockpiling of removed material shall be allowed on site.

Access to all private properties shall be maintained at all times, including providing temporary processed aggregate driveways as directed by the Engineer. Temporary driveways shall be provided at no additional cost to the Town of Manchester.

MEASUREMENT

Payment for “Remove Concrete Sidewalk” shall be for the actual number of square yards of concrete sidewalk and concrete curb removed and properly disposed of, as shown on the plans or as directed by the Engineer. Payment limits for “Remove Concrete Sidewalk” shall be outside of the limits of new concrete sidewalk or bituminous concrete roadway; the removal of existing sidewalk within the limits of new concrete sidewalk or roadway shall be considered as included in the unit price as specified for those respective items.

REMOVE CONCRETE SIDEWALK

The pay limits of “Remove Concrete Sidewalk” shall be measured in place with the Engineer prior to removal. Any material removed prior to measurement shall not be considered for payment.

The sawcutting of existing sidewalks and driveways shall not be measured for payment.

PAYMENT

“Remove Concrete Sidewalk” will be paid for within the pay limits specified at the contract unit price per square yard and shall include the furnishing of all tools, equipment, materials and labor necessary to complete the work as specified on the Plans or directed by the Engineer as measured under the methods described above.

Sawcutting of existing sidewalks and driveways will not be paid for separately, but shall be included in the cost of this or other items.

<u>Pay Item</u>	<u>Pay Unit</u>
Remove Concrete Sidewalk	Square Yard

CONCRETE DRIVEWAY APRON

DESCRIPTION

“(Size) Concrete Driveway Apron” includes the construction of concrete driveways and concrete driveway aprons on a prepared processed aggregate base in the locations and to the dimensions and details shown on the Plans, as directed by the Engineer, and in accordance with these Specifications.

MATERIALS

Portland cement, fine and coarse aggregate, air-entraining admixtures and water shall conform to the requirements of Section M.03.01 of Form 817 for Class “F” Concrete.

Processed aggregate base shall conform to the requirements of “Processed Aggregate Base” elsewhere in these Specifications.

Reinforcement shall conform to the requirements of Section M.06.01 of Form 817 for concrete pavement.

Granite stone transition curb and associated concrete and mortar shall conform to the requirements of “Granite Stone Curb” elsewhere in these Specifications.

CONSTRUCTION DETAILS

Construction methods shall conform to the requirement of the Item, “Concrete Sidewalk and Concrete Sidewalk Ramps”. The surface shall be finished and marked off as directed. The driveways shall be reinforced as indicated on the Plans. The concrete shall contain not less than five (5) nor more the seven (7) percent entrained air at the time the concrete is deposited in the forms.

The Contractor shall sawcut the existing pavement and excavate as necessary to perform the work under this item as shown on the Plans.

Curb transitions shall be provided when concrete driveway aprons are adjacent to existing and proposed curb. Granite stone curb transitions shall be provided adjacent to granite curb and concrete curb transitions shall be provided adjacent to concrete curb and bituminous concrete curb unless approved otherwise by the Engineer.

MEASUREMENT

“(Size) Concrete Driveway Apron” will be measured for payment by the actual number of square feet of completed and accepted concrete driveway and concrete driveway apron.

The following items will not be measured separately for payment, but shall be considered as included in the unit price bid for “Concrete Driveway Apron”:

1. Excavation
2. Sawcutting of existing concrete or bituminous surface
3. Processed Aggregate Base

CONCRETE DRIVEWAY APRON

4. Curb transitions
5. Dowels and other reinforcement
6. Removal of existing sidewalks, ramps, driveway or roadway within the driveway excavation limits

PAYMENT

This work will be paid for at the contract unit price per square foot for “(Size) Concrete Driveway Apron” of the type specified, complete in place, which price shall include excavation, sawcutting, removal and disposal of existing driveway and/or sidewalk, concrete, reinforcement, granite stone or concrete curb transitions, formation of subgrade and all materials, equipment, tools and labor incidental thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
6” Concrete Driveway Apron	Square Foot
8” Concrete Driveway Apron	Square Foot

EXTRUDED CONCRETE CURB

DESCRIPTION

“Extruded Concrete Curb” of the type specified includes the furnishing and installation of slip formed concrete curbing placed on a prepared bituminous concrete pavement in accordance with the dimensions and details shown on the Plans or as directed by the Engineer.

MATERIALS

Concrete: Furnished concrete shall conform to Class “PCC04460” Concrete as specified in Article M.03.02 of Form 818 or as modified herein with respect to composition, transportation, mixing and placing. Concrete shall contain a minimum of one pound of fiber reinforcement per cubic yard. All concrete shall be produced in accordance with ASTM C94 Ready Mixed Concrete.

Adhesive: Adhesive shall be based upon the manufacturer’s recommendation for the intended installation.

CONSTRUCTION DETAILS

Concrete shall be of such consistency that, after extrusion, it will maintain the shape of the curb section without support or slumping. It shall have a clean, uniform appearance, free from surface pits larger than 3/16” in diameter.

The pavement surface shall be thoroughly cleaned using high pressure washing, if necessary, prior to curb installation.

The curb shall be bonded to the base course of pavement with an approved concrete to asphalt adhesive or a two-component epoxy in accordance with the manufacturer’s instructions.

The top of the finished curb shall be true to line and shall follow the contour of the pavement.

Control joints shall be cut, as soon as possible, through one-third of the cross section of concrete. The joint shall be tooled and finished to a neat and uniform appearance. Control joints shall be installed at nine foot (9’) intervals on tangent sections and three foot (3’) intervals on radii.

Where extruded concrete curb is shown to be installed over a concrete catch basin top, control joints shall be installed on each side of the catch basin top.

The finished curb shall be coated with a curing compound, designed to seal the surface and form a water proofing membrane to retard the loss of water from the fresh concrete.

After the completion of curbing, traffic shall be kept at a safe distance for a period of not less than 24 hours and until the curbing has set sufficiently to prevent damage to the work. Fill material shall be placed behind the curb immediately thereafter.

EXTRUDED CONCRETE CURB

MEASUREMENT

“Extruded Concrete Curb” of the type specified will be measured for payment along the top of the curb and will be the actual number of linear feet of extruded concrete curbing, completed and accepted.

The following will not be measured for payment, but shall be considered as included in the unit price bid for “Extruded Concrete Curb”:

1. Surface cleaning and preparation of existing bituminous concrete pavement
2. Adhesive
3. Curing compound
4. Control joints

PAYMENT

Payment for this work will be made at the contract unit price per linear foot for “Extruded Concrete Curb” of the type specified complete in place, which price shall include the removal and disposal of existing curb, the cleaning and surface preparation of existing bituminous concrete pavement, adhesive, curing compound, all materials, equipment, tools and labor incidental thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
Extruded Concrete Curb	Linear Foot
Mountable Extruded Concrete Curb	Linear Foot

BITUMINOUS CONCRETE CURB

DESCRIPTION

“Bituminous Concrete Curb” of the type specified includes the furnishing and installation of machine laid bituminous concrete, constructed on a prepared bituminous concrete pavement to the dimensions and details shown on the Plans, or as directed by the Engineer, and in conformity with the Specifications.

MATERIALS

All materials for this work, including tack coat, shall meet the requirements of Section M.04, curb mix, of Form 817.

CONSTRUCTION DETAILS

The methods employed in performing the work and all equipment, tools machinery and plant used in handling material and executing any part of the work shall be subject to the approval of the Engineer before the work is started, and whenever found unsatisfactory, it shall be changed and improved as required by the Engineer. All equipment, tools, machinery and plant used must be maintained in a satisfactory working condition. The curbing shall be constructed in accordance with the following requirements:

Prior to the arrival of the mixture on the work, the surface of the pavement where the curbing is to be constructed shall be cleaned of all loose and foreign material. The surface, which shall be perfectly dry and clean at the time the mix is placed, shall be coated with an approved bitumen tack coat just prior to placing the mixture.

On arrival at the site, the mixture shall be transferred from the truck to the hopper of the curbing machine; and the mixture shall be kept clean and free from dirt or foreign materials at all times.

The surface of the curbing shall be tested with a 10-foot straight-edge, and any variation from a true line exceeding one-quarter of an inch ($\frac{1}{4}$ ") shall be satisfactorily corrected. The only compaction required shall be that obtained by the approved mechanical curbing machine.

Where machine work is impractical, the Engineer may permit hand laid curbing to be constructed.

If the design of the curbing machine is such that the outside wheels operate outside of the curb, the Contractor will be required to obtain a smooth surface by grading and consolidating the area on which the outside wheel of the machine rides, and this work shall be done at his expense. After the completion of curbing, traffic shall be kept at a safe distance for a period of not less than 24 hours and until the curbing has set sufficiently to prevent damage to the work. Fill material will be placed behind the curb immediately thereafter.

MEASUREMENT

“Bituminous Concrete Curb” of the type specified will be measured for payment by the actual number of linear feet of bituminous concrete lip curb, measured along the top of the curb,

BITUMINOUS CONCRETE CURB

completed and accepted.

The following will not be measured separately for payment, but shall be considered as included in the unit price bid for "Bituminous Concrete Curb" of the type specified:

1. Removal and disposal of existing curb
2. Surface cleaning and preparation of existing bituminous concrete surface
3. Tack Coat

PAYMENT

This work will be paid for at the contract unit price per linear foot for "Bituminous Concrete Curb" of the type specified, complete in place, which price shall include the removal and disposal of existing curb, the cleaning and preparation of existing bituminous concrete roadway, and all materials, equipment, tools and labor incidental thereto.

Pay Item

Bituminous Concrete Lip Curb

Pay Unit

Linear Foot

GRANITE STONE CURB

DESCRIPTION

“Granite Stone Curb” and “Radius Granite Stone Curb” includes the furnishing and installing of straight or curved granite stone curb on a prepared base at the location and to the details shown on the Plans or as directed by the Engineer and in accordance with these Specifications.

“Reset Granite Stone Curb” includes the removal of existing granite stone curb and the resetting of the curb at a new location on a prepared base in accordance with the details shown on the Plans or as directed by the Engineer and in accordance with these Specifications. This work includes reset of both straight and radius granite stone curb.

“Trim and Cut Granite Stone Curb” includes the sawcutting of existing granite stone curb as required to match new curb, sidewalk or apron to existing or where directed by the Engineer. It shall not include the sawcutting of new granite stone curb sections.

“Remove Granite Stone Curb” includes the removal of existing granite stone curb where shown on the Plans or as directed by the Engineer and in accordance with these Specifications. This work includes removal of both straight and radius granite stone curb and return of such curb to the Town when requested.

MATERIALS

All curbing material shall be created from hard and durable granite, light gray in color, free from seams which impair its structural integrity, and of a smooth splitting character. Natural color variations characteristic of the deposit will be permitted. Granite shall come from approved quarries acceptable to the Engineer.

1. Curved Granite Curb

Type V 6 x 18 curbstones set on a radius of one hundred (100) feet or less shall be cut to the curve required.

All radius granite stone curb shall be set in a subbase of Class "C" concrete.

2. Straight Granite Stone Curb

Straight Granite Stone Curb shall be cut to the following dimensions:

<u>Type</u>	<u>Width At Top, Inches</u>	<u>Depth, Inches</u>	<u>Minimum Length, Feet</u>	<u>Minimum Width At Bot. Inches</u>
V 5 x 18	5	18"-22"	4	5

Straight granite curb shall be set in a subbase of Class “C” concrete at the joints only.

3. Mortar

GRANITE STONE CURB

Mortar for pointing joints shall conform to Section M.11.04 of Form 817.

4. Concrete

Class 'C' Concrete shall conform to Section M.03.01 of Form 817.

5. Processed Aggregate Base

Processed Aggregate Base shall conform to the material requirements of the item "Processed Aggregate Base" elsewhere in these Specifications.

CONSTRUCTION DETAILS

1. Delivery

All granite curb shall be accepted by the Town at the time of delivery and prior to installation.

2. Excavation

Excavation shall be made of sufficient depth and width to accommodate the processed aggregate base as shown on the Plans. The processed aggregate base shall be compacted to a firm, even surface and shall be approved by the Engineer.

3. Transition Sections

Roadway Transitions: A six foot (6') transition section of granite curb shall be installed at all end sections that do not match to other types of curbing. The end section shall match flush with the existing edge of the pavement or the top of adjacent existing curb.

Driveway Transitions: All transition sections of granite curbing along driveways shall be set in Class "C" concrete and meet the requirements of the Plans.

4. Backfilling

After all curb is set, the space between it and the wall of the trench shall be backfilled with processed aggregate base material thoroughly tamped to the depth directed, care being taken not to affect the line or grade of the curb. All curbing shall be properly installed and backfilled prior to the placement of the bituminous concrete pavement.

All radius granite stone curbing shall be set in Class "C" concrete as shown on the Plans.

5. Protection

The contractor shall protect all curbing until completion and acceptance.

GRANITE STONE CURB

6. Joints

The maximum joint openings between sections of curbing shall not exceed ½ inch over the entire width of the exposed curb.

Joints are to be mortared to the full depth and width of the curb, and all excess mortar wiped clean off face of curb. At intervals of fifty feet (50'), one joint shall be left open for expansion purposes.

Joints in straight granite curb sections shall be set in a subbase of Class "C" concrete as shown on the Plan or as directed by the Engineer.

7. Removal

The removal of granite curb shall be made in conformity with the requirements of the plans and as ordered by the Engineer. All concrete, dowels, forms and joint material shall be removed. The base material, if any, may remain in place if the required depth for the materials to be placed in that area is provided. All existing curb which is designated to remain, shall be sawcut at the contract limits or the nearest joint as directed by the Engineer. Sawcut edges shall be protected during construction. Any edges damaged shall be recut and any material required to be placed in that area shall not be measured for payment.

Unless directed otherwise by the Engineer, granite stone curb removed for this project shall be disposed of in accordance with all applicable regulations. No stockpiling of removed material shall be allowed on site.

MEASUREMENT

"Granite Stone Curb" and "Radius Granite Stone Curb" will be measured for payment by the actual number of linear feet of granite stone curbing or curved granite stone curbing, installed and accepted. Measurement shall be made along the top axis line of face of curb. Curbing set on a radius of 100 feet or less will be measured for payment as "Radius Granite Stone Curb".

Transition curbing will be measured for payment as "Granite Stone Curb" or as "Radius Granite Stone Curb" as the case may be.

"Reset Granite Stone Curb" will be measured for payment by the actual number of linear feet of existing granite stone curbing, installed and accepted. Measurement shall be made along the top axis line of face of curb.

"Trim and Cut Granite Stone Curb" will be measured for payment by the actual number of linear feet of granite stone curb sawcut. Measurement shall be made along the face of curb. The sawcutting of new granite stone curb required to fit to the locations shown on the Plans will not be measured for payment, but its costs shall be included in the item "Granite Stone Curb" or

GRANITE STONE CURB

“Radius Granite Stone Curb”.

“Remove Concrete Curb” will be measured for payment by the actual number of linear feet of granite stone curb removed and properly disposed of, as shown on the plans or as directed by the Engineer. The pay limits shall be measured in place with the Engineer prior to removal. Any material removed prior to measurement shall not be considered for payment. The sawcutting of existing curb to be removed will not be measured separately for payment, , but its costs shall be included in the item “Remove Granite Stone Curb”.

The following will not be measured for payment, but shall be considered as included in the unit price bid for “Granite Stone Curb”, “Curved Granite Stone Curb”, “Reset Granite Stone Curb”, “Trim and Cut Granite Stone Curb” and “Remove Granite Stone Curb”:

1. Excavation
2. Removal and disposal of existing curb
3. Removal and disposal of existing roadway within excavation limits of new curb
4. Removal and disposal of existing concrete around curb (for reset curb)
5. Concrete for granite curb subbase
6. Processed Aggregate Base
7. Mortar or Joint Sealant

PAYMENT

Payment for this work will be made at the contract unit price per linear foot for “Granite Stone Curb”, “Radius Granite Stone Curb”, “Trim and Cut Granite Stone Curb” or “Remove Granite Stone Curb”, complete in place. The prices shall include all sawcutting, removal and disposal of existing curb and/or bituminous concrete; all excavation as shown on the Plans, granite stone curbing, granite stone transition curbing, processed aggregate base, pointing, Class “C” concrete, backfilling, compaction, disposal of all surplus material, equipment, tools and labor incidental thereto. Unless specified otherwise, sawcutting of existing curb to be removed will not be paid for separately, but shall be included in the cost of this or other items.

Payment for resetting existing granite stone curbing will be made at the contract unit price per linear foot of “Reset Granite Stone Curb”, complete in place. The price shall include all sawcutting, removal and disposal of existing bituminous concrete; all excavation as shown on the Plans, processed aggregate base, pointing, Class “C” concrete, backfilling, removal of concrete around existing curb, compaction, disposal of all surplus material, equipment, tools and labor incidental thereto.

Pay Item

Granite Stone Curb
Reset Granite Stone Curb

Pay Unit

Linear Foot
Linear Foot

CUT CONCRETE PAVEMENT

DESCRIPTION

“Cut Concrete Pavement” includes the sawcutting of existing concrete pavement at locations shown on the plans or as directed by the Engineer.

MATERIALS

Not applicable.

CONSTRUCTION DETAILS

The existing concrete pavement shall be sawcut to a neat, straight line at the locations shown on the plans to a depth suitable to remove the pavement without damage to the adjacent pavement to remain.

MEASUREMENT

“Cut Concrete Pavement” will be measured for payment by the actual linear feet of cut made to the lines delineated on the plans or as directed by the Engineer.

PAYMENT

This item will be paid for at the contract unit price per linear foot for "Cut Concrete Pavement" complete in place, which price shall include all materials, equipment, tools and labor incidental thereto.

Pay Item

Cut Concrete Pavement

Pay Unit

Linear Foot

REMOVE CONCRETE ROAD BASE

DESCRIPTION

“Remove Concrete Road Base” shall consist of the removal and disposal of existing reinforced concrete at the locations shown on the Plans or where directed by the Engineer.

MATERIALS

Not applicable

CONSTRUCTION DETAILS

The Contractor shall sawcut to the limits of concrete to be removed with a cutting saw. The saw cut shall be vertical and in straight lines. The existing concrete shall be completely removed down to existing base material. Care shall be taken to protect existing utility structures within the area of concrete removal. Existing concrete shall become the property of the Contractor and be disposed of in accordance with federal, state and local regulations.

MEASUREMENT

“Remove Concrete Road Base” will be measured for payment by the actual number of square yards of existing concrete, regardless of thickness, removed in accordance with the Plans or where directed by the Engineer.

PAYMENT

This work will be paid for at the contract unit price per square yard for “Remove Concrete Road Base”, complete, to the limits and dimensions as shown on the plans and details, including all material, labor, tools and equipment incidental to the completion of the work.

Pay Item

Remove Concrete Road Base

Pay Unit

Square Yard

MISCELLANEOUS CONCRETE

DESCRIPTION

“Miscellaneous Concrete” includes the construction of concrete pipe encasements, concrete pipe cradles or other concrete structures on granular fill in the locations and to the dimensions and details shown on the Plans, as directed by the Engineer, and in accordance with these Specifications.

MATERIALS

Portland cement, fine and coarse aggregate, air-entraining admixtures and water shall conform to the requirements of Article M.03.01 of Form 817 for Class “A” Concrete.

Granular fill shall conform to the requirements of “Granular Fill” elsewhere in these Specifications.

Reinforcement shall conform to the requirements of Article M.06.01 of Form 817.

Smooth metal dowels shall be $\frac{5}{8}$ " in diameter and 18 inches in length. All metal dowels shall conform to the requirements of AASHTO M31-92, Grade 60.

Bond breaker shall be Reed Wax #100 Emulsion as manufactured by Roger A. Reed, Inc., Reading, MA (1-781-944-4640) or approved equal.

Epoxy shall be Ultrabond 1 as manufactured by Adhesive Technologies Corp., Pompano Beach, FL (1-800-892-1880) or approved equal

CONSTRUCTION METHODS

1. Excavation

Excavation, including the removal and disposal of any type of existing sidewalk, curb, ramp, steps or roadway, shall be made to the required depths below the finished grade as shown on the plans or as directed. All soft and yielding material shall be removed and replaced with suitable material.

2. Granular Fill

The base course shall be placed in layers not to exceed six (6) inches in depth and to such a depth that after compaction it shall be at the specified depth below the finished grade of the concrete.

3. Forms

Forms shall be straight, free from warp and of sufficient strength to resist springing from the pressure of the concrete. They shall be of approved section and shall have a flat surface on the top. Forms shall be securely staked, braced and held firmly to the required line and grade and shall be sufficiently tight to prevent leakage of mortar. All forms shall be cleaned and oiled or wetted before concrete is placed against them. Sheet metal

MISCELLANEOUS CONCRETE

templates one-eighth ($\frac{1}{8}$) inch in thickness, of the full depth and width of the walk, shall be spaced at intervals of fifteen feet (15') or as directed by the Engineer. If the concrete is placed in alternate sections, these templates shall remain in place until concrete has been placed on both sides of the template. As soon as the concrete has obtained its initial set, the templates shall be removed.

4. Joints

- a. Construction Joints: Install dowels as shown on the drawings. Minimum embedment on each side of the joints shall be six inches (6"). All dowels shall be straight, square on the ends with no burrs. Locate at the center of the slab on 12" centers or as noted on the Plans. Bars must be carefully aligned and square with the form face.

When allowances for expansion and contraction of joints is required or when directed by the Engineer, the Contractor shall prevent bonding to the concrete on one side of the joint by using a plastic sleeve over the smooth metal dowel or coat with an approved bondbreaker. Alternate protected end on each side of the joints. For joints between new and existing concrete, the contractor shall drill holes measuring $\frac{3}{4}$ of an inch in diameter or as required. The smooth metal dowels shall be dipped in a liquid asphalt and coated with an approved bond breaker or plastic sleeve and shall be set into the existing concrete prior to the placement of new concrete. The dowels are to be level with the latitude pitch of the existing concrete and shall conform to the details of these specifications. Any variations in dowel installation procedures must be approved by the Engineer.

When no expansion and contraction of the joint is desired (such as extension of existing concrete walls) or when directed by the Engineer, the dowels do not need to be smooth and installation of plastic sleeves or bond breaker is not required. For joints between new and existing concrete, the contractor shall drill holes measuring $\frac{3}{4}$ of an inch in diameter or as required and install epoxy for placement of dowels into the existing concrete prior to the placement of new concrete. The dowels are to be level with the latitude pitch of the existing concrete and shall conform to the details of these specifications. Any variations in dowel installation procedures must be approved by the Engineer.

Other locations to which dowels may be required will be directed by the Engineer.

- b. Control Joints: Follow joint spacing as shown on the drawings. Joints should be as square as practical. All joints shall be installed using straight guides set at right angles to the longitudinal direction of the concrete edges.
- c. Isolation Joints will be installed wherever concrete is placed against already installed concrete of structures such a curbing, building, or other, previously existing paving.

MISCELLANEOUS CONCRETE

5. Concrete Placement and Finishing

- a. Subgrade preparation: The subgrade shall be approved by the Engineer prior to placement of concrete. The grade will be free of soft areas, roots, rubble and large stones. It shall be fully compacted and graded to provide the specified concrete thickness within $\pm 1/4$ ".
- b. Forms: Align forms as shown on drawings and secure to provide straight edges and uniform curves. Remove only after the concrete has gained sufficient strength to prevent chipping or raveling of the edges.
- c. Where required, install welded wire mesh. Support the mesh on concrete bricks or other supports so that it will remain in the upper third of the slab.
- d. Moisten the subgrade before starting concrete placement to eliminate water loss
- e. Place continuously, using construction joints at locations shown on the drawings or as approved by the Engineer. If an interruption occurs of a duration that may cause a cold joint, install a construction joint as described in this specification.
- f. Water may be added to the truck mixer to adjust the slump when the discharge begins, only if the concrete is below the specified water cement ratio and maximum slump upon arrival at the job site. Water shall not be added to the batch at any later time. If higher slumps are required, use a high range water reducer such as Rheobuild 1000 by Master Builders or equal as approved by the Engineer.
- g. Screed the concrete to grade, bull float or darbie, consolidate formed edges by spading with a hand float, and leave until edging can begin if required as directed by the Engineer. Allow to harden sufficiently so that a foot leaves only a slight imprint. Floating should not begin until the water sheen has disappeared. The surface shall be worked and floated with a wooden, aluminum or magnesium float or finishing machine using float blades. The outside edges of the slab shall be edged with one-quarter (1/4) inch radius tool.

The slab shall then be broomed crosswise with a fine hair broom leaving the surface free from all tool marks.

- h. Immediately upon the disappearance of the water sheen following the final finishing and before any marked dehydration or checking occurs, the curing compound shall be applied using an approved spraying device. The sprayer shall deliver a fine spray with uniform coverage. Coverage rate shall be that recommended by the curing compound manufacturer.
- i. 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. Protect the

MISCELLANEOUS CONCRETE

surface if rain occurs before final set or use for curing in the event of a breakdown of the spray equipment.

- j. If rain falls on the newly poured concrete before the curing film has dried sufficiently to resist damage, or if the film is damaged in any other manner, the contractor shall reapply same. Treated surfaces shall be protected from all foot or vehicular traffic for a sufficient period of time to prevent damage.

6. Reinforcing

Reinforcing of the type specified shall be used as specified on the Plans. Welded Wire Fabric for concrete reinforcement shall be embedded at mid-depth in the slab.

7. Special Conditions

- a. Low Temperature Placements: No concrete is to be placed when air temperature is below 50°F unless additional precautions are taken and prior approval is given by the Engineer. The Engineer must approve all placements below 50°F. No concrete will be placed on frozen sub-grade or at temperatures below 20°F. Concrete exposed to temperatures below 40°F after placement must be protected through the use of insulating blankets, a six (6) inch layer of straw that is maintained in a dry condition by a covering of plastic sheeting, or other appropriate methods. Any concrete placed during cold weather that is damaged because of freezing shall be replaced at the Contractor's own expense.
- b. Special consideration for high temperature placements and rapid drying conditions should be discussed with the Engineer. No additional materials will be added to the concrete mix at the job site without the prior approval of the Engineer.
- c. Where reconstruction of existing concrete exposed at the surface is required, the reconstructed portion of the concrete shall match the existing concrete in color, texture and appearance.

8. Backfilling and Removal of Surplus Material

The sides of all finished concrete work shall be backfilled to the limits shown on the drawings or as directed by the Engineer, with suitable material thoroughly compacted and finished flush with the top of the concrete. All surplus material shall be removed and the site left in a neat and presentable condition to the satisfaction of the Engineer.

9. Protection

The Contractor shall protect newly poured concrete surfaces so as to prevent damage from falling objects, vandalism, etc. The Contractor shall repair or remove and replace any damaged or defaced concrete surface at his own expense. Determination to repair or remove and replace will be at the sole discretion of the Engineer.

MISCELLANEOUS CONCRETE

10. Utility Adjustments

If an existing utility box, valve box or manhole is located within the limits of the new concrete, the Contractor shall be responsible for the coordination and scheduling with the owner of the facility, for the adjustment of the facility to grade, if necessary.

The concrete shall contain not less than five (5) percent or more the seven (7) percent entrained air at the time the concrete is deposited in the forms.

The Contractor shall sawcut existing concrete and pavement and excavate as necessary to perform the work under this item as shown on the Plans.

If it becomes necessary to adjust the locations, horizontal or vertical dimensions of the work due to interference with utilities or for other valid reasons, the Contractor, with the approval of the Engineer, shall construct said items to the modified dimensions and locations.

MEASUREMENT

“Miscellaneous Concrete” will be measured for payment by the actual number of cubic yards of completed and accepted concrete installation.

The following items will not be measured separately for payment, but shall be considered as included in the unit price bid for “Miscellaneous Concrete”:

1. Excavation
2. Granular Fill
3. Dowels and other reinforcement
4. Removal of existing sidewalks, ramps, driveway or roadway within the excavation limits

PAYMENT

This work will be paid for at the contract unit price per cubic yard for “Miscellaneous Concrete” of the type specified, complete in place, which price shall include excavation, removal and disposal of existing sidewalk, ramps, driveway and/or roadway, concrete, reinforcement, formation of subgrade, gravel fill, and all materials, equipment, tools and labor to complete the work as specified on the Plans or as directed by the Engineer.

Pay Item

Miscellaneous Concrete

Pay Unit

Cubic Yard

CULVERTS

DESCRIPTION

“Culvert” of the size and type specified includes the furnishing and installing of new pipe culverts and/or relaying existing pipe culverts of the type, size and length called for on the Plans at the locations and to the lines and grades designated on the Plans, or as directed by the Engineer. This item includes other incidental work associated with the installation of pipe culverts, including trench excavation, stockpiling and placement of approved native material as backfill, disposal of native material, furnishing and installing granular fill bedding material, trench support systems, making connections to existing culverts, modifying existing structures to accommodate new pipe, and trench backfilling to the lines and grades designated on the Plans, or as directed by the Engineer.

“Culvert End” of the size and type specified includes the furnishing and installing of new culvert ends at the locations and to the lines and grades designated on the Plans, or as directed by the Engineer, and in conformity with these Specifications. This item includes other incidental work associated with the installation of culvert ends, including excavation, furnishing and compaction of bedding material, and connecting to existing culverts.

“Plug Pipe” shall consist of the plugging of existing pipes with cement masonry where shown on the Plans or as directed by the Engineer.

“Abandon Pipe” shall consist of the abandonment of existing pipes by bulkheading both ends and filling the remainder of the pipe with flowable concrete.

“Remove Pipe” shall consist of the removal and disposal of existing pipes and the proper backfilling of the associated trench. Only pipes called out on the plans to be removed will be measured and paid for under this item. Existing pipes to be removed that fall within the excavation limits of new pipe will not be measured separately for payment, but shall be considered as included in the unit price bid for the new pipe.

MATERIALS

Reinforced Concrete Pipe shall conform to Section M.08.01.07 of Form 817. Joint sealant shall conform to the requirements of Section M.08.01.17, “Flexible, Watertight, Rubber-Type Gaskets”. Portland cement mortar or bituminous sealers shall not be used for sealing pipe joints.

High density polyethylene (H.D.P.E.) pipe and flared ends shall have a smooth interior and conform to requirements for Corrugated Polyethylene Pipe in Section M.08.01.18 of Form 817.

Ductile iron pipe shall meet the requirements of the latest revision of AWWA C151 (ANSI A21.51). Joint restraints are not required and all joints shall be rubber gasket push-on type manufactured in accordance with the latest revision of AWWA C111 (ANSI A21.11). Pipe shall be supplied with the standard exterior bituminous coating of either coal tar or asphalt base approximately one mil thick. The interior shall be double cement lined in accordance with the latest revision of AWWA C104 (ANSI A21.4), and pipe shall be of thickness Class 52 unless otherwise indicated. Pipe shall be manufactured by American Pipe, Griffin, U.S. Pipe, McWane

CULVERTS

Ductile or approved equal.

Reinforced concrete culvert ends (R.C.C.E.) shall conform to Section M.08.01.11 of Form 817.

Bedding material for reinforced concrete pipe shall conform to the requirements of Section M.08.03 of Form 817.

Bedding material for plastic pipe shall be granular fill that conforms to the requirements of Section M.02.01 of Form 817.

Class "A" Concrete shall conform to the requirements of Article M.03.01 of the Form 817.

Flowable concrete fill used for abandoning pipelines shall be excavatable with a maximum 28-day compressive strength of 150 psi. Concrete mix design shall be submitted to the Engineer for review and approval.

Granular fill shall conform to the requirements of the specification "Granular Fill" elsewhere in these Specifications.

Processed Aggregate Base shall conform to the requirements of the specification "Processed Aggregate Base" elsewhere in these Specifications.

Steel sheeting for trench stabilization, if required, shall conform to the requirements of ASTM A328, ASTM A572 or ASTM A690 as appropriate.

CONSTRUCTION DETAILS

Unless otherwise directed by the Engineer, all new or relaid pipe culverts shall be installed in bedding material in accordance with the details and these specifications.

Pipe with an internal diameter of less than 48 inches, including pipe-arch of an equivalent horizontal span, shall be installed in a Type I installation. All plastic pipe and other pipe materials of 48 inches internal diameter or more, including pipe-arch of equivalent horizontal span, shall be installed in a Type II installation.

Type I installation shall consist of installing the pipe, or pipe-arch, in bedding material with a thickness directly under the pipe of four (4) inches (12 inches in rock) and pre-shaped to a height of ten (10) percent of the total height of the pipe. After the pipe has been installed, the trench shall be backfilled with bedding material to a height of twenty-five (25) percent of the total height of the pipe.

Type II installation shall consist of installing the pipe or pipe-arch in bedding material, with a thickness directly under the pipe of four (4) inches (12 inches in rock) and pre-shaped to a height of ten (10) percent of the total height of the pipe. After the pipe has been installed, the trench shall be backfilled with bedding material to a minimum height of twelve (12) inches above the top of the pipe.

CULVERTS

Reinforced concrete pipe shall be Class IV with a minimum cover of 2 feet. Class V reinforced concrete pipe shall be installed in locations where 1.5 to 2 feet of cover is achievable and ductile iron pipe shall be installed for pipe with less than 1.5 feet of cover with the approval of the Engineer. All pipe shall have one (1) foot minimum cover.

Where pipe is to be laid below the ground lines, a trench shall be excavated to the required depth, the bottom of which shall be graded to the elevation of the bottom of the bedding material. When rock is encountered, it shall be excavated to not less than 12 inches below the bottom of the pipe, and this depth shall be refilled with compacted bedding material.

Where pipe is to be laid in a fill area, the embankment shall be placed and compacted to an elevation 12 inches above the top of the proposed pipe, whereupon the trench excavation shall be made and the pipe installed.

Where the nature of the foundation is poor, the culvert shall be relocated in firm material if possible. Where this cannot be done, the poor material shall be removed and replaced with a layer of bedding of such depth as the Engineer may direct; or special construction of the character shown on the plans, special provisions or as ordered by the Engineer, may be employed.

The placement of pipe shall start at the downstream end and progress upstream. All pipe shall be carefully laid, true to the lines and grades given, hubs upgrade and with spigot ends fully entered into the adjacent hubs.

The joints in concrete pipe shall be sealed with flexible, watertight rubber-type gaskets conforming to the requirements of Subarticle M.08.01.17. Where shown on the plans or directed by the Engineer, the Contractor shall connect the proposed drainage system(s) with existing drainage structures or pipes. This work shall be performed in a skillful and competent manner.

Pipes shall extend through structure walls for a sufficient distance beyond the outside surface to allow for satisfactory connections and the concrete or masonry shall be constructed around them neatly to prevent leakage along their outer surfaces. The pipe shall be cut flush with the inside face of the structure walls, headwalls and endwalls, or as shown on the plans.

Where shown on the plans or directed by the Engineer, the Contractor shall plug or abandon existing pipes with cement masonry.

Where shown on the plans to remove pipe, the Contractor shall remove and dispose of existing pipes to the limits shown on the Plans or as directed by the Engineer.

Trenches shall be backfilled above the bedding material with material approved by the Engineer. All excavated materials not required or unsuitable for backfill, (i.e., clay, silt, sand, muck, gravel, hardpan, loose shale, loose stone in masses and boulders greater than 5" in diameter) shall be removed and properly disposed of by the Contractor. Unsuitable soils that exhibit obvious evidence of heavy contamination or have been identified as containing elevated concentrations of contamination should be removed and stockpiled for characterization and possible off-site

CULVERTS

disposal. If contaminated soils are stockpiled best management practices must be employed to reduce human and environmental exposure to the stockpiled materials. Granular fill shall be used to replace all unsuitable material.

Any utility service or lateral damaged by the Contractor shall be repaired or replaced at the Contractor's expense.

The Contractor shall furnish, put in place and maintain such trench support systems (i.e., trench boxes, steel plates, steel sheeting, etc.) as may be necessary to support the sides of the excavation and to prevent any movement of earth other than that intended to be accomplished by the excavation. Trench support systems shall be designed to support earth pressures, hydrostatic pressures, equipment and construction loads, and other surcharge loads, to allow safe and expeditious construction with minimal movement or settlement of ground, to prevent damage to, or movement or settlement of, adjacent buildings, structures, or utilities. Such systems shall be installed as may be necessary for the protection of the Work and for the safety of personnel, and shall comply with the safety precautions as outlined in the Associated General Contractors of America, "Manual of Accident Prevention in Construction," the "Occupational Safety and Health Act" of 1970 (OSHA) of latest revision and OSHA Reference: U.S. Dept. Of Labor O.S.H.A. Safety and Health Standards (29 CFR 1926/1910) revised March 5, 1990, Subpart P-Excavations, Trenching & Shoring Selection of Protective Systems, 1926-652 Appendix F.

MEASUREMENT

1. New and Re-laid Pipe Culverts and Pipe-Arch Culverts will be measured for payment by the actual number of linear feet of pipe or pipe-arch culvert of the size and type specified, completed and accepted and measured in place along the invert to the inside face of manholes or other structures. Coupling bands and fittings for culvert pipe and pipe-arches will not be measured for payment.
2. Trench Excavation will not be measured for payment, but the cost thereof shall be included in the contract unit price per linear foot for the size and type of pipe being installed. Removal of existing pipe within the trench excavation limits will not be measured separately for payment, but its costs shall be considered as included in the unit price for the new pipe.
3. Trench Excavation in defined rock or ledge will be measured for payment under the item "Rock in Trench Excavation" elsewhere in these Specifications.
4. Bedding Material will not be measured for payment, but the cost thereof shall be included in the contract unit price per linear foot for the size and type of pipe being installed.
5. Granular Fill, used for trench backfill or bedding material shall not be measured for payment, but the cost shall be included in the contract unit price per linear foot for the size and type of pipe being installed.
6. Granular Fill, if required by the Engineer to replace unsuitable material below the limits

CULVERTS

of bedding material as shown on the plans, will be measured for payment as specified in the “Granular Fill” specification.

7. There will be no measurement for payment for the cost of connecting proposed drainage systems with existing systems and/or modifying existing structures as required, but the cost thereof shall be included in the contract unit price per linear foot for the size and type of pipe being installed.
8. New Culvert Ends will be measured for payment by the actual number of culvert ends installed and accepted.
9. Plug Pipe will be measured for payment by the actual number of pipe plugs installed and accepted.
10. Abandon Pipe will be measured for payment by the actual number of linear feet of pipe abandoned.
11. Remove Pipe will be measured for payment by the actual number of linear feet of pipe removed. When pipe to be removed is within the same excavation limits of new pipe (i.e. pipe replacement in same trench), the removal of the existing pipe will not be measured separately for payment, but its costs shall be considered as included in the unit price for the new pipe.
12. Pavement Restoration will be measured for payment under the Item “Temporary Pavement Repair”, “Permanent Pavement Repair” or “HMA” of the type specified elsewhere in these Specifications.
13. Lawn Restoration will be measured for payment under the Item “Restoration of Lawn Areas” elsewhere in these Specifications.

PAYMENT

1. New Pipe Culverts and Pipe-Arch Culverts will be paid for at the contract unit price per linear foot for pipe or pipe-arch of the type and size specified, complete in place, including all materials, equipment, tools and labor incidental thereto.
2. Trench Excavation will not be measured for payment, but the cost thereof shall be included in the contract unit price per linear foot for “Culvert” of the size and type installed.
3. Trench Excavation in defined rock or ledge will be paid under the Item “Rock in Trench Excavation” as specified elsewhere in these Specifications.
4. Bedding Material will not be measured for payment, but the cost thereof shall be included in the contract unit price per linear foot for the size and type of pipe being installed.

CULVERTS

5. Granular Fill, used for trench backfill or bedding material shall not be measured for payment, but the cost shall be included in the contract unit price per linear foot for the size and type of pipe being installed.
6. Granular Fill, if required by the Engineer to replace unsuitable material below the limits of bedding material as shown on the plans, shall be measured for payment as specified in the “Granular Fill” specification.
7. There will be no direct payment for the connecting of 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.
8. Culvert Ends will be paid for at the contract unit price each for culvert ends of the type and size specified, complete in place, including all materials, equipment, tools and labor incidental thereto.
9. Plug Pipe will be paid for at the contract unit price each for “Plug Pipe”, complete in place, including all materials, equipment, tools and labor incidental thereto.
10. Abandon Pipe will be paid for at the contract unit price per linear foot for “Abandon Pipe”, complete in place, including all materials, equipment, tools and labor incidental thereto.
11. Remove Pipe will be paid for at the contract unit price per linear foot for “Remove Pipe”, complete in place, which price includes all materials, equipment, tools and labor incidental thereto. Imported granular fill used to backfill the void left from the removal of the pipe will not be measured separately for payment, but its price shall be considered as included in the contract unit price for “Remove Pipe”.
12. Pavement Restoration will be paid for as specified under the Item “Temporary Pavement Repair”, “Permanent Pavement Repair” or “HMA” of the type specified elsewhere in these Specifications.
13. Lawn Restoration will be paid for as specified under the Item “Restoration of Lawn Areas” elsewhere in these Specifications.
14. There will be no direct payment for any trench support systems required to complete any of the work outlined herein.

Pay Item

15” R.C.P.
15” R.C.P. (Class V)
15” Reinforced Concrete Culvert End
Remove Pipe

Pay Unit

Linear Foot
Linear Foot
Each
Linear Foot

CATCH BASINS AND STORM MANHOLES

DESCRIPTION

“Catch Basin” and “Double Grate Catch Basin” of the type and depth specified shall consist of the construction of a new catch basin and catch basin top in accordance with the Plans and Specifications. It also includes the removal of existing catch basins within the excavation limits or in conflict with the new catch basin location.

“Reset Catch Basin Top (Type) (New Top)” includes removal of existing catch basin tops and furnishing and installing a new catch basin top in accordance with the Plans and Specifications. It also includes reconstructing the existing structure walls as necessary to accommodate the proposed elevations. Curb inlets for new catch basin tops shall match dimensions of adjacent curb.

“Reset Catch Basin Top (Type) (Existing Top)” includes the resetting of the existing catch basin top to grade. It also includes reconstructing the existing structure walls to accommodate the proposed elevations.

“Convert Catch Basin to Manhole” includes all work necessary to reconstruct an existing catch basin to a manhole in accordance with the Plans and Specifications.

“Modify Drop Inlet to Combination Catch Basin/Manhole” includes all work necessary to reconstruct an existing drop inlet structure as shown on the Plans to accommodate a new catch basin top. It also includes furnishing and installing a new manhole top, frame and cover.

“Reconstruct Drainage Structure” includes all work necessary to reconstruct an existing drainage structure as shown on the Plans.

“Storm Manhole” of the type and depth specified includes the construction of a new precast concrete manhole in accordance with the Plans and Specifications.

“Remove Drainage Structure” shall consist of the removal and disposal of an existing drainage structure called out on the plans and backfilling with granular fill.

“Abandon Drainage Structure” shall consist of the abandonment of existing drainage structures where shown on the Plans or directed by the Engineer.

Work under these items shall also include the sawcutting of existing pavement and curb, excavation, backfill and adjustment of existing structures to accommodate resetting of catch basin tops.

MATERIALS

Materials used for construction shall be those indicated on the Plans or as directed by the Engineer and shall conform to Section M.08.02 of Form 817.

CATCH BASINS AND STORM MANHOLES

Concrete inlets for Type “C” catch basin tops shall be formed to match the adjacent curb dimensions.

Manhole covers shall be cast with the words "TOWN OF MANCHESTER DRAIN" or “MANCHESTER DRAIN”.

Protective compound material shall conform to Section M.03.09 of Form 817.

Mortar shall conform to Section M.11.04 of Form 817.

Pervious material shall conform to Section M.02.05 of Form 817 and 3/4" size on the Gradation Table in Section M02.06 of Form 817.

Materials for damp-proofing shall conform to Section M.12.05 of Form 817.

Granular Fill, if required by the Engineer to replace unsuitable material below the excavation limits shown on the plans, shall conform to the requirements of “Granular Fill” elsewhere in these Specifications.

Sand for filling structures to be abandoned shall conform to the requirements of Article M.08.03 of Form 817.

Steel sheeting for excavation support systems, if required, shall conform to the requirements of ASTM A328, ASTM A572 or ASTM A690 as appropriate.

CONSTRUCTION DETAILS

These structures shall be constructed in accordance with the requirements contained herein for the character of work involved. The provisions of Section 6.02.03 of Form 817 pertaining to bar reinforcement shall apply except that shop drawings need not be submitted for approval.

The surfaces of the tops of all catch basins, junction boxes and drop inlets shall be given a coat of protective compound material immediately upon completion of the concrete curing period at the rate of .04 gallons per square yard.

All masonry units shall be laid in full mortar beds of at least ½” thickness.

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

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

CATCH BASINS AND STORM MANHOLES

If unsuitable material is encountered during the excavation at the base of a structure, then a minimum of 12 inches of granular fill shall be used as a base for the structure or as directed by the Engineer.

All structures shall be precast and shall be constructed with at least one row of concrete block between the structure walls and the precast top to accommodate future adjustment.

Frames, covers and tops which are to be reset shall be removed from their present beds, the walls or sides of the basin shall be rebuilt as required to accommodate the new top. The limits of reconstruction of the structure side walls shall be 3' (measured vertically) unless determined otherwise by the Engineer. At least one row of concrete block shall be placed between the structure walls and the newly placed top.

When directed by the engineer, frames and covers for new manholes located within limits of road reconstruction shall be temporarily set at the binder course elevation and raised to the final course elevation immediately prior to paving.

Structures to be abandoned shall have frames, covers, tops and grates removed and properly disposed of off-site. All pipes in the structure shall be plugged with concrete. The Contractor may substitute bricks with permission of the Engineer. The existing structure shall be removed to a level a minimum of two (2) feet below the surface. The remaining structure shall be filled with sand and compacted. The remaining void shall be backfilled with granular fill to the subgrade elevation of the surface restoration treatment. The portions of the structure removed shall not be used for any other Work performed on this project.

The Contractor shall furnish, put in place and maintain such excavation support systems (i.e. trench boxes, steel plates, steel sheeting, etc.) as may be necessary to support the sides of the excavation and to prevent any movement of earth other than that intended to be accomplished by the excavation. Trench support systems shall be designed to support earth pressures, hydrostatic pressures, equipment and construction loads, and other surcharge loads, to allow safe and expeditious construction with minimal movement or settlement of ground, to prevent damage to, or movement or settlement of, adjacent buildings, structures, or utilities. Such systems shall be installed as may be necessary for the protection of the Work and for the safety of personnel, and shall comply with the safety precautions as outlined in the Associated General Contractors of America, "Manual of Accident Prevention in Construction," the "Occupational Safety and Health Act" of 1970 (OSHA) of latest revision and OSHA Reference: U.S. Dept. Of Labor O.S.H.A. Safety and Health Standards (29 CFR 1926/1910) revised March 5, 1990, Subpart P-Excavations, Trenching & Shoring Selection of Protective Systems, 1926-652 Appendix F.

MEASUREMENT

“Catch Basins” of the types specified; “Convert Catch Basin to Manhole”, “Reconstruct Drainage Structure” and “Modify Drop Inlet to Combination Catch Basin/Manhole” will all be measured for payment by the actual number of structures, completed and accepted.

CATCH BASINS AND STORM MANHOLES

“Reset Catch Basin Top” of the type specified will be measured for payment by the actual number of structure tops completed and accepted.

“Remove Drainage Structure” is only used when the removal of an existing catch basin falls outside the excavation limits for a new drainage structure. When removal of an existing drainage structure falls within the excavation limits for a new drainage structure, the removal of the drainage structure shall be considered as included in the contract unit price bid for the new structure of the type specified. Only drainage structures called out on the Plan as “Remove Drainage Structure” will be measured for payment by the actual number of existing structures removed and backfilled in accordance with the Specifications.

“Abandon Drainage Structure” will be measured as the actual number of drainage structures abandoned, complete in place and accepted.

There will be no measurement or direct payment for excavation, backfill, excavation support systems, or the application of the protective compound material, but the cost of this work shall be considered as included in the contract unit prices for the appropriate item.

Granular Fill, if required by the Engineer to replace unsuitable material below the excavation limits shown on the plans, will be measured for payment under the item “Granular Fill” elsewhere in the Specifications.

The backfilling of abandoned drainage structures with sand and granular fill will not be measured separately for payment; the cost shall be considered as included in the contract unit price for “Abandon Drainage Structure”.

PAYMENT

“Catch Basin”, “Double Grate Catch Basin”, “Convert Catch Basin to Manhole”, “Reconstruct Drainage Structure”, “Storm Manhole”, “Modify Drop Inlet to Combination Catch Basin/Manhole”, “Remove Drainage Structure”, “Abandon Drainage Structure”, “Reset Manhole to Grade” and “Reset Catch Basin Top” of the types specified will be paid for at the contract unit price each of the type specified, complete in place, which price shall constitute full compensation for all materials, equipment, tools and labor incidental thereto.

Granular Fill, if required by the Engineer to replace unsuitable material below the excavation limits shown on the plans will be paid under the item “Granular Fill.”

The backfilling of abandoned drainage structures with sand and granular fill will not be paid for separately; the cost shall be considered as included in the contract unit price for “Abandon Drainage Structure”.

The following items will not be paid for separately, but the cost thereof shall be included in the contract unit price for the appropriate item.

CATCH BASINS AND STORM MANHOLES

1. Excavation for drainage structures
2. Excavation support systems
3. Removal and disposal of existing structure if in excavation limits for new structure
4. Removal and disposal of existing frames, covers, tops, grates and upper portions of structures to be abandoned
5. Reconstruction of existing structure side walls (up to 3' in depth) for reset items
6. Damp-proofing
7. Storm Manhole Frames and Covers
8. Catch Basin Frames and Grates
9. Connecting and sawcutting of Existing Pipes when installing new structures
10. Sawcutting of pavement around existing or when installing new drainage structures
11. Sawcutting of curb adjacent to drainage structures
12. Granular Fill used to backfill for abandoned or removed drainage structures
13. Pervious material used for backfill
14. Granite or concrete curb inlets

For reset items, when the work requires reconstruction of existing structure side walls greater than 3' (measured vertically), then the Engineer will determine if the additional reconstruction will be paid for as extra work or if the entire structure is to be replaced and paid for under the appropriate specification.

<u>Pay Item</u>	<u>Pay Unit</u>
Type "C-L" Double Grate Type II Catch Basin	Each
Type "C" Double Grate Type I 3-Sided Catch Basin	Each
Type "C" Catch Basin with Concrete Curb Inlet (4" Reveal)	Each
Type "C-L" Catch Basin	Each
Storm Manhole	Each
Remove Drainage Structure	Each

SANITARY SEWER MAIN

DESCRIPTION

“Sanitary Sewer” of the size and type specified shall consist of the furnishing, installation and testing of all sanitary sewer mains, including fittings and other appurtenances, trench support systems, and abandonment or removal of existing sewers as indicated on the Plans that are within the trench excavation limits or directed by the Engineer. Placement and compaction of backfill, filter fabric and bedding material shall also be included as part of this item. Removal of existing sanitary sewers and manholes located within the trench excavation limits of new sewer main will not be measured separately for payment, but shall be considered as included in the unit price bid for the new sanitary sewer main.

“Chimneys” shall consist of the furnishing and installation of sanitary sewer chimneys at the locations shown on the Plans or directed by the Engineer.

“Plug Pipe” shall consist of the plugging of existing pipes up to 12” diameter with cement masonry where shown on the Plans or as directed by the Engineer.

“Abandon Pipe with Flowable Fill” shall consist of the abandonment of existing pipes up to 12” diameter by bulkheading both ends and filling the remainder of the pipe with flowable concrete.

Refer to the General Conditions elsewhere in these specifications for licensing requirements for any person involved in the installation of a sanitary sewer and/or appurtenances.

MATERIALS

Unless otherwise specified by the Engineer, all materials shall be new and unused, shall be of the types and materials specified herein and shall meet the requirements specified herein. All material found during the progress of the work to have cracks, flaws or other defects will be rejected by the Engineer. All defective materials shall be promptly removed from the work site and replaced at no additional expense to the Town.

PVC Pipe: Polyvinyl chloride (PVC) pipe and fittings shall conform to the requirements of the latest revisions of either ASTM D3034, "Standard Specifications for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings" or ASTM F789, "Standard Specifications for Type PS-46 Poly (Vinyl Chloride) (PVC) Plastic Gravity Flow Sewer Pipe and Fittings." The pipe shall have a maximum pipe diameter to wall thickness ratio (SDR) of 35 or minimum pipe stiffness (PS) of 46 psi. Saddle Y-branches will not be allowed. Joints for PVC pipe shall be push-on bell and spigot joints using elastomeric ring gasket. The gaskets shall be securely fixed into place in the bells so that they cannot be dislodged during joint assembly. The gaskets shall be of a composition and texture which is resistant to common ingredients of sewage and industrial wastes, including oil and groundwater, and which will endure permanently under the conditions of the proposed use. The joints shall conform to the requirements of the latest revision of ASTM D-3212.

SANITARY SEWER MAIN

Flexible Couplings: Flexible couplings for connecting new PVC laterals to existing laterals shall be manufactured by Fernco, Inc., Davison, Michigan, or approved equal.

Repair Sleeves: Repair sleeves for connecting clay to clay, clay to plastic and plastic to plastic sanitary sewers shall be Strong Back Couplings – 1000 RC Series stainless steel shielded with a molded in flexible PVC gasket as manufactured by Fernco, Inc., Stainless Steel Shear Rings for use with flexible PVC gaskets as manufactured by Fernco, Inc., or SDR 35 PVC Gasketed Repair Coupling Sleeves (without stop) as manufactured by Harco, Inc.

Chimneys: Chimneys shall be precast sewer chimneys as manufactured by Superior Products Distributors, Inc., Milldale, CT, or equal. The materials incorporated into the precast chimney shall be 4,000 psi concrete, cement per ASTM C150-81, reinforcing per ASTM A615, captive "O" rings and captive seal unit gaskets shall be vulcanized natural rubber or vulcanized synthetic rubber and PVC fittings per ASTM D3034.

The sewer chimney assembly and design shall consist of three basic units:

Base Section: shall be of bridge and base pad design with both pads and bridge cast as a monolithic unit and with pads having a total minimum bearing area of 6 square feet. Bridge section shall encapsulate a captive gasket unit and be joined to the mainline vertical positioned Tee with a 6" PVC nipple, minimum length 12" tapered at both ends. Upper side of captive gasketed unit shall receive 6" PVC SDR-35 pipe. Vertical riser pipe shall be of sufficient length to protrude up through the uppermost intermediate section. Multiple sections of pipe with gasketed bell shall be acceptable to make up the necessary rise. Bridge outside width perpendicular to mainline pipe shall be 36" for mainline pipe 15" and smaller and 48" for mainline pipe 18" and larger unless approved otherwise by the Engineer.

Intermediate Section: Desired ultimate elevation of sewer chimney to the lateral shall be obtained through the use of 12", 24", 36" or 48" vertical intermediate sections, used individually or in combination. Sections shall be hollow cored with minimum outside measurement of 18" square and a round 8.4" inside diameter. Intermediate sections shall be installed by lowering over 6" PVC riser pipe and seal to the base, or other intermediate sections and captive "O" rings. PVC riser pipe shall be cut-off and have taper 2" above last intermediate section.

SANITARY SEWER MAIN

Cap Block (Top Section): Cap block shall be precast and capable of rotation of 180 degrees and/or 15 degrees from right angle to accept lateral connections of various degrees of angle. Precast cap shall encapsulate a 6" x 6" PVC Tee to accept lateral on one side and have 6" PVC plug clean-out on top. Bottom side of encapsulated Tee in Cap Block shall be gasketed and form a tight seal when installed over tapered riser pipe. Lateral connection (bell) in cap block shall be capable of accepting PVC SDR-35 or C-900, SDR-18 with tight sealing gasket. PVC lateral pipe entering chimney cap shall be SDR-35. If the distance between the main sewer centerline and the beginning of undisturbed trench wall at the lateral invert elevation exceeds four feet, PVC C-900, SDR-18 pipe shall be used to a distance not less than three feet beyond the beginning of undisturbed trench wall. Transition back to SDR-35 shall be accomplished with a tight sealing rubber of PVC coupling.

Cap, intermediate and base sections shall be attached to each other on opposite sides with 2-1/2" x 2-1/2" x 1/4" bolt-on brackets with bolts and nuts. Chimney shall eliminate infiltration and exfiltration and shall accept normal low pressure air testing. Bridge and pad assembly shall allow for normal amount of settling to occur without transmitting weight of assembly to the mainline pipe.

- Ductile Iron Pipe: Ductile iron pipe shall meet the requirements of the latest revision of AWWA C151 (ANSI A21.51). Joints shall be "Tyton Joint" design, rubber gasket push-on type manufactured in accordance with the latest revision of AWWA C111 (ANSI A21.11). Pipe shall be supplied with the standard exterior bituminous coating of either coal tar or asphalt base approximately one mil thick. The interior shall be double cement lined in accordance with the latest revision of AWWA C104 (ANSI A21.4), and pipe shall be of thickness Class 52 unless otherwise indicated. The interior of the pipe shall receive a factory applied 40 mil nominal thickness of PROTECTO 401 Ceramic Epoxy Lining, as manufactured by Induron Coatings, Inc., Birmingham, AL. Pipe shall be manufactured by Griffin, U.S. Pipe, McWane Ductile or approved equal.
- Bedding Material: Bedding material shall be crushed stone that meets the requirements of Article M.02.01-1 of Form 817.
- Backfill: Backfill material above bedding material shall be suitable material from the excavation which is free from large or frozen lumps of soil, wood or other extraneous material or, if directed by the Engineer, shall be approved backfill material meeting the requirements of Article M.02.06 (Grading "B") of Form 817.

SANITARY SEWER MAIN

- Filter Fabric:** Filter fabric shall be a non-woven fabric similar or equal to Mirafi 140 as manufactured by Celanese Fibers Marketing Company, Bidim C22 as manufactured by Monsanto Textiles Company or approved equal.
- Warning Tape:** Underground pipe warning (marking) tape shall be plastic and metallic-coated to permit detection by a magnetic sensing device. The tape shall be green in color, not less than 3 inches in width, and shall have the words "CAUTION - BURIED SEWER MAIN BELOW" repeated along the full length of the tape in letters not less than 1" high permanently fused into the tape. Pipe marking tape shall be "Terra-Tape" detectable pipe marking tape as manufactured by Reef Industries, Inc., Houston, Texas or approved equal.
- Steel Sheeting:** Steel sheeting for trench stabilization, if required, shall conform to the requirements of ASTM A328, ASTM A572 or ASTM A690 as appropriate.
- Pavement Markings:** Pavement markings installed to replace disturbed markings shall be painted, match the size and color of existing markings, and meet the requirements of "Painted Pavement Markings" as defined in the pertinent sections of these Specifications.
- Concrete:** Concrete used for plugging ends of abandoned pipes shall conform to the requirements of Article M.03.01 of Form 817 for Class "A" Concrete.
- Flowable concrete fill used for abandoning pipelines shall be excavatable with a maximum 28-day compressive strength of 150 psi. Concrete mix design shall be submitted to the Engineer for review and approval.

CONSTRUCTION DETAILS

Trench excavation and surface restoration shall conform to the requirements of the pertinent section of these Specifications. Sanitary sewer mains shall only be installed in trench conditions; embankment conditions will not be permitted.

All pipe delivered to the job site shall be accompanied by test reports certifying that the pipe and fittings conform to the above-mentioned ASTM specifications. In addition, the pipe shall be subject to thorough inspection and tests, the right being reserved for the Engineer to apply such tests as he deems necessary.

All tests shall be made in accordance with the methods prescribed by the above-mentioned ASTM specifications, and the acceptance or rejection shall be based on the test results.

The Contractor shall furnish all labor necessary to assist the Engineer in inspecting the pipe. Pipe will be inspected upon delivery, and all that does not conform to the requirements of these specifications shall be rejected and shall immediately be removed by the Contractor.

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Prior to installation, all pipe shall be stored at the site until installation in a manner acceptable to the Engineer and which will keep the pipe at ambient outdoor temperatures. Temporary shading shall be provided as required. Simply covering the pipe or structures, which allows temperature build-up when exposed to direct sunlight, shall not be done.

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. 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 directions of the manufacturers of the joint material and of the pipe, all subject to review by the Engineer. The resulting joints shall be watertight and flexible.

All premolded gasket joint polyvinyl chloride pipe of a particular manufacturer may be rejected if there are more than five unsatisfactory joint assembly operations or "belt breaks" in 100 consecutive joints, even though the pipe and joint conform to the appropriate ASTM specifications as previously 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 pipe bedding 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 pipe bedding and compacted. Then pipe bedding 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 the 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.

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. All pipe units or fittings discovered to be defective either before or after installation shall be removed and replaced with a sound unit.

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Except as otherwise indicated on the drawings, the pipe shall be supported by compacted bedding. No pipe or fittings shall be permanently supported on saddles, blocking or stones. Bedding shall be as specified in the pertinent section of these Technical Specifications. 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 completed 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.

Wye fittings, lateral connections and connections to new and existing manholes shall be installed where shown on the plans or where directed in the field by the Engineer, and shall be in accordance with the details shown on the plans. Modifying joints and inverts in existing manholes shall conform with the pertinent sections of these specifications.

Proper implements, tools and facilities shall be provided and used by the Contractor for the safe and convenient performance of the work. All pipe shall be lowered into the trench with a suitable device that will not damage protective coatings and lining. Under no circumstances shall material be dropped or dumped into the trench. Any damaged lining, coating or wrapping shall be satisfactorily repaired or replaced.

Every precaution shall be taken to prevent foreign matter from entering the pipe while it is being placed in the line. If the pipe laying crew cannot put the pipe into the trench and in place without getting earth into it, the Engineer may require that before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size be placed over the end and left until the connection is made to the adjacent pipe. If necessary, the line shall be swabbed or flushed out to remove all foreign matter prior to testing.

Before joining lengths of push-on pipe, the inside of the bell and the outside of the spigot shall be thoroughly cleaned to remove oil, grit, excess coating and other foreign matter.

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Connection of the proposed sewer to the existing sewers shall be made in a careful manner acceptable to the Engineer. Any adapters or other material required for this connection shall be subject to approval of the Engineer.

Chimneys shall be furnished by the Contractor as shown on the Plans and where ordered by the Engineer. The Contractor shall install the precast sewer chimney in accordance with the manufacturer's installation instructions.

As in the case of the branches, the exact number and location of chimneys shall be determined as the work progresses in the field. At locations designated by the Engineer to receive precast sewer chimneys, crushed stone shall be placed and compacted in 6-inch lifts from the bottom of the trench to the top of the pipe. The area of crushed stone foundation shall be at least as great as the base of the precast chimney and the stone shall be compacted to at least 95% maximum density, per ASTM D1557 Method C. After installation, crushed stone bedding shall be placed in void area under base-bridge, but shall not be overfilled, chinked or compacted.

Earth Backfill around the chimney shall be placed with extreme care and compacted evenly to avoid unbalanced earth pressure on the chimney.

All open ends of abandoned pipelines which are created or exposed by the Contractor shall be removed to a distance of 5' (minimum) from new facilities and then plugged with concrete at that point prior to backfilling.

Where pipes are to be abandoned, the Contractor shall plug ends of existing pipes with cement masonry or plug pipe ends and fill with flowable concrete fill where shown on the plans or directed by the Engineer. Presence of plugs in abandoned pipes shall be field verified by the Engineer prior to backfill.

Where pipes are abandoned with flowable concrete fill, the Contractor shall inject flowable fill at the upstream end of the pipe and visually verify the fill has reached the downstream end of the pipe for complete filling.

Care shall be taken not to excavate below the depths required to perform the Work. The Contractor shall furnish and employ such trench boxes, steel plates, shores, braces, sheeting, pumps, etc., as may be necessary for the protection of property, proper completion of the Work and the safety of the public and employees of the Contractor and the Town. All bracing, sheeting, etc., shall be removed when no longer required for the construction or safety of the Work.

All excavated materials not required or unsuitable for backfill, (i.e., clay, silt, sand, muck, gravel, hardpan, loose shale, loose stone in masses and boulders greater than 5" in diameter) shall be removed and properly disposed of by the Contractor. Unsuitable soils that exhibit obvious evidence of heavy contamination or have been identified as containing elevated concentrations of contamination should be removed and stockpiled for characterization and possible off-site disposal. If contaminated soils are stockpiled best management practices must be employed to

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reduce human and environmental exposure to the stockpiled materials. Granular fill shall be used to replace all unsuitable material.

The trench shall be excavated to the depth required and so as to provide a uniform and continuous bearing and support for the pipe on solid and undisturbed ground except that bell depressions shall be provided at each joint to permit the joint to be made properly. Further, it will not be permissible to disturb and otherwise damage the finished surface over a maximum length of eighteen (18) inches near the middle of each length of pipe by the withdrawal of pipe slings or other lifting tackle. Any part of the bottom of the trench excavated below the specified grade shall be corrected with approved material and thoroughly compacted as directed by the Engineer. The finished trench bottom shall be prepared accurately by means of hand tools.

The Contractor shall furnish, put in place and maintain such trench support systems (i.e. trench boxes, steel plates, steel sheeting, etc.) as may be necessary to support the sides of the excavation and to prevent any movement of earth other than that intended to be accomplished by the excavation. Trench support systems shall be designed to support earth pressures, hydrostatic pressures, equipment and construction loads, and other surcharge loads, to allow safe and expeditious construction with minimal movement or settlement of ground, to prevent damage to, or movement or settlement of, adjacent buildings, structures, or utilities. Such systems shall be installed as may be necessary for the protection of the Work and for the safety of personnel, and shall comply with the safety precautions as outlined in the Associated General Contractors of America, "Manual of Accident Prevention in Construction," the "Occupational Safety and Health Act" of 1970 (OSHA) of latest revision and OSHA Reference: U.S. Dept. Of Labor O.S.H.A. Safety and Health Standards (29 CFR 1926/1910) revised March 5, 1990, Subpart P-Excavations, Trenching & Shoring Selection of Protective Systems, 1926-652 Appendix F.

To insure proper conditions at all times during construction, the Contractor shall provide and maintain ample means and devices with which to intercept and/or remove promptly and dispose properly of all water entering excavations. 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 or damage to pavements, other surfaces or property. Prior to discharge, the Contractor shall be responsible for removing all particulate matter which may be deposited in a stream or storm drainage system. The Contractor shall submit his proposed methods or procedures to the Engineer for approval. The Contractor shall be responsible for complying with all Federal, State and Town regulations which may be associated with said discharges.

Bedding material installed in all trenches shall be backfilled by hand from the bottom of the trench to the top of the pipe in layers of three (3) inches, compacted by tamping to at least ninety-five percent (95%) of maximum dry density at optimum moisture content as determined in accordance with the requirements of Method D of ASTM Test Method D-1557 (latest revision). Bedding material shall be deposited in the trench for its full width on each side of the pipe, fittings and appurtenances simultaneously and the entire width of bedding material within the trench shall be covered with filter fabric. The Contractor shall use special care in placing this

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bedding material to avoid damaging or moving the pipe and to ensure the material is made compact and tight under and around the pipe. Iron tools suitable for tamping material under and on sides of pipe shall be used, and sufficient space for this tamping shall be provided. In general, wooden sticks, shovel handles and similar make-shift devices will not be considered as suitable tamping tools for use on sides of pipe.

In areas with high groundwater, rock and where directed by the Engineer, bedding material shall also be installed to a depth of one (1) foot above the top of the pipe in layers of six (6) inches or less and with all bedding material completely wrapped in filter fabric with a 12" overlap at the top. Bedding material installed above the top of the pipe shall be backfilled by hand or by approved mechanical methods and compacted to not be less than ninety five percent (95%) of maximum dry density as determined by ASTM Test Method D-1557 (latest revision). The Contractor shall use special care in placing backfill so as to avoid damaging or moving the pipe.

The remainder of the backfill above the bedding material shall be placed and compacted in one (1) foot lifts. Each layer shall be compacted to not less than ninety five percent (95%) of maximum dry density as determined by ASTM Test Method D-1557 (latest revision).

Compaction methods shall be submitted in writing to and approved by the Engineer prior to commencement of any work.

There is no guarantee that all excavation can be done by use of machinery. In some cases, the pipe location may preclude the use of machinery. In this event, the Contractor will be required to perform this Work at the same unit price bid in his proposal.

TESTING

Prior to any testing, the pipe installation shall be cleaned in the following manner, in the presence of the Engineer or his authorized Inspector.

The Contractor shall furnish an inflatable rubber ball of a size that will inflate to fit snugly into the pipe to be tested. The ball may, at the option of the Contractor, be used without a tag line; or a rope or cord may be fastened to the ball to enable the Contractor to know and control its position at all times. The ball shall be placed in the last manhole in the pipe to be cleaned and water shall be introduced behind it. The ball shall pass through the pipe with only the pressure of the water impelling it. All debris flushed out ahead of the ball shall be removed at the first manhole where its presence is noted. In the event cemented or wedged debris or a damaged pipe shall stop the ball, the Contractor shall remove the obstruction. With absolutely no exceptions shall this waste debris be allowed into another sewerage line. Alternative methods of cleaning may be substituted only with the approval of the Engineer.

Sanitary sewers will be checked by the Inspector to determine whether any displacement of the pipe has occurred, after the trench has been backfilled and compacted. Should any pipe displacement be detected, the Contractor shall do all corrective work as is necessary, to the satisfaction of the Engineer, without additional compensation.

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All sanitary sewers to be accepted by the Town will be tested by low pressure air.

Tests will be made after the pipe installation is complete, including the installation of laterals and manholes. The trench shall be backfilled and compacted or consolidated as required by the Engineer. Tests shall be completed before any permanent pavement is in place but after the roadway base has been constructed.

The Contractor is 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 low pressure air test. The test shall be performed using the below stated equipment, according to stated procedures and under the supervision of the inspecting Engineer or his authorized Inspector. The Contractor or his 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 Engineer. Equipment used shall meet the following minimum requirements and shall be subject to approval by the Engineer:

1. Pneumatic plugs shall have a sealing length equal to or greater than the diameter of the pipe to be inspected.
2. Pneumatic plugs shall resist internal test pressures without requiring external bracing or blocking.
3. All air used shall pass through a single control panel.
4. Three (3) individual hoses shall be used for the following connections:
 - a. From control panel to pneumatic plugs for inflation.
 - b. From control panel to sealed line for introducing the low pressure air.
 - c. From sealed line to control panel for continually monitoring the air pressure rise in the sealed line.
5. All pneumatic plugs shall be seal tested before being used in the actual test installation. One length of pipe shall be laid on the ground and sealed at both ends with the pneumatic plugs to be checked. Air shall be introduced into the plugs to 25 psig. The sealed pipe shall be pressurized to 5 psig. The plugs shall hold against this pressure without bracing and without movement of the plugs out of the pipe.

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

All gages, controls and appurtenances for equipment used to conduct the test will be located out of manholes. 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 Contractor shall determine the elevation of the ground water table in the area of the pipeline being subjected to the low pressure air test.

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After a manhole-to-manhole section of pipe has been completed, cleaned and the pneumatic plugs checked by the above procedure, the plugs shall be placed in the line at each manhole and inflated to 25 psig. Low pressure air shall be introduced into this sealed line until the internal air pressure reaches 4 psig greater than the average back pressure of any groundwater that may be over the pipe. At least two (2) minutes shall be allowed for the air pressure to stabilize.

After the stabilization period, the pressure shall be set at 3.5 psig greater than the average back pressure due to groundwater and the air hose from the control panel to the air supply shall be disconnected. The portion of line being tested shall be termed "Acceptable" if the time required in minutes and seconds for the pressure to decrease from 3.5 psig greater than the average back pressure due to groundwater to 2.5 psig greater than the average back pressure due to groundwater is not less than the time shown for the given diameters in the following table:

<u>Pipe Diameter (in)</u>	<u>Time (Minutes:Seconds)</u>
6	2:50
8	3:47
10	4:43
12	5:40
15	7:05
18	8:30
21	9:55
24	11:20

NOTE: When one or more laterals are connected to the main, the allowable time in the table will be decreased by 30 seconds.

If the installation fails to meet the above requirements, the Contractor shall, at his own expense, determine the source of leakage and shall repair, replace and retest all defective work as necessary.

Whenever groundwater is present, the Contractor shall, as directed by the Engineer, perform infiltration and exfiltration tests. Groundwater infiltration or exfiltration into any sewer shall not exceed a maximum of 100 gallons per inch of pipe diameter per day per mile of sewer. The procedure for these tests is as follows:

1. Infiltration Test: All labor, temporary equipment, and materials, including weirs necessary for such tests, shall be furnished by the Contractor. The installation of the weir shall be made in such manholes as directed by the Engineer. Where weir measurements are not suitable in the Engineer's opinion, other methods of measurement, as he shall determine, may be adopted. In making infiltration tests, the Engineer may flood the trench with water if, in his opinion, such procedure is necessary to fairly represent actual

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service conditions as they may vary throughout the year.

2. **Exfiltration Test:** The Contractor shall supply all water, plugs and all labor and equipment required for that test.

The exfiltration test shall be made by filling the sewer line with water so as to obtain a hydrostatic head, on top of the pipe in the upstream manhole of the line under test, of at least four (4) feet, but not greater than ten (10) feet. The amount of exfiltration will be obtained by observing the rate of drop in the water level at the upstream manhole hourly for the first six (6) hours and thereafter, at intervals of time as directed by the Engineer.

After cleaning, deflection testing (i.e., 7 1/2% deflection mandrel) shall be performed on all PVC sanitary sewer installations. Dimensions for the 7 1/2% deflection mandrels shall be as indicated in ASTM D3034 of latest revision. Testing shall be done not less than 30 days following completion of installation. The sequence of all testing shall be as specified by the Engineer.

After cleaning, television inspection shall be performed on all new sanitary sewer installations unless otherwise directed by the Engineer. It is the intent to have the testing take place under a no-flow condition.

The television camera used for the inspection shall be one specifically designed and constructed for such inspection. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions. The camera, television monitor, and other components of the video system shall be capable of producing picture quality to the satisfaction of the Engineer and, if unsatisfactory, equipment shall be removed and new equipment provided.

1. The camera shall be moved through the line in either direction at a moderate rate, stopping when necessary to permit proper documentation of the sewer's condition. In no case will the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power winches, TV cable, and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line. If, during the inspection operation, the television camera will not pass through the section, the Contractor shall set up his equipment so that the inspection can be performed from the opposite manhole.
2. When manually operated winches are used to pull the television camera through the line, telephones or other suitable means of communication shall be set up between the two (2) manholes of the section being inspected to insure good communications between members of the crew.
3. The importance of accurate distance measurements is emphasized. Measurement for location of defects shall be above ground by means of a meter device. Marking on the cable, or the like, which would require interpolation for depth of manhole, will not be

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allowed. Accuracy of the distance meter shall be checked by use of a walking meter, roll-a-tape, or other suitable device, and the accuracy shall be satisfactory to the Engineer.

4. Documentation of the television results shall be as follows:
 - a. Television Inspection Logs: Printed location records shall be kept by the Contractor and will clearly show the location in relation to an adjacent manhole of each infiltration point observed during inspection. In addition, other points of significance such as location of laterals, unusual conditions, broken pipe and other discernible features will be recorded and a copy of such records will be supplied to the Town.
 - b. Digital Recordings: The purpose of digital recordings shall be to supply a visual and audio record of problem areas of the lines that may be replayed. Media recording playback shall be at the same speed that it was recorded. Slow motion or stop-motion playback features may be supplied at the option of the Contractor. The digital files shall be turned over to the Town at the completion of the Project.
5. The Contractor shall have all video inspections readily accessible for review by the Town during the Project.
6. If any testing of sewers indicates problems, additional television testing may be ordered by the Engineer.

Final inspection of the work will include a visual inspection of each section of sewer by looking from the manhole with the aid of reflected sunlight or an electric torch. The pipe shall be true to both line and grade; shall show no leaks; shall be free from cracks and from protruding joint materials and contain no deposits of sand, dirt, or other materials which will reduce the full cross-sectional area. Groundwater infiltration shall not exceed the rates hereinbefore stipulated. Wall joints shall be tight. All finished work shall be neat in appearance and of first class workmanship. The Contractor shall furnish two (2) laborers to assist in this inspection. In addition, all dwelling units will be dye tested to insure that each unit is connected to the new facilities. Sewer Department personnel will assist with the dye tests during normal working hours.

MEASUREMENT

“Sanitary Sewer” of the size and type specified will be measured for payment by the actual number of linear feet, completed and accepted, measured in place along the horizontal projection of the center line of pipe. The depth shall be measured as the depth from the ground surface to the pipe invert. Where the pipe is laid beyond a manhole, the measurement will be taken to the end of the pipe as laid. The lengths of manhole inverts, as measured between inside walls of the manhole, shall be deducted. No deduction will be made in the length of pipe for wyes and tee/wyes.

“Chimneys” will be measured for payment by the actual number of vertical linear feet, measured

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from the invert of the sewer to the top of the vertical section of the chimney pipe.

Wyes, tee/wyes, bends, caps, couplings and other such fittings will not be measured for payment; the cost shall be considered as included in the contract unit price bid for “Sanitary Sewer” or “Chimney” of the size and type specified.

“Plug Pipe” will be measured for payment by the actual number of plugs installed and accepted in pipes up to 12” diameter.

“Abandon Existing Pipe with Flowable Fill” will be measured for payment by the actual number of linear feet of pipes up to 12” diameter that are filled and accepted.

Testing and inspection (including TV inspection) of sanitary sewers and handling existing sewage flows will not be measured for payment; the cost shall be considered as included in the contract unit price for “Sanitary Sewer” of the size and type specified.

Trench excavation, backfill, filter fabric, bedding material and trench support systems will not be measured for payment; the cost shall be considered as included in the contract unit price for “Sanitary Sewer” of the size and type specified.

Granular fill for replacement of unsuitable material within the trench excavation will be measured for payment as described in the pertinent section of these Specifications.

Rock in trench excavation will be measured as described in the “Excavation” section of these Technical Specifications.

Pavement and lawn restoration will be measured as described in the pertinent sections of these Technical Specifications.

Removal of existing sanitary sewers and salvage and disposal of existing materials as indicated on the plans, within the limits of trench excavation or where directed by the Engineer will not be measured for payment; the cost shall be considered as included in the contract unit price bid for “Sanitary Sewer” of the size and type specified.

Pavement markings installed to replace disturbed markings will not be measured separately for payment; the cost shall be considered as included in the contract unit price bid for “Sanitary Sewer” of the size and type specified.

PAYMENT

Furnishing and installation of sanitary sewers will be paid for at the contract unit price per linear foot for “Sanitary Sewer” of the size and type specified, complete in place, which price shall include trench excavation, backfill, filter fabric, bedding material, bends, caps and other such fittings/couplings, pipe bedding, filter fabric, connecting to existing manholes and associated modifications to existing or construction of new inverts, testing, TV inspection and handling of sewage flows, removal of existing sanitary sewers and manholes within the trench excavation limits, including all materials, labor, tools and equipment necessary to complete the Work.

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Chimneys, as measured for payment above will be paid for at contract unit price per vertical linear foot for "Chimney", complete in place, which price shall include all materials, tools, equipment and labor incidental thereto.

Wyes, tee/wyes, bends, caps, couplings and other such fittings will be considered as included in the contract unit price bid for "Sanitary Sewer" or "Chimney" of the size and type specified.

"Plug Pipe" will be paid for at the contract unit price for each plug installed within pipes up to 12" diameter, complete in place, including all materials, equipment, tools and labor incidental thereto.

"Abandon Pipe with Flowable Fill" will be paid for at the contract unit price per linear foot of fill placed in pipes up to 12" diameter, complete in place, including all materials, equipment, tools and labor incidental thereto.

Testing and inspection (including TV inspection) of sanitary sewers and handling existing sewage flows will be considered as included in the contract unit price for "Sanitary Sewer" of the size and type specified.

Trench excavation, backfill, filter fabric, bedding material and trench support systems will be considered as included in the contract unit price for "Sanitary Sewer" of the size and type specified.

Granular fill for replacement of unsuitable material within the trench excavation will be paid for as described in the pertinent section of these Specifications.

Rock in trench excavation will be paid for as described in the "Excavation" section of these Technical Specifications.

Pavement and lawn restoration will be paid for as described in the pertinent sections of these Technical Specifications.

Removal of existing sanitary sewers and salvage and disposal of existing materials as indicated on the plans within the limits of trench excavation or where directed by the Engineer will be considered as included in the contract unit price bid for "Sanitary Sewer" of the size and type specified.

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Pavement markings installed to replace disturbed markings will be considered as included in the contract unit price bid for "Sanitary Sewer" of the size and type specified.

<u>Pay Item</u>	<u>Pay Unit</u>
8" PVC Sanitary Sewer (0'-10' Deep)	Linear Foot
8" PVC Sanitary Sewer (10'-15' Deep)	Linear Foot
Precast Concrete Sewer Chimney	Vertical Linear Foot
Plug Pipe	Each
Abandon Pipe with Flowable Fill	Linear Feet

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DESCRIPTION

“Sanitary Sewer Lateral” of the size and type specified shall consist of the furnishing, installation and testing of all sanitary sewer building connections, including fittings and other appurtenances as indicated on the Plans or directed by the Engineer. It shall also include connecting new laterals to existing sanitary sewer mains, and abandonment and removal of existing laterals located within the trench excavation limits or directed by the Engineer.

“Relocate Sanitary Sewer Lateral” of the size and type specified includes relocating existing sanitary sewer laterals where shown on the Plans or where directed by the Engineer. It includes, but is not limited to: removing existing lateral; furnishing and installing new PVC lateral and appurtenances; connecting new lateral to existing sanitary sewer main; and handling of existing sewage flows.

“Abandon Sanitary Sewer Lateral” includes disconnecting a sanitary lateral from the sewer main where located outside the limits of trench excavation as shown on the Plans or where directed by the Engineer. It includes, but is not limited to disconnecting the existing lateral at the wye or tee fitting; plugging the lateral and fitting with cement masonry so it does not impede flow in the sewer main; and handling of existing sewage flows as required.

“Cleanout” of the size and type specified includes furnishing and installing polyvinyl chloride sanitary sewer cleanouts at the locations shown on the Plan or where directed by the Engineer.

“Interior Sanitary Sewer Piping” of the size and type specified shall consist of the furnishing and installation of sanitary sewer piping within building structures including all required fittings and other appurtenances, removing pipes, supporting pipes to remain and capping pipe ends as indicated on the Plans or directed by the Engineer.

Refer to the General Conditions elsewhere in these specifications for licensing requirements for any person involved in the installation of a sanitary sewer and/or appurtenances.

MATERIALS

PVC Pipe: Polyvinyl chloride (PVC) pipe and fittings shall conform to the requirements of the latest revisions of either ASTM D-3034, "Standard Specifications for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings" or ASTM F-789, "Standard Specifications for Type PS-46 Poly (Vinyl Chloride) (PVC) Plastic Gravity Flow Sewer Pipe and Fittings." The pipe shall have a maximum pipe diameter to wall thickness ratio (SDR) of 35 or a minimum pipe stiffness (PS) of 46 psi.

Saddle connections may be used for connections to existing sanitary sewer mains only where approved by the Engineer.

Joints for PVC pipe shall be push-on bell and spigot joints using elastomeric ring gasket. The gaskets shall be securely fixed into place in

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the bells so that they cannot be dislodged during joint assembly. The gaskets shall be of a composition and texture which is resistant to common ingredients of sewage and industrial wastes, including oil and groundwater, and which will endure permanently under the conditions of the proposed use. The joints shall conform to the requirements of the latest revision of ASTM D-3212.

- Flexible Couplings: Flexible couplings for connecting relocated PVC laterals to existing laterals shall be manufactured by Fernco, Inc., Davison, Michigan, or approved equal.
- Frame and Covers: Frames and covers for sanitary sewer cleanouts shall be heavy duty Pattern No. 4155 as manufactured by Campbell Foundry Co., Harrison, NJ or Catalog No. R-1975-A2 as manufactured by Neenah Foundry, Neenah, WI. Frames and covers located within paved areas shall be rated for AASHTO-H20-44 loading. Cast iron shall conform to ASTM A-48 Class 25, with latest revisions. Castings shall be coated with a bituminous waterproofing material.
- Mechanical Plugs: Mechanical plugs to be used in sanitary sewer cleanouts shall be the Econo-Grip No. 271-578 as manufactured by Cherne.
- Bedding Material: Bedding material shall be crushed stone that meets the requirements of Article M.02.01-1 of Form 817.
- Backfill: Backfill material above bedding material shall be suitable material from the excavation which is free from large or frozen lumps of soil, wood or other extraneous material or, if directed by the Engineer, shall be approved backfill material meeting the requirements of Article M.02.06 (Grading "B") of Form 817.
- Filter Fabric: Filter fabric shall be a non-woven fabric similar or equal to Mirafi 140 as manufactured by Celanese Fibers Marketing Company, Bidim C22 as manufactured by Monsanto Textiles Company or approved equal.
- Pavement Markings: Pavement markings installed to replace disturbed markings shall be painted, match the size and color of existing markings, and meet the requirements of "Painted Pavement Markings" as defined in the pertinent sections of these Specifications.

CONSTRUCTION DETAILS

Trench excavation and backfill and surface restoration shall be done in accordance with the pertinent sections of these Technical Specifications.

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All pipe and fittings delivered to the job site shall be accompanied by test reports certifying that the pipe and fittings conform to the above-mentioned ASTM specifications. In addition, the pipe shall be subject to thorough inspection and tests, the right being reserved for the Engineer to apply such tests as he deems necessary.

All tests shall be made in accordance with the methods prescribed by the above-mentioned ASTM specifications, and the acceptance or rejection shall be based on the test results.

The Contractor shall furnish all labor necessary to assist the Engineer in inspecting the pipe. Pipe will be inspected upon delivery, and all that does not conform to the requirements of these specifications shall be rejected and shall immediately be removed by the Contractor.

Prior to installation, all pipe shall be stored at the site until installation in a manner acceptable to the Engineer and which will keep the pipe at ambient outdoor temperatures. Temporary shading shall be provided as required. Simply covering the pipe or structures, which allows temperature build-up when exposed to direct sunlight, shall not be done.

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. 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.

Installation and joint assembly shall follow the directions of the manufacturers of the joint material and of the pipe. The resulting joints shall be watertight 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 "belt 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 Technical Specifications.

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

All laterals shall be installed with the minimal number of bends between the building being served and the sanitary sewer main and individual bends shall not exceed 45 degrees.

Cleanouts shall be installed at all cumulative changes of lateral direction exceeding 45 degrees, at a spacing of no more than one hundred feet (100') and where shown on the Plans or directed by the Engineer. Cleanouts shall be installed with a cover at grade to facilitate access for cleaning.

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Bedding material installed in all trenches shall be backfilled by hand from the bottom of the trench (located a minimum of six inches below the pipe) to the top of the pipe in layers of three (3) inches, compacted by tamping to at least ninety-five percent (95%) of maximum dry density at optimum moisture content as determined in accordance with the requirements of Method D of ASTM Test Method D-1557 (latest revision). Bedding material shall be deposited in the trench for its full width on each side of the pipe, fittings and appurtenances simultaneously and the entire width of bedding material within the trench shall be covered with filter fabric. The Contractor shall use special care in placing this bedding material so as to avoid damaging or moving the pipe and to ensure the material is made compact and tight under and around the pipe. Iron tools suitable for tamping material under and on sides of pipe shall be used, and sufficient space for this tamping shall be provided. In general, wooden sticks, shovel handles and similar make-shift devices will not be considered as suitable tamping tools for use on sides of pipe.

In areas with high groundwater, rock and where directed by the Engineer, bedding material shall also be installed to a depth of six (6) inches above the top of the pipe in layers of six (6) inches or less and with all bedding material completely wrapped in filter fabric with a 12" overlap at the top. Bedding material shall be compacted by tamping to at least ninety five percent (95%) of maximum dry density as determined by ASTM Test Method D-1557 (latest revision). The layer of bedding above the top of the pipe shall be consolidated by means of hand held vibratory compactors.

After each pipe has been properly bedded, enough pipe bedding 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 pipe bedding and compacted.

The remainder of the backfill above the bedding material shall be placed and compacted in one (1) foot lifts. Each layer shall be compacted to not less than ninety five percent (95%) of maximum dry density as determined by ASTM Test Method D-1557 (latest revision).

Compaction methods shall be submitted in writing to and approved by the Engineer prior to commencement of any work.

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 the 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.

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. All pipe units or fittings discovered to be defective either before or after installation shall be removed and replaced with a sound unit.

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Except as otherwise indicated on the drawings, the pipe shall be supported by compacted bedding. No pipe or fitting shall be permanently supported on saddles, blocking or stones.

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 completed 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.

Wye fittings, laterals and connections to manholes shall be installed where shown on the plans or where directed in the field by the Engineer, and shall be in accordance with the details shown on the plans. Modifying joints and inverts in existing manholes shall conform with the pertinent sections of these specifications.

Proper implements, tools and facilities shall be provided and used by the Contractor for the safe and convenient performance of the work. All pipe shall be lowered into the trench with a suitable device that will not damage protective coatings and lining. Under no circumstances shall material be dropped or dumped into the trench. Any damaged lining, coating or wrapping shall be satisfactorily repaired or replaced.

Every precaution shall be taken to prevent foreign matter from entering the pipe while it is being placed in the line. If the pipe laying crew cannot put the pipe into the trench and in place without getting earth into it, the Engineer may require that before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size be placed over each end and left there until the connection is to be made to the adjacent pipe. If necessary, the line shall be swabbed or flushed out to remove all foreign matter prior to testing.

Before joining lengths of push-on pipe, the inside of the bell and the outside of the spigot shall be thoroughly cleaned to remove oil, grit, excess coating and other foreign matter.

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Connection of the proposed sewer to the existing sewers shall be made in a careful manner acceptable to the Engineer. Any adaptors or other material required for this connection shall be subject to approval of the Engineer.

Trenches shall be backfilled above the bedding material with material approved by the Engineer. All excavated materials not required or unsuitable for backfill, (i.e., clay, silt, sand, muck, gravel, hardpan, loose shale, loose stone in masses and boulders greater than 5" in diameter) shall be removed and properly disposed of by the Contractor. Unsuitable soils that exhibit obvious evidence of heavy contamination or have been identified as containing elevated concentrations of contamination should be removed and stockpiled for characterization and possible off-site disposal. If contaminated soils are stockpiled best management practices must be employed to reduce human and environmental exposure to the stockpiled materials. Granular fill shall be used to replace all unsuitable material.

Sanitary sewer laterals shall be relocated as directed in the field by the Engineer, and shall be in accordance with the details shown on the plans.

Sanitary sewer laterals shall be abandoned by disconnecting the existing lateral from the fitting on the existing sewer main and plugging the ends of the lateral and fitting with cement masonry as directed in the field by the Engineer so flow within the sewer is not impeded.

Any lateral which is interrupted shall be reconnected on the same working day and in no case shall service be interrupted for more than 6 hours.

After relocation, the trench shall be backfilled and all areas disturbed during the installation shall be restored to at least its original condition, to the satisfaction of the Engineer.

Connection of laterals to PVC pipe shall be made with either wyes or tee/wyes. They shall be installed as recommended by the manufacturer.

Where existing laterals are to be reconnected, the reconnection shall be made using a flexible coupling.

Sanitary sewer clean-outs shall be placed in laterals as directed by the Engineer.

All open ends of abandoned pipelines which are created or exposed by the Contractor shall be removed to a distance of 5' (minimum) from new facilities and then sealed with cement masonry at that point prior to backfilling.

Where excavations are to be made in grass covered areas, loam and topsoil shall be carefully removed and separately stored to be used again. If the Contractor prefers not to separate surface materials he shall furnish, as directed by the Engineer, loam and topsoil at least equal in quality to that excavated.

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The Contractor shall be fully responsible for damage done to trees and shrubs as a result of this work. It shall be the Contractor's responsibility to preserve existing trees and shrubs, including those temporarily removed where necessary. All trees and shrubs that are removed, killed, or that have, in the opinion of the Engineer, suffered significant permanent damage shall be replaced, at no additional costs, in an acceptable manner with trees or shrubs approved by the Engineer.

Where it appears as though permanent damage to existing trees and shrubs is unavoidable, the Contractor may petition the Engineer to request moving the lateral from the location specified. The Contractor shall not be allowed to vary the lateral location from that specified herein and as shown on the Plans without specific permission of the Engineer.

A final inspection of the work will include a visual inspection of each section of lateral. The pipe shall be true to both line and grade; shall show no leaks; shall be free from cracks and from protruding joint materials and contain no deposits of sand, dirt, or other materials which will reduce the full cross-sectional area. Groundwater infiltration shall not be present. Wall joints shall be tight. All finished work shall be neat in appearance and of first class workmanship. The Contractor shall furnish two (2) laborers to assist in this inspection.

MEASUREMENT

“Sanitary Sewer Lateral” of the size and type specified will be measured for payment by the actual number of linear feet of the size and type specified, complete and accepted, as measured from the wye, inside face of the manhole or outside face of the chimney to the point of connection with the existing pipe. Where interior piping is to be modified, measurement for building connections shall be to a point five (5) feet outside the foundation wall of the building. Protection, removal and replacement of existing features such as, but not limited to, walls, fences, trees, shrubs and plants required for installation of sanitary sewer laterals will not be measured for payment; the cost will be considered to be included in the contract unit price for “Sanitary Sewer Lateral” of the size and type specified.

“Relocate Sanitary Sewer Lateral” of the size and type specified will be measured for payment by the actual number of linear feet of the size and type specified, complete and accepted, as measured from the center of the Fernco connection at each end of the relocated pipe.

“Abandon Sanitary Sewer Lateral” will be measured as the actual number of sanitary sewer lateral abandonments, complete in place and accepted.

“Cleanouts” of the size and type specified will be measured for payment by the unit of the size and type indicated, complete and accepted. Measurement shall include pipe, plug, fittings, frames and covers.

“Interior Sanitary Sewer Piping” of the size and type specified will be measured for payment by the actual number of linear feet of the size and type specified, complete and accepted, as measured between connections to pipes within a building structure.

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Bends, caps and other such fittings/couplings, pipe bedding and filter fabric (envelope), testing and handling of sewage flows will not be measured for payment; the cost will be considered to be included in the contract unit price for “Sanitary Sewer Lateral” or “Relocate Sanitary Sewer Lateral” of the size and type specified.

Wyes, tee/wyes and saddle connections (where allowed by the Engineer) and steel markers (where required for locating pipe ends) will not be measured for payment; the cost will be considered to be included in the contract unit price for “Sanitary Sewer Lateral” or “Relocate Sanitary Sewer Lateral” of the size and type specified.

Rock in trench excavation will be measured for payment as described in the “Excavation” section of these Specifications.

Trench excavation and backfill will not be measured for payment; the cost will be considered to be included in the contract unit price for “Sanitary Sewer Lateral”, “Relocate Sanitary Sewer Lateral” of the size and type specified, and “Abandon Sanitary Sewer Lateral”.

Surface restoration will be measured for payment as described in the pertinent section of these Technical Specifications.

Pavement markings installed to replace disturbed markings will not be measured separately for payment; the cost shall be considered as included in the contract unit price bid for “Sanitary Sewer Lateral”, “Relocate Sanitary Sewer Lateral” of the size and type specified, and “Abandon Sanitary Sewer Lateral”.

PAYMENT

“Sanitary Sewer Lateral” of the size and type specified will be paid for at the contract unit price per linear foot, which price shall include trench excavation, backfill, bends, caps and other such fittings/couplings, pipe bedding, filter fabric, connecting to existing manholes and associated modifications to existing or construction of new inverts, connecting new laterals to existing sanitary sewer mains, testing and handling of sewage flows, abandonment and removal of existing sanitary laterals within the trench excavation limits, including all materials, labor, tools and equipment necessary to complete the Work. This price shall also include protection, removal and replacement of existing features such as, but not limited to, walls, fences, trees, shrubs and plants required for installation of sanitary sewer laterals of the size and type specified.

“Relocate Sanitary Sewer Lateral” of the size and type specified will be paid for at the contract unit price per linear foot, which price shall include removing existing lateral; furnishing and installing new PVC lateral and appurtenances; connecting new lateral to existing sanitary sewer main; handling of existing sewage flows; and all materials, equipment, tools, labor and incidentals necessary to complete the Work.

“Abandon Sanitary Sewer Lateral” will be paid for at the contract unit price for each sanitary sewer lateral abandonment located outside limits of trench excavation, which price shall include

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excavation; backfill; handling of sewage flows; and all materials, equipment, tools, labor and incidentals necessary to complete the Work.

“Cleanouts” will be paid for at the contract unit price each for "Cleanout" of the size and type indicated, which price shall include all materials, equipment, tools, labor and incidentals necessary to complete the Work.

“Interior Sanitary Sewer Piping” of the size and type specified will be paid for at the contract unit price per linear foot, which price shall include furnishing and installing sanitary sewer piping within building structures, all required fittings and other appurtenances, removing pipes, supporting pipes to remain and capping pipe ends as indicated on the Plans or directed by the Engineer, cleanup and all materials, labor, tools and equipment necessary to complete the Work.

Bends, caps and other fittings/couplings, pipe bedding and filter fabric (envelope), testing and handling of sewage flows will not be paid for separately; the cost shall be considered as included in the contract unit price for “Sanitary Sewer Lateral” or “Relocate Sanitary Sewer Lateral” of the size and type specified.

Wyes, tee/wyes and saddle connections (where allowed by the Engineer) and steel markers (where required for locating pipe ends) will not be paid for separately; the cost will be considered to be included in the contract unit price for “Sanitary Sewer Lateral” or “Relocate Sanitary Sewer Lateral” of the size and type specified.

Rock in trench excavation will be measured for payment as described in the “Excavation” section of these Technical Specifications.

Trench excavation and backfill will not be measured for payment; the cost will be considered to be included in the contract unit price for “Sanitary Sewer Lateral” or “Relocate Sanitary Sewer Lateral” of the size and type specified, and “Abandon Sanitary Sewer Lateral”.

Surface restoration will be measured for payment as described in the pertinent section of these Technical Specifications.

Pavement markings installed to replace disturbed markings will be considered as included in the contract unit price bid for “Sanitary Sewer Lateral” or “Relocate Sanitary Sewer Lateral” of the size and type specified, and “Abandon Sanitary Sewer Lateral”.

Pay Item

6” PVC Sanitary Sewer Lateral
6” PVC Cleanout
Interior Sanitary Sewer Piping

Pay Unit

Linear Foot
Each
Linear Foot

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DESCRIPTION

“Sanitary Manhole” of the size and type specified shall consist of the furnishing and construction of all sanitary sewer manholes in conformity with the lines, grades, dimensions and details shown on the plans.

“Remove Sanitary Manhole” shall consist of the complete removal of existing sanitary sewer manhole and the backfilling and compacting of the remaining void with granular fill. Only manholes specifically called out on the Plans to be removed will be measured for payment under this item; existing manholes removed within the excavation limits of new pipe and manholes will not be measured for payment, but its costs are considered included in the unit price for “Sanitary Sewer Main” and “Sanitary Manhole”, respectively.

“Abandon Sanitary Manhole” shall consist of the abandonment of existing sanitary sewer manholes where shown on the Plans or directed by the Engineer.

MATERIALS

Precast manhole sections shall be similar or equal to that shown on the Plans and shall conform to ASTM C-478 and C-443 (joint).

Precast concrete masonry units shall meet the requirements of ASTM C139.

Concrete shall be Class "A" and shall conform to the requirements of Section M.03 of Form 817.

Brick shall conform to ASTM Specifications C-32 for sewer brick. Brick for manhole shelves and inverts shall be dense, hard-burned brick and shall conform to grade SS. All other brick shall conform to grade MS.

Standard mortar shall consist of one (1) part cement and two (2) parts clean sand. No lime shall be added to the mortar.

Manhole frame adjustment rings shall be pressure injected molding consisting of a polypropylene/fiberglass mixture, precast concrete, concrete block or brick. Polypropylene/fiberglass adjustment rings shall be manufactured by the Turner Company of Raleigh, NC or Markham, Ontario.

Manhole frames and covers located within paved areas shall be heavy duty and shall be Model 1027C with an 8” high frame as manufactured by Campbell Foundry Company, Model 2927E as manufactured by Laperle Foundry Company or Model/Product Numbers 00133872 and 00124811 as manufactured by East Jordan Ironworks.

Manhole frames and covers located within unpaved areas shall be heavy duty and water-tight (bolted and gasketed) with ½” stainless steel bolts and shall be Model 1009 as manufactured by Campbell Foundry Company, Model 6502 as manufactured by Laperle Foundry Company or Model/Product Numbers 00124872 and 0124872W03 as manufactured by East Jordan

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Ironworks.

The cover shall be cast with the words "MANCHESTER SEWER". Cast iron shall conform to ASTM A-48 Class 30B or its latest revisions. Frames and covers shall be coated with a bitumastic coating.

Flexible joints shall be used where indicated on the plans and details for all manhole to pipe connections and shall be Kor-N-Seal as manufactured by NPC, Inc., Milford, New Hampshire, "Press Wedge II" as manufactured by Press Seal Gasket Corp., Fort Wayne, Indiana or "Lock Joint Flexible Manhole Sleeve" as manufactured by Interpace Corp., Parsippany, New Jersey.

Pipe and fittings for manhole drops shall conform to the requirements of the associated detail pertinent section of these Specifications.

Coating for exterior surfaces of all manhole components shall be bituminous waterproofing material. The material shall be Minwax Fibrous Brush Coat made by Minwax Co., New York, New York; Tremco 121 Foundation Coating made by the Tremco Manufacturing Company, Cleveland, Ohio; Bitumastic Black Solution made by the Koppers Company, Inc., Pittsburgh, Pennsylvania; or approved equal product.

Sand for filling manholes to be abandoned shall conform to the requirements of Article M.08.01-21 of Form 817.

Granular Fill shall conform to the requirements of "Granular Fill" elsewhere in these Specifications.

Steel sheeting for excavation support systems, if required, shall conform to the requirements of ASTM A328, ASTM A572 or ASTM A690 as appropriate.

CONSTRUCTION DETAILS

Trench excavation shall conform to the requirements of the "Excavation" section of these Technical Specifications.

Bases shall be precast concrete. The precast riser and cone sections shall be installed truly plumb.

The Contractor's attention is directed to the requirement for neoprene gaskets or bituminous sealer for joints, which shall be installed in accordance with manufacturer's recommendations. After assembly of all sections is completed, the joints shall be pointed with mortar on both inside and outside surfaces of the manhole. All lifting holes shall be filled with mortar.

Inverts shall be constructed of precast concrete or cast-in-place concrete and shall conform accurately to the size of the adjoining pipes. Brick and mortar inverts shall be installed where directed by the Engineer.

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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, within the manhole, to the centerlines of the adjoining pipelines.

Manhole frames shall be set with the tops conforming to the finished grade of the pavement, ground surface or as directed by the Engineer.

Precast concrete, concrete blocks and/or bricks, or polypropylene/fiberglass grade adjustment rings shall be installed as directed by the Engineer, with a minimum 4 inch and a maximum 12 inch height, to adjust the manhole to the grade as shown on the drawings and to accommodate future adjustment. Frames shall be set concentric with the top of the concrete or brick riser section and in a full bed of mortar so that the space between the top of the riser 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 riser section shall be placed all around and on the top of the bottom flange for manholes in unpaved areas. The mortar shall be smoothly finished and have a slight slope to shed water away from the frame.

The exterior surfaces of all manhole components shall be given two (2) coats of bituminous waterproofing material acceptable to the Engineer. The material shall be applied by brush or spray in accordance with the manufacturer's recommendations. Sufficient time shall be allowed between coats so that application of the second coat shall not affect the first coat. At least one (1) coat shall be applied after the manhole has been constructed in the field, paying particular attention to the joints.

Manhole drops shall be constructed as shown on the plans and in the details in conformance with the applicable sections of these specifications.

Where called for on the plans, directed by the Engineer, or necessary for the new construction, existing manholes and pipe shall be modified as required. Modified joints and inverts in sanitary manholes shall conform with the pertinent sections of these specifications.

Manholes to be abandoned shall have the frame and cover removed and properly disposed of off-site. All pipes in the manhole shall be plugged with concrete. The Contractor may substitute bricks with permission of the Engineer. The existing manhole shall be removed to a level a minimum of two (2) feet below the surface. The remaining manhole structure shall be filled with sand and compacted. The remaining void shall be backfilled with granular fill to the subgrade elevation of the surface restoration treatment. The portions of the manhole removed shall not be used for any other Work performed on this project.

Manholes to be removed shall have all components of the manhole (i.e. frames and covers, cones, risers, base, etc.) removed and properly disposed of off-site. None of these components shall be utilized for any other work performed on this Project. The void left by the removal of the manhole shall be backfilled with granular fill and compacted.

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When directed by the engineer, frames and covers for new manholes located within limits of road reconstruction shall be temporarily set at the binder course elevation and raised to the final course elevation immediately prior to paving.

The Contractor shall furnish, put in place and maintain such excavation support systems (i.e. trench boxes, steel plates, steel sheeting, etc.) as may be necessary to support the sides of the excavation and to prevent any movement of earth other than that intended to be accomplished by the excavation. Trench support systems shall be designed to support earth pressures, hydrostatic pressures, equipment and construction loads, and other surcharge loads, to allow safe and expeditious construction with minimal movement or settlement of ground, to prevent damage to, or movement or settlement of, adjacent buildings, structures, or utilities. Such systems shall be installed as may be necessary for the protection of the Work and for the safety of personnel, and shall comply with the safety precautions as outlined in the Associated General Contractors of America, "Manual of Accident Prevention in Construction," the "Occupational Safety and Health Act" of 1970 (OSHA) of latest revision and OSHA Reference: U.S. Dept. Of Labor O.S.H.A. Safety and Health Standards (29 CFR 1926/1910) revised March 5, 1990, Subpart P-Excavations, Trenching & Shoring Selection of Protective Systems, 1926-652 Appendix F.

TESTING

Vacuum testing shall be performed on selected manholes at the direction of the Engineer after backfilling. If said testing indicates any problems, additional testing may be ordered by the Engineer. The Contractor shall have the option of pre-testing prior to backfilling to help facilitate repairs. However, this does not relieve the Contractor from testing after backfilling.

All lift holes shall be plugged with an approved non-shrink grout. All pipes entering the manhole shall be plugged, taking care to securely brace the plug from being drawn into the manhole.

The test head shall be placed at the inside of the top of the cone section and the seal inflated in accordance with the manufacturer's recommendations. A vacuum of ten (10) inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop nine (9) inches. The manhole will pass if the time is greater than sixty (60) seconds for 48" diameter and ninety (90) seconds for 72" diameter manholes.

If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout while the vacuum is still being drawn. Retesting shall proceed until a satisfactory test is obtained.

MEASUREMENT

"Sanitary Manholes" will be measured as the actual number of manholes of the size, type and depth specified, complete in place and accepted. Units measured under this item shall include both the installation of new manholes and the replacement of existing manholes. Flat top manholes and doghouse manholes will also be measured under this item. The depth of sanitary manholes shall be measured as the depth from the top of the roadway to the manhole invert.

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“Abandon Sanitary Manhole” will be measured as the actual number of manholes abandoned, complete in place and accepted.

“Remove Sanitary Manhole” will be measured as the actual number of manholes removed. Only manholes specifically called out on the Plans to be removed will be measured for payment under this item; existing manholes removed within the excavation limits of new pipe will not be measured for payment, but its costs are considered included in the unit price for “Sanitary Sewer Main”.

Connection of existing pipe to the manhole will not be measured separately but will be considered included in the contract unit price for “Sanitary Manhole” of the size and type specified.

The handling of existing sewage flows will not be measured for payment; but will be considered included in the contract unit price for “Sanitary Manhole” of the size and type specified.

Rock excavation will be measured for payment as described in the “Excavation” section of these Specifications.

Trench excavation, backfill, filter fabric and bedding material will not be measured for payment; the cost shall be considered as included in the contract unit price for “Sanitary Manhole” of the size and type specified.

Pipe, fittings and concrete for drop inlets will not be measured for separate payment; the cost shall be considered as included in the contract unit price for “Sanitary Manhole” of the size and type specified.

Pavement and lawn restoration will be measured as described in the pertinent section of these Technical Specifications.

Testing of manholes will not be measured for payment; the cost shall be considered as included in the contract unit price for “Sanitary Manhole” of the size and type specified.

Excavation support systems will not be measured for payment; the cost shall be considered as included in the contract unit price for “Sanitary Manhole” of the size and type specified or “Remove Sanitary Manhole”.

The backfilling of abandoned manholes with sand and granular fill will not be measured separately for payment; the cost shall be considered as included in the contract unit price for “Abandon Sanitary Manhole”.

PAYMENT

Sanitary sewer manholes will be paid for at the contract unit price each for “Sanitary Manhole” of the size, type and depth specified, complete in place which price shall include excavation, backfill, flexible joints, frame and cover, testing and handling of sewage flows, including all

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materials, equipment, tools, labor, and incidentals necessary to complete the Work.

Abandoned sanitary sewer manholes will be paid for at the contract unit price each for “Abandon Sanitary Manhole”, complete in place which price shall include excavation, backfill, removal and disposal of frame, cover and top of structure, and handling of sewage flows, including all materials, equipment, tools, labor, and incidentals necessary to complete the Work.

Removed sanitary sewer manholes will be paid for at the contract unit price each for “Remove Sanitary Manhole”, complete in place which price shall include excavation, backfill, removal and disposal of all components of existing manhole, and handling of sewage flows, including all materials, equipment, tools, labor, and incidentals necessary to complete the Work. Only manholes specifically called out on the Plans to be removed will be paid for under this item; existing manholes removed within the excavation limits of new pipe will not be paid for separately, but its costs are considered included in the unit price for “Sanitary Sewer Main”.

Connection of existing pipe to the manhole will not be paid for but will be considered included in the contract unit price for “Sanitary Manhole” of the size and type specified.

The handling of existing sewage flows will not be paid for; but will be considered included in the contract unit price for “Sanitary Manhole” of the size and type specified.

Rock excavation will be paid for as described in the “Excavation” section of these Specifications.

Trench excavation, backfill, filter fabric and bedding material will not be paid for separately; the cost shall be considered as included in the contract unit price for “Sanitary Manhole” of the size and type specified.

Pipe, fittings and concrete for drop inlets will not be paid for separately; the cost shall be considered as included in the contract unit price for “Sanitary Manhole” of the size and type specified.

Pavement and lawn restoration will be paid for as described in the pertinent section of these Technical Specifications.

Testing of manholes will not be paid for separately; the cost shall be considered as included in the contract unit price for “Sanitary Manhole” of the size and type specified.

Excavation support systems will not be paid for separately; the cost shall be considered as included in the contract unit price for “Sanitary Manhole” of the size and type specified or “Remove Sanitary Manhole”.

The backfilling of abandoned manholes with sand and granular fill will not be paid for separately; the cost shall be considered as included in the contract unit price for “Abandon Sanitary Manhole”.

SANITARY SEWER MANHOLES

<u>Pay Item</u>	<u>Pay Unit</u>
48" Sanitary Manhole (0'-10' Deep)	Each
48" Sanitary Manhole (10'-15' Deep)	Each
Abandon Sanitary Manhole	Each

SANITARY SEWER BYPASS SYSTEM

DESCRIPTION

“Sanitary Sewer Bypass System” shall consist of the furnishing of all equipment, labor, supervision, incidentals and material necessary for temporarily bypassing sanitary sewer flows around manholes, structures and piping by pumping as required for construction; to permit cleaning, testing, sealing; and to obtain other information necessary. This Work includes maintaining continuous and reliable wastewater service in all sewer pipes including individual service connections during construction.

Construction that may require a temporary sewer bypass systems includes, but is not limited to, wastewater pump station improvements; connections of new sewers to existing sewers; repair or replacement of existing sewers and structures; trenchless rehabilitation of existing sewers; and pipeline inspection.

Refer to the General Conditions elsewhere in these specifications for licensing requirements for any person involved in the installation of a sanitary sewer and/or appurtenances.

MATERIALS

To prevent the accidental spillage of wastewater flows, all discharge systems must be constructed of high density polyethylene (HDPE) pipe with fused joints or Quick Disconnect discharge pipe with positive restrained joints, and leak-proof connections. Discharge hose will only be allowed by specific permission from the Engineer.

HDPE bypass piping shall conform to the following requirements:

1. All HDPE pipes shall meet the requirements of ASTM F714. SDR rating of the pipe shall be sufficient to withstand the pressure and leakage test outlined herein.
2. HDPE Pipe shall be furnished in standard laying lengths not exceeding 50 feet.
3. Joining system: The HDPE pipe shall be joined with butt, heat fusion joints. All joints shall be made in strict compliance with the manufacturer’s recommendations and ASTM 2657. Where required, flange connections, mechanical joint connections and butt connections using bolted mechanical couplers shall be provided from a pipe stub with a polyethylene and steel stiffener. Flanged connections shall be provided from a pipe stub and a steel back-up flange. Back flanges shall be primed and painted in corrosion protected paint. Quick disconnect couplings will not be permitted on HDPE bypass piping.
4. HDPE fittings shall be fully pressure rated to match the pipe SDR pressure rating. All fittings shall be molded or fabricated by the same manufacturer as the pipe. HDPE fittings shall be joined using butt, heat fusion and/or electro-fusion. Adhesives and solvent cements shall not be permitted.

The Contractor that fuses the HDPE pipe must have a minimum of five (5) years of experience fusing HDPE pipe of the same diameter required for the project.

SANITARY SEWER BYPASS SYSTEM

PVC pipe with glued joints, aluminum “irrigation pipe”, steel pipe or PVC pipe with Dresser couplings will not be accepted.

All joints must be 100% restrained and all discharge pipes must have a minimum working pressure of 50 psi.

CONSTRUCTION DETAILS

Contractor shall supply pumps, pipes, power, fuel and all items required to bypass flow of sewage around the sewer system where Work is to be performed. It is the intent of these Specifications to require the Contractor to establish adequate bypass pumping as required regardless of the flow condition.

Contractor shall insert a plug or block the flow in pipes downstream of the bypass structure and connect pumps, hoses and any other equipment necessary to bypass flow around the existing sewer system as required for construction. Contractor shall make every effort to ensure the length of time the bypass system is operational is kept to a minimum.

During the bypass pumping operation, the Contractor shall undertake the necessary precautions to protect the existing sanitary sewer system from damage that might result from sewer surcharging. Discharge piping to gravity sewer systems shall be designed in such a manner as to prevent sewage discharge from contacting manhole walls or benches and full discharge shall go into downstream pipe with as minimal turbulence as possible. It may be necessary to remove the manhole cone to provide sufficient space for the bypass piping. If this is required, the Contractor shall be responsible for any damage to existing manhole components

Contractor shall undertake the necessary precautions to insure that flow control operations do not cause flooding or damage to public or private property. The Contractor is cautioned to monitor the upstream sewers for excessive surcharging which could cause flooding or damage. Monitoring methods include but are not limited to visually observing the flow in manholes upstream of the point of plugging.

The Contractor shall perform leakage and pressure tests of the bypass pumping discharge piping using clean water prior to the actual operation. The pressure and leakage test shall be conducted at one-and-a-half times the maximum pressure the system will experience based on the approved Bypass Pumping Plan for a period of two hours. No leakage is permitted during this test. The Engineer will be given 24 hours notice prior to testing. In addition, the Contractor shall demonstrate that the pumping system is in good working order and is sufficiently sized to successfully handle flows by performing a test run for a period of 24 hours prior to beginning construction activities in the bypassed areas of the sanitary sewer system.

Contractor shall provide primary bypass pumps that are critically silenced when used in residential settings or areas where excessive noise levels would create a disturbance as determined by the Engineer.

SANITARY SEWER BYPASS SYSTEM

Contractor shall provide a redundant bypass pump, intake and discharge conduit, and other equipment necessary to provide continuous bypass flow and prevent the backup of sewage within sanitary sewer mains and laterals at all times. Redundant bypass pumping does not have to be critically silenced.

Sanitary sewer flows shall only be bypassed around construction activities when authorized by the Engineer. Bypass pumping will only be allowed when adequate flow control cannot be obtained by plugging or blocking as determined by the Engineer.

The bypass system shall be of sufficient capacity to handle existing flows plus additional flow that may occur during a rainstorm.

The design, installation, operation and maintenance of all temporary pumping systems shall be the responsibility of the Contractor. The Contractor shall either sufficiently demonstrate ability, or employ the services of a subcontractor who can sufficiently demonstrate ability, to the Engineer that he specializes in the design and operation of temporary bypass pumping systems.

The Contractor responsible for the bypass system shall provide at least three (3) references for projects of similar size and complexity in wastewater applications performed within the past five (5) years. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction. The Contractor shall provide only competent personnel skilled in this type of work.

The Contractor shall provide on-site manual oversight of all bypass pumping operations 24 hours per day, 7 days per week when the bypass pumping system is in operation or provide a reliable SCADA system for continuous remote monitoring of the bypass system that is approved by the Engineer. The person responsible for monitoring shall be properly trained, experienced, and mechanically qualified such that they can quickly and effectively address any potential emergency and non-emergency situations associated with the pumps and bypass pumping system that must remain in operation for an extended period.

Contractor shall construct, maintain and repair all temporary sewer bypass systems and shall be responsible for preventing system backup and providing appropriate conditions for proper installation, rehabilitation, testing and inspection of sewers during construction. The Contractor shall immediately notify the Engineer if a sanitary sewer overflow (SSO) occurs and take the necessary action to clean up and disinfect the spillage to the satisfaction of the Engineer and/or other governmental agency. Any required repairs to bypass systems shall be immediately completed to prevent any overflows or backups within the sanitary sewer system.

The Contractor shall immediately remove and dispose of all offensive matter spilled during the bypass pumping and is solely responsible for all associated costs. The Contractor shall also be responsible for paying any fines imposed as a result of spills or overflows that occur as a result of the bypass pumping operations.

SANITARY SEWER BYPASS SYSTEM

The Contractor shall submit to the Engineer a sewer bypass schedule required to complete the Work. At a minimum, the schedule will include the proposed sequencing and coordination of wastewater pump station improvements, connections of new sewers to existing sewers, repair or replacement of existing sewers and structures, trenchless rehabilitation of existing sewers, pipeline inspection, and the handling of wastewater flow during all aspects of construction. The Engineer shall approve such schedule prior to implementation.

The Contractor shall prepare a specific, detailed description of the proposed pumping system (Bypass Pumping Plan.) The Bypass Pumping Plan shall be submitted and approved by the Engineer prior to the mobilization of any of the equipment included in the Bypass Pumping Plan. The Bypass Pumping Plan shall outline all provisions and precautions to be taken by the Contractor regarding handling of existing wastewater flows. This Bypass Pumping Plan must be specific and complete, including such items as schedules, locations, elevations, capacities of equipment, materials, and all other incidental items necessary and/or required to ensure proper protection of the facilities, including protection of bypass pumping locations from damage in compliance with the requirements and permit conditions specified herein. No construction shall begin until all provisions and requirements have been reviewed and accepted by the Engineer.

The plan shall include, but is not limited to, the following details:

1. Staging areas for pumps.
2. Sewer plugging method, types of plugs and proposed plug locations that will not cause adverse impacts upstream.
3. Size and location of manholes or access points for suction and discharge hose or piping.
4. Size of pipeline or conveyance system to be bypassed.
5. Number, size, material, location and method of installing suction piping.
6. Number, size, material, location and method of installing discharge piping.
7. Bypass pump sizes, capacities, and number of each size pump to be provided on-site including all primary, secondary, and spare pumping units.
8. Calculations of static lift, friction losses, and flow velocity. Pump curves showing pump operating range shall be submitted.
9. Downstream discharge plan.
10. Method of protecting discharge manholes or structures from damage.
11. Thrust and restraint block sizes and locations. Provide the details necessary to demonstrate the integrity of all suction and discharge piping including piping and fittings associated with all primary and secondary pumping units.
12. Section views showing suction and discharge pipe depth, embedment, select fill and special backfill.
13. Standby power generator size and location.
14. Method of noise control for each pump and any additional equipment that is included in the Bypass Pumping Plan.
15. Any temporary pipe supports and anchoring requirements.
16. Access plans to all bypass pumping locations indicated on the drawings.

SANITARY SEWER BYPASS SYSTEM

17. Calculations for selection of bypass pumping pipe size.
18. Schedule for installation of and maintenance of bypass pumping pipes.
19. Plan indicating location of bypass pumping pipe locations.
20. Emergency plan for adverse weather and flooding for various phases of the Work.
21. Contractors plan for providing continuous monitoring of the bypass pumping operation as well as the monitoring person's qualifications and detailed information for the proposed monitoring system.

Sewage flows from private, commercial, and industrial users shall be handled by the Contractor during the Work without interruption.

The Contractor shall be required to repair, at his own expense, any damage to public or private property caused by his operations.

Should damage of any kind occur to the existing sanitary sewer system, the Contractor shall, at his own expense, make repairs to the satisfaction of the Engineer.

The Contractor shall not be permitted to overflow, bypass, pump or by any other means convey sewage to any land, street, storm drain, wetland, waterbody or watercourse.

The Contractor shall cease bypass pumping operations and return flows to the new and/or existing sewer when directed by the Engineer. During bypassing, no wastewater shall be leaked, dumped, or spilled in or onto any area outside the existing wastewater system. When bypass operations are complete, all bypass piping shall be flushed with fresh water and drained into the wastewater system prior to disassembly.

The Contractor shall establish adequate bypass pumping adherent to the conditions above and anticipate severe weather conditions and increases in peak flows during rain events. Available flow and capacity data for Contractor's use in sizing equipment is as follows:

Pipe Size/Location	Average Daily Flow (<i>mgd</i>)	Peak Hour Flow (<i>mgd</i>)
6" VCP located on Spruce St. upstream of SMH #17	+/- 0.006	+/- 0.025
6" VCP located on Pearl St. upstream of SMH #17	+/- 0.02	+/- 0.08

Contractor shall identify all areas requiring sewer bypass for completion of the work and notify the Engineer. Approximate sanitary flows within other areas of the sewer system that require bypass for the completion of work will be provided by the Engineer for development of the Bypass Pumping Plan.

SANITARY SEWER BYPASS SYSTEM

The Contractor shall keep records of all bypass pumping performed. The records shall identify the name of the project; Contractor's name; pump intake location, discharge location, pumping equipment used, pipe size and length of sewer system that was bypassed; dates and beginning and ending times; and any special remarks concerning the operation. Four (4) copies of each record shall be submitted daily to the Engineer upon completion of the bypass pumping operation.

MEASUREMENT

“Sanitary Sewer Bypass System” will not be measured separately for payment, the cost shall be considered as included in the “Sanitary Sewer”, “Sanitary Manhole”, “Sanitary Sewer Lateral” and “Relocate Sanitary Sewer Lateral” sections of these Technical Specifications.

PAYMENT

“Sanitary Sewer Bypass System” will not be measured separately for payment, the cost shall be considered as included in the “Sanitary Sewer”, “Sanitary Manhole”, and “Sanitary Sewer Lateral” sections of these Technical Specifications.

WATER SERVICE

DESCRIPTION

“Copper Service” of the size specified, includes the furnishing and installation of new water services from the water main to and including the curb box where shown on the plans or as directed by the Engineer. It includes, but is not limited to, furnishing and installing corporation stops, service saddles, curb stops, curb boxes and copper tubing; testing and disinfection; tapping of the water main; abandonment or removal of existing service; and excavation and backfill.

“Copper Service to Building/Replumb Meter” of the size specified, includes the furnishing and installation of new copper tubing from the curb box to the water meter where shown on the plans or as directed by the Engineer. It includes, but is not limited to, relocating and replumbing existing water meter within existing buildings as necessary to connect new copper tubing, abandonment of existing water service entrance into basement as directed by the Engineer, testing and disinfection, abandonment or removal of existing water service from curb box to water meter; and excavation and backfill.. It also includes, but is not limited to, securing a “Building Permit” for the work internal to the building.

“Reconnect Copper Service” includes reconnecting 1” and 2” existing services to a new water main. Existing ¾” services shall not be reconnected and shall be replaced with a new 1” Copper Service or as directed by the Engineer. It includes, but is not limited to furnishing and installing corporation stops and service saddles; tapping of water main; abandonment or removal of existing service (between old main and new main); excavation and backfill; and extension of existing copper services to a new main with the use of couplings only where approved by the Engineer.

“Abandon Water Service” includes the abandoning of existing water services **only where specifically shown on the Plan**. It is intended to be used only where the existing service to be abandoned is not located close to the new service being installed or the existing service to be abandoned is no longer required. Abandoning or removing existing services located within the trench excavation limits for new services will not be measured separately for payment, but its costs shall be considered as included in the unit price bid for “Copper Service” of the size specified or “Copper Service to Building/Replumb Meter” of the size specified.

“Abandon Water Service in Building” shall consist of the abandonment of existing water service pipes within building structures by furnishing and installation all required fittings, valves and other appurtenances, removing pipes, supporting pipes to remain and capping pipe ends as directed by the Engineer.

“Replace Center Nut Curb Box” includes the furnishing and installation of new curb boxes as directed by the Engineer. It includes, but is not limited to, removal of existing center nut curb box; and excavation and backfill.

Refer to the General Conditions elsewhere in these specifications for licensing requirements for any person involved in the installation of a water main and/or appurtenances.

WATER SERVICE

The Engineer shall be notified immediately if any existing antiquated lead tubing water services are found during the Work. The lead water service will be replaced under this Technical Specification as directed by the Engineer.

MATERIALS

- Corporation Stop:** Corporation Stops shall have a male iron pipe thread inlet, pack or quick joint connection for copper tubing outlet, a ball style valve, and shall meet the requirements of ANSI/AWWA C800 with latest revisions. Brass shall be “no-lead brass” meeting the requirements of USEPA’s Reduction of Lead in Drinking Water Act. The corporation stop shall be a one (1) inch or two (2) inch: Model No. FB1100-4-NL, FB1100-4-Q-NL, FB1100-7-NL or FB1100-7-Q-NL as manufactured by the Ford Meter Box Co., Inc., Wabash, IN.; Model No. P-25028N or B-25028N as manufactured by Mueller Co., Decatur, IL.; or Model No. NL 74704B-22, NL 74704BT or NL 74704BQ as manufactured by A.Y. McDonald Mfg. Co., Dubuque, IA.
- Service Saddle:** The service saddle shall have a double strap with a one (1) inch iron pipe thread tapping, and shall be one of the following: Model FCD202 manufactured by the Ford Meter Box Company, Inc., Wabash, Indiana, Model JCM 406 by JCM Industries, Inc., Nash, Texas, Model 317 by Smith-Blair, Inc., Texarkana, Arkansas, or Model 202NS by Romac Industries, Inc., Bothell, WA.
- Copper Tubing:** Water service lines shall be Type K seamless copper tubing of one (1) inch or two (2) inch nominal diameter. Tubing shall meet the requirements of ASTM Specification B 88 of latest revision.
- Couplings:** Couplings for reconnecting existing ¾”, 1”, 1¼”, 1½” and 2” copper, brass or galvanized steel services shall be compression couplings meeting the requirements of ANSI/AWWA C800 with latest revisions. Brass shall be “no-lead brass” meeting the requirements of the USEPA’s Reduction of Lead in Drinking Water Act. Couplings shall be Model No. C44-XX-NL or C44-XX-Q-NL as manufactured by Ford Meter Box Co., Inc., Wabash, IN.; Model No. P-15403N or H-15403N as manufactured by Mueller Co., Decatur, IL.; Model No. 74758-22, 74758T or 74758Q as manufactured by A.Y. McDonald Mfg. Co., Dubuque, IA. Couplings used for connections to other pipe sizes and materials shall be approved by the Engineer.
- Curb Stop:** Curb Stops shall meet the requirements of ANSI/AWWA C800 with latest revisions. Brass shall be “no-lead brass” meeting the requirements of the USEPA’s Reduction of Lead in Drinking Water Act. The curb stop shall be a one (1) inch or two (2) inch: Model No. B44-444-NL, B44-444-Q-NL, B44-777-NL or B44-777-Q-NL as manufactured by Ford Meter Box

WATER SERVICE

Co., Inc., Wabash, IN.; Model No. P-25209N or B-25209N as manufactured by Mueller Co., Decatur, IL.; or Model No. 76100-22, 76100T or 76100Q as manufactured by A.Y. McDonald Mfg. Co., Dubuque, IA.

- Curb Box:** The curb box shall be the extension type with a 42" or 45" stationary rod. Box shall be adjustable from 4' to 5' and be provided with a foot piece for 2" services. Curb boxes shall be manufactured in North America by Mueller, Ford, A.Y. McDonald, Sames, Trumball, Bibby St. Croix, Fonderie La Roche or approved equal. Only curb boxes manufactured in North America will be accepted. The upper sections of slide type curb boxes shall have drop type cover with the word "WATER" or "W" cast on top and shall be a 2-hole Erie style. Valve boxes shall be installed for curb boxes located in paved areas and sidewalk, and for blow offs, and shall meet the requirements of "Valve Boxes" as defined in the pertinent sections of these Specifications.
- Backflow Preventer:** Backflow preventers shall be Watts Series 009 with air gap assembly or approved equal.
- Pavement Markings:** Pavement markings installed to replace disturbed markings shall be painted, match the size and color of existing markings, and meet the requirements of "Painted Pavement Markings" as defined in the pertinent sections of these Specifications.

CONSTRUCTION DETAILS

The Contractor shall be responsible for all materials and work required for water service installations, but he will coordinate all activities with the Manchester Water Department. When temporary discontinuance of service is required to accomplish service replacement, the Contractor shall notify the customer and the Manchester Water Department two (2) full work days in advance of the discontinuance. He shall have all materials on hand necessary to do the work and shall perform as much excavation and installation of new materials as possible in advance to minimize the time water will be shut off.

Trench excavation, backfill, testing, disinfection and surface restoration required for water service installation shall be carried out in accordance with the pertinent section of these Technical Specifications.

Tapping ductile iron pipe, installation of corporation stops, curb stops, curb boxes and backflow preventers, and appurtenant work, shall be done in conformity with manufacturer's recommendations and accepted best practice and shall be subject to approval by the Engineer.

Valve boxes shall be installed for curb boxes located in paved areas and sidewalk, and for blow offs, and shall be installed as specified for "Valve Boxes" as defined in the pertinent sections of these Specifications.

WATER SERVICE

Copper tubing shall be installed as indicated on the plans and in accordance with the pertinent sections of these Technical Specifications. There shall be no couplings installed on the water service between the water main and the building being served unless approved otherwise by the Engineer.

The location of couplings installed on the water service shall be approved by the Engineer prior to installation. Couplings shall not be located below any building or structure foundation, sidewalk, steps, decks or in other locations that may inhibit access to the water service for future maintenance and repair.

Where existing water services are to be replaced in place, the Contractor shall have the option of pulling the new copper service through the existing service. The copper service pipe which is pulled shall be a continuous length of pipe; no couplings shall be utilized to join together two or more lengths of pipe which are to be pulled. Any service which has been installed by pulling shall be subjected to a pressure test of 150 psi for 15 minutes prior to acceptance. Methodology for installation shall be approved by the Engineer.

Where existing water services are to be replaced, the existing curb stop shall be replaced, and a new copper service installed to the new water main at a minimum depth of 4.5 feet as indicated on the plans.

Where excavations are to be made in grass covered areas, loam and topsoil shall be carefully removed and separately stored to be used again. If the Contractor prefers not to separate surface materials he shall furnish, as directed by the Engineer, loam and topsoil at least equal in quality to that excavated.

The Contractor shall be fully responsible for damage done to trees and shrubs as a result of this work. It shall be the Contractor's responsibility to preserve existing trees and shrubs, including those temporarily removed where necessary. All trees and shrubs that are removed, killed, or that have, in the opinion of the Engineer, suffered significant permanent damage shall be replaced, at no additional costs, in an acceptable manner with trees or shrubs approved by the Engineer.

Where it appears as though permanent damage to existing trees and shrubs is unavoidable, the Contractor may petition the Engineer to request moving the curb stop and box from the location specified. The Contractor shall not be allowed to vary the curb stop and box location from that specified herein and as shown on the Plans without specific permission of the Engineer.

Where existing water services are to be abandoned, the existing corporation stop shall be closed and the existing pipe shall be disconnected from the corporation stop.

Reconnection of existing copper services shall apply to 1" or 2" services only. Existing ¾" services shall not be reconnected and shall be replaced with a new 1" Copper Service or as directed by the Engineer. Any reconnection shall consist of the tapping of a new corporation in accordance with the pertinent sections of these Technical Specifications. Whenever possible, the

WATER SERVICE

existing copper tubing shall be reused for reconnection to the new corporation. If for any reason the existing copper cannot be reused without the insertion of a coupling, the Engineer shall be notified immediately.

Reconnection of existing copper services shall also include installing copper tubing and couplings to extend existing copper services that are deemed to be in good condition from the old main to the new main. This work shall only be allowed where approved by the Engineer.

The Contractor will be responsible for obtaining a “Building Permit” from the Town of Manchester Building Department for work associated with the items “Copper Service” and “Copper Service to Building/Replumb Meter”.

MEASUREMENT

“Copper service” of the size specified will be measured for payment as a unit, complete and accepted. Measurement will include tapping the water main, furnishing and installing a service saddle, corporation stop, copper tubing, curb stop, curb box and making connection to the existing service, if required. It shall include all fittings, adapters and other appurtenant material necessary to complete the Work. Protection, removal and replacement of existing features such as, but not limited to, walls, fences, trees, shrubs and plants required for installation of water services will not be measured for payment; the cost will be considered to be included in the contract unit price for “Copper Service” of the size specified.

“Copper service to Building/Replumb Meter” of the size specified will be measured for payment as a unit, complete and accepted. Measurement will include furnishing and installing new copper tubing and fittings; and relocating and replumbing existing water meter within existing buildings as necessary to connect new copper services. It shall include all fittings, adapters and other appurtenant material necessary to complete the Work. Protection, removal and replacement of existing features such as, but not limited to, walls, fences, trees, shrubs and plants required for installation of water services will not be measured for payment; the cost will be considered to be included in the contract unit price for “Copper service to Building/Replumb Meter” of the size specified.

“Reconnect Copper Service” will be measured for payment as a unit, complete and accepted. Measurement will include tapping the water main, furnishing and installing copper tubing and a service saddle, corporation stop and connection to the existing service. It shall include all fittings, adapters and other appurtenant material necessary to complete the Work.

“Abandon Water Service” will be measured by the unit **only at locations shown on the Plan**. Abandoning of services located within the trench excavation limits for new services will not be measured for payment, but its cost shall be considered as included in the unit price bid for “Copper Service” or “Copper Service to Building/Replumb Meter” of the size specified.

“Abandon Water Service in Building” will be measured by the unit **only at locations shown on the Plan**, complete and accepted.

WATER SERVICE

“Replace Center Nut Curb Box” will be measured for payment as a unit, complete and accepted. Measurement will include furnishing and installing a curb box. It shall include all components and other appurtenant material necessary to complete the Work.

Trench excavation and backfill, testing, disinfection, trench support systems, and protection of trees and shrubs will not be measured for payment; the cost shall be considered as included in the unit price for “Water Service” of the size and type specified.

Rock in trench excavation will be measured for payment as described in the “Excavation” section of these Technical Specifications.

Surface restoration will be measured for payment as described in the pertinent section of these Technical Specifications.

Pavement markings installed to replace disturbed markings will not be measured separately for payment; the cost shall be considered as included in the contract unit price bid for “Copper Service” and “Reconnect Copper Service” of the size and type specified, and for “Abandon Service”.

PAYMENT

“Copper Service” of the size specified will be paid for at the contract unit price for each service installed, which price shall include tapping water main, service saddle, corporation stop, copper tubing, curb stop, curb box, backflow preventer and connection to existing service (if required), and all materials, equipment, tools, labor and incidentals necessary to complete the Work. This price shall also include protection, removal and replacement of existing features such as, but not limited to, walls, fences, trees, shrubs and plants required for installation of copper service of the size specified.

“Copper service to Building/Replumb Meter” will be paid for at the contract unit price each for "Copper Service to Building/Replumb Meter" of the size specified, which price shall include furnishing and installing new copper tubing and fittings; backflow preventer (if required) and relocating and replumbing existing water meter within existing buildings as necessary to connect new copper services, abandonment of existing water service entrance in basement as directed by the Engineer, and all materials, equipment, tools, labor and incidentals necessary to complete the Work. This price shall also include protection, removal and replacement of existing features such as, but not limited to, walls, fences, trees, shrubs and plants required for installation of copper service of the size specified.

“Reconnect Copper Service” will be paid for at the contract unit price for each reconnection, which price shall include tapping water main, furnishing and installing copper tubing, service saddle, corporation stop, bushings, couplings (only where approved by the Engineer), connection to the existing service and all materials, equipment, tools, labor and incidentals necessary to complete the Work.

WATER SERVICE

“Abandon Water Service” will be paid for at the contract unit price each for abandonment **only at locations shown on the Plan**, which price shall include excavation, backfill, closing the existing corporation stop and disconnecting the existing service pipe from the corporation stop and all materials, equipment, tools, labor and incidentals necessary to complete the Work. Abandoning of services located within the trench excavation limits for new services will not be paid for separately; the cost shall be considered as included in the unit price bid for “Copper Service” or “Copper Service to Building/Replumb Meter” of the size specified.

“Abandon Water Service in Building” will be paid for at the contract unit price each for abandonment within a building structure **only at locations shown on the Plan**, which price shall include furnishing and installation all required fittings, valves and other appurtenances, removing pipes, supporting pipes to remain and capping pipe ends as directed by the Engineer and all materials, equipment, tools, labor and incidentals necessary to complete the Work.

“Replace Center Nut Curb Box” will be paid for at the contract unit price for each curb box replaced, which price shall include furnishing and installing curb box and all materials, equipment, tools, labor and incidentals necessary to complete the Work.

Trench excavation and backfill, testing, disinfection, trench support systems, and protection of trees and shrubs will not be paid for separately; the cost shall be considered as included in the contract unit price for “Copper Service” and “Copper Service to Building/Replumb Meter” of the size specified.

Pavement markings installed to replace disturbed markings will be considered as included in the contract unit price bid for “Copper Service” and “Reconnect Copper Service” of the size and type specified, and for “Abandon Service”.

<u>Pay Item</u>	<u>Pay Unit</u>
1” Copper Service	Each
1” Copper Service to Building/Replumb Meter	Each
Reconnect Copper Service	Each
Replace Center Nut Curb Box	Each

WATER MAIN

DESCRIPTION

“Water Main” of the size and type specified shall consist of the furnishing and installation water pipe; and disinfection, flushing and testing of all ductile iron water pipe, fittings, valves, joint restraint and other appurtenances as indicated on the Plans or directed by the Engineer. Placement and compaction of backfill, filter fabric, bedding material, trench support systems, abandonment of existing water mains, valves, blow-offs, and salvage of indicated items shall also be included as part of this item. Existing water mains located within the excavation limits of new main will not be measured separately for payment, but shall be considered as included in the unit price bid for the new water main.

Fittings, valves and joint restraints of the size and type specified shall consist of furnishing and installing these appurtenances where shown on the plans or as directed by the Engineer.

“Cut and Cap Water Main” shall include excavation; cutting and capping of existing pipe to remain in service; and backfilling where shown on the plans or as directed by the Engineer.

Refer to the General Conditions elsewhere in these specifications for licensing requirements for any person involved in the installation of a water main and/or appurtenances.

MATERIALS

Unless otherwise specified by the Engineer, the pipe, fittings, valves and appurtenances to be utilized in this work shall be new and unused, shall be of the types and materials specified herein and shall meet the requirements specified herein. All material found during the progress of the work to have cracks, flaws or other defects will be rejected by the Engineer. All defective materials shall be promptly removed from the work site and replaced at no additional expense to the Town.

Ductile Iron Pipe: Ductile iron pipe shall meet the requirements of the latest revision of AWWA C151 (ANSI A21.51). Joints shall be “Tyton Joint” or “Fastite Joint” design, rubber gasket push-on type manufactured in accordance with the latest revision of AWWA C111 (ANSI A21.11). Pipe shall be supplied with the standard exterior bituminous coating of either coal tar or asphalt base approximately one mil thick. The interior shall be double cement lined in accordance with the latest revision of AWWA C104 (ANSI A21.4), and pipe shall be of thickness Class 52 unless otherwise indicated. Pipe shall be manufactured by Griffin, U.S. Pipe, McWane Ductile, American or approved equal.

Joint Restraint: Restrained bell and spigot push on joints for ductile iron pipe shall meet the requirements of the latest revision of AWWA C151 (ANSI A21.51). Each restrained bell and spigot joint shall be achieved using a single rubber FIELD LOK 350 gasket, a Series 1700 Megalug push on pipe bell restraint harness as manufactured by Ebaa Iron, Inc., Eastland, Texas, a Fast-Grip Gasket, or approved equal, manufactured in accordance with the

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latest revision of AWWA C111 (ANSI A21.11). The bell and spigot push on joint restraint provided shall be sufficient to restrain working pressures of 350 psi.

Mechanical joint thrust restraining glands, for valves and fittings, shall be the Megalug Series 1100, manufactured by Ebaa Iron, Eastland, Texas, Ford series 1400, or approved equal.

Tiebolts, tiebolt nuts, rod couplings, threaded rods and rod nuts, retainer clamps, and round flat washers may be used for restrained joints and shall be steel meeting the requirements of ASTM A 36-77a. These components shall be similar or equal to the following figure numbers manufactured by Star National Products.

<u>ITEM</u>	<u>STAR FIGURE</u>
Tiebolt	7, 7-5, or SST 7
Tiebolt and Rod Nut	8
Rod Coupling	10
Retainer Clamp	11
Threaded Rod	12
Round Flat Washer	17

Gate Valves:

All gate valves shall be resilient wedge gate valves and shall meet the requirements of AWWA C515 of latest revision. The valve body, bonnet, stuffing box and operating nut shall be composed of ASTM A536 ductile iron. The body and bonnet shall adhere to the minimum wall thickness as set forth in AWWA C515-09 Table 2, Section 4.4.1.2. Wall thicknesses that do not meet AWWA minimums are not acceptable. Valves shall have non-rising stems, mechanical joint ends meeting the requirements of AWWA C111 of latest revision and have O-ring stem seals. Each valve shall be supplied with two (2) sets of mechanical joint retainer glands. Valves shall be wrench-operated and rated at a minimum working pressure of 200 psi. **Valves shall be right opening (clockwise) or left opening (counterclockwise) as indicated on the plans or as directed by the Engineer, which is dependent on where they are located in Town.**

Wedge shall be encapsulated in EPDM rubber per AWWA C515. Valve shall be coated with a fusion bonded epoxy-resin both inside and outside. Coating shall be a minimum of 10 mils thick and be in full compliance with (i.e. meet or exceed) all requirements of the latest revision of AWWA C550. All exterior nuts and bolts shall be 5/8" minimum diameter and shall be Type 18-8, Series 300, stainless steel at a minimum.

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Resilient wedge gate valves shall be only those models and manufacturers listed below.

<u>Manufacturer</u>	<u>Model</u>
American Flow Control	Series 2500
AVK	Series 65
Clow	2638
M & H	Style 7000
Mueller	A-2361
U.S. Pipe	A-USP1

Butterfly Valves: Valves shall be wrench operated, non-rising stem with O-ring stem seals and have mechanical joints on both ends. Each valve shall be supplied with two (2) sets of mechanical joint retainer glands. Valves shall meet or exceed the requirements of the latest revision of AWWA C504. Valves shall have epoxy coated cast iron bodies with mechanical joint ends complying with the latest revisions of ANSI A21.11 (AWWA C111). Valves shall be a minimum Class 150B and suitable for a maximum nonshock shutoff pressure of 140 psi. The valves shall provide bubble-tight shutoff at 150 psi when tested in accordance with AWWA C504. Valve discs shall seat at an angle of 90 degrees to the axis of the pipe.

Valve seats shall be molded natural rubber. Rubber seats may be attached to the body or the disc. If the rubber seat is attached to the disc, the seat ring on the body shall be of stainless steel. The valve disc shall be of either case Ni-Resist or cast iron Class 40 conforming to ASTM A48. Rubber seats mounted on the disc shall be securely clamped to the disc. All clamps, retaining rings, and their fasteners shall be Series 300 stainless steel.

The valve shaft shall be Type 300 stainless steel or carbon steel with stainless steel joints. The valve disc and shaft connection shall be by means of mechanically secured taper pins extending through the disc and shaft. Taper pins, lockwashers and nuts shall be 18-8 stainless steel. The shaft seals shall be designed for the use of standard "O" -ring seals.

The manual operating mechanism shall be firmly fixed to the valve body and shall be rated at 450 lb. The operator shall be permanently lubricated, shall be totally enclosed with a cast iron case. The operator shall be suitable for submersion. The operator shall have adjustable threaded collars at each end of stroke. **Valves shall be right opening (clockwise) or left opening (counterclockwise) as indicated on the plans or as directed by the Engineer, which is dependent on where they are located in Town.**

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Butterfly Valves shall be only those models and manufacturers listed below.

<u>Manufacturer</u>	<u>Model</u>
Mueller	Lineseal III
M & H	Style 450

Tapping Sleeve and

Valve TYPE I (CIP): Tapping sleeves shall consist of a full body two-piece ductile iron or cast iron sleeve/tee with mechanical joint ends on the run and a flanged end on the branch. Each sleeve shall be supplied with two (2) sets of mechanical joint retainer glands. Tapping valves shall be resilient wedge gate valves meeting the requirements described below. The tapping valve shall have one flanged end and one mechanical joint end.

Valves shall be wrench operated, non-rising stem with O-ring stem seals. Each valve shall be supplied with one (1) set of type I-Mechanical Joint Retainer Glands. **Valves shall be right opening (clockwise) or left opening (counterclockwise) as indicated on the plans or as directed by the Engineer, which is dependent on where they are located in Town.**

Wedge shall be encapsulated in molded rubber.

Valve shall be coated with a fusion bonded epoxy-resin both inside and outside. Coating shall be a minimum of 10 mils thick and be in full compliance with (i.e. meet or exceed) all requirements of the latest revision of AWWA C550.

Valves and joints shall be in full compliance with (i.e. meet or exceed) all requirements of the latest revision of AWWA C515 and AWWA C111 respectively.

Valves shall be only those models and manufacturers listed below.

<u>Manufacturer</u>	<u>Model</u>
American Flow Control	Series 2500
AVK	Series 65
Clow	2638
M & H	Style 7000
Mueller	A-2361
U.S. Pipe	A-USP1

Tapping sleeves shall be manufactured by U.S. Pipe, Mueller, American Flow Control or approved equal.

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Tapping Sleeve and

Valve TYPE II (DIP): Tapping sleeve shall consist of a stainless steel body with either a stainless steel or carbon steel integral mechanical joint outlet flange. Gasket shall be full circumference. Tapping valves shall be resilient wedge gate valves meeting the requirements described below. The tapping valve shall have mechanical joint ends.

Valves shall be wrench operated, non-rising stem with O-ring stem seals. Each valve shall be supplied with two (2) sets of mechanical joint retainer glands. **Valves shall be right opening (clockwise) or left opening (counterclockwise) as indicated on the plans or as directed by the Engineer, which is dependent on where they are located in Town.**

Wedge shall be encapsulated in molded rubber.

Valve shall be coated with a fusion bonded epoxy-resin both inside and outside. Coating shall be a minimum of 10 mils thick and be in full compliance with (i.e. meet or exceed) all requirements of the latest revision of AWWA C550.

Valves and joints shall be in full compliance with (i.e. meet or exceed) all requirements of the latest revision of AWWA C515 and AWWA C111 respectively.

Valves shall be only those models and manufacturers listed below.

<u>Manufacturer</u>	<u>Model</u>
American Flow Control	Series 2500
AVK	Series 65
Clow	2638
M & H	Style 7000
Mueller	A-2361
U.S. Pipe	A-USP1

Tapping sleeves shall be only those models and manufacturers listed below.

<u>Manufacturer</u>	<u>Model</u>
Ford	FAST-MJ
JCM	439 or 469
Smith-Blair	662-MJ or 663-MJ

Blow offs: Blow offs shall be 2" in diameter with a 30" pipe length, as manufactured by Wedge Manufacturing, Ansonia, CT., or approved equal.

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- Valve Boxes: Valve boxes shall be 5-1/4", consisting of a base and adjustable slide type top section with top flange and cover that is adjustable from 4' to 5'. Valve boxes shall be made of centrifugally spun iron with 1/4" uniform wall thickness. Box cover shall have the word "WATER" cast on top. Valve boxes shall be coated with heavy bituminous coating and be manufactured in the United States or Canada by Water Quality Products, Bibby Ste. Croix, Charlotte, Tyler, Bingham and Taylor, or approved equal.
- Fittings: Fittings, including mechanical joint plugs and caps, shall be ductile iron meeting the requirements of AWWA C110 (ANSI A21.10) with mechanical joints in conformance with AWWA C111 (ANSI A21.11). Fittings shall have a minimum pressure rating of 350 psi and shall have an inside lining of cement-mortar in accordance with AWWA C104 (ANSI A21.4). Compact fittings meeting the requirements of AWWA C153 (ANSI A21.53) of latest revision may be used. Fittings shall have an asphalt coating both inside and outside, and be manufactured in the United States or Canada by Griffin, Tyler, U.S. Pipe, Sigma, Clow, Union or approved equal.
- Sleeves: Sleeves for connecting new mains to existing mains shall be mechanical joint solid sleeves with the mechanical joint ends restrained by the means of retainer glands. Solid sleeves shall meet the requirements of the latest revision of AWWA C110 (ANSI A21.10) and shall be Model F-1014 as manufactured by the Clow Corporation, Oak Brook, Illinois, or approved equal.
- Connecting sleeves for connecting new water mains to existing metal lined cement mains (stovepipe) shall be Model 227 as manufactured by Rockwell, Pittsburgh, PA or approved equal.
- Couplings: Couplings for connecting new main to oversized cast iron pipe shall be Rockwell Model 441 Cast Transition Couplings, or approved equal. These couplings shall be used only when oversized cast iron pipe is encountered which does not allow the use of solid sleeves.
- Concrete: Concrete for thrust blocks, pipe cradles, sealing abandoned pipe, etc., shall conform to the requirements of the pertinent section of these Specifications.
- Polyethylene Wrap: Polyethylene wrap for fittings with poured concrete thrust blocks shall meet the requirements for the latest revision of AWWA C105.
- Pipe Insulation: Insulation boards for water main pipe shall be closed cell, extruded polystyrene foam meeting ASTM C578, manufactured by Thermal Foams

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Inc., Buffalo, NY., or 2" thick Cellular Glass Insulation meeting the requirements of the latest revision of ASTM C552 with an aluminum jacket. Insulation shall be Foamglas Cellular Glass manufactured by Pittsburgh Corning, Pittsburgh, PA., or approved equal.

- Bedding Material: Bedding material shall be as indicated on the Plans and shall meet the requirements of Article M.08.01-21 for sand, Article M.02.01-1 for crushed stone, and Article M.02.01-2 (Grading "C") of Form 817 for bank run gravel.
- Backfill: Backfill material above bedding material shall be suitable material from the excavation which is free from large or frozen lumps of soil, wood or other extraneous material or, if directed by the Engineer, shall be approved backfill material meeting the requirements of Article M.02.06 (Grading "B") of Form 817.
- Filter Fabric: Filter fabric shall be a non-woven fabric similar or equal to Mirafi 140 as manufactured by Celanese Fibers Marketing Company, Bidim C22 as manufactured by Monsanto Textiles Company or approved equal.
- Warning Tape: Underground pipe warning (marking) tape shall be plastic and metallic-coated to permit detection by a magnetic sensing device. The tape shall be blue in color, not less than 3 inches in width, and shall have the words "CAUTION - BURIED WATER MAIN BELOW" repeated along the full length of the tape in letters not less than 1" high permanently fused into the tape. Pipe marking tape shall be "Terra-Tape" detectable pipe marking tape as manufactured by Reef Industries, Inc., Houston, Texas or approved equal.
- Steel Sheeting: Steel sheeting for trench stabilization, if required, shall conform to the requirements of ASTM A328, ASTM A572 or ASTM A690 as appropriate.
- Pavement Markings: Pavement markings installed to replace disturbed markings shall be painted, match the size and color of existing markings, and meet the requirements of "Painted Pavement Markings" as defined in the pertinent sections of these Specifications.

CONSTRUCTION DETAILS

General

Trench excavation and surface restoration shall conform to the requirements of the pertinent section of these Specifications. Water mains shall only be installed in trench conditions; embankment conditions will not be permitted.

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Ductile iron pipe, fittings and valves shall be installed as detailed and directed, and in full accordance with the latest revision of AWWA C600, manufacturer's recommendations, and accepted best practice, with the below listed qualifications and clarifications. The methods employed in performing the work, and all equipment, tools and machinery used in handling material and executing any part of the work shall be subject to the approval of the Engineer before the work is started and, whenever found unsatisfactory, shall be changed and improved as required by the Engineer. All equipment, tools and machinery used shall be maintained in a satisfactory working condition.

It shall be the responsibility of the Contractor to coordinate his work schedule, where required, with that of the Manchester Water Department through the Engineer. The Contractor shall provide a minimum seventy-two (72) hour notice for all water main shutdowns required to complete the proposed work.

At all installations where connection is to be made by gating off sections of main which are normally open, the excavation may be required to be made the day before work is to start on the installation with all material on hand. The work shall be done as quickly as possible so that normal operation of the system will be interrupted a minimum amount of time. Any required operating of valves for this work will be performed by personnel of the Manchester Water Department, and ample notice shall be given to the Engineer so that a minimum of two (2) full working days notice may be given to any user whose service will be discontinued for any reason. **BECAUSE OF THE NATURE AND SCHEDULES OF CERTAIN CUSTOMERS, IT MAY BE NECESSARY FOR WORK TO BE DONE OUTSIDE OF NORMAL WORKING HOURS IF SERVICE INTERRUPTION IS REQUIRED.** The Contractor shall be responsible for coordinating his work with said customers and the Manchester Water Department with the approval of the Engineer. If the work extends beyond normal working hours of the Water and Sewer Department, the Contractor shall be responsible for paying Department employees at their prevailing overtime wage rate, as well as prevailing usage rate for vehicles and other equipment which are utilized.

Proper implements, tools and facilities shall be provided and used by the Contractor for the safe and convenient performance of the work. All pipe, fittings and valves shall be lowered into the trench with a suitable device that will not damage protective coatings and lining. Under no circumstances shall water main material be dropped or dumped into the trench. Any damaged lining, coating or wrapping shall be satisfactorily repaired or replaced.

Every precaution shall be taken to prevent foreign matter from entering the pipe while it is being placed in the line. If the pipe laying crew cannot put the pipe into the trench and in place without getting earth into it, the Engineer may require that before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size be placed over each end and left there until the connection is to be made to the adjacent pipe. If necessary, the line shall be swabbed or flushed out to remove all foreign matter prior to testing.

Before joining lengths of push-on pipe, the inside of the bell and the outside of the spigot shall be thoroughly cleaned to remove oil, grit, excess coating and other foreign matter.

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Pipe shall be laid with bell ends being in the direction of laying unless otherwise directed by the Engineer. When pipe is laid on a grade of 10 percent or greater, laying shall start at the bottom and shall proceed upward with the bell ends of the pipe upgrade.

The cutting of pipe for inserting valves, fittings or closure pieces shall be done in a neat manner without damage to the pipe or cement lining and so as to leave a smooth end at right angles to the axis of the pipe.

The deflection at pipe joints to accommodate changes in horizontal or vertical alignment shall be in accordance with the recommendations of the manufacturer. Where bends are called for on the plans, a standard bend may be used with any additional deflection required accomplished by deflecting joints on adjacent pipes.

Bends shall be used only at the locations shown on the plans or at other locations approved by the Engineer.

Underground valves shall rest on concrete masonry units. Valve boxes shall not transmit shock or stress to the valve and shall be centered and plumb over the wrench nut of the valve. The valve box cover shall be flush with the surface of the finished pavement or such other level as may be directed.

Valves set with a depth to operating nut greater than 6 feet shall be equipped with extension stems providing an operating nut depth of 4.5 feet. Extension stems shall be installed such as to preclude accidental disconnection from the valve, shall stand plumb and shall be supported at the upper end with a centering device attached to the stem or valve box.

Water main installed with less than 4.5 feet of cover must be insulated unless approved otherwise by the Engineer. Insulated water main must have 2.5 feet of minimum cover.

Water main shall be installed with a minimum 2 feet of clearance from existing structures unless indicated otherwise on the plans or directed by the Engineer.

Care shall be taken not to excavate below the depths required to perform the Work. The Contractor shall furnish and employ such trench boxes, steel plates, shores, braces, sheeting, pumps, etc., as may be necessary for the protection of property, proper completion of the Work and the safety of the public and employees of the Contractor and the Town. All bracing, sheeting, etc., shall be removed when no longer required for the construction or safety of the Work.

All excavated materials not required or unsuitable for backfill, (i.e., clay, silt, sand, muck, gravel, hardpan, loose shale, loose stone in masses and boulders greater than 5" in diameter) shall be removed and properly disposed of by the Contractor. Unsuitable soils that exhibit obvious evidence of heavy contamination or have been identified as containing elevated concentrations of contamination should be removed and stockpiled for characterization and possible off-site disposal. If contaminated soils are stockpiled best management practices must be employed to

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reduce human and environmental exposure to the stockpiled materials. Granular fill shall be used to replace all unsuitable material.

The trench shall be excavated to the depth required and so as to provide a uniform and continuous bearing and support for the pipe on solid and undisturbed ground except that bell depressions shall be provided at each joint to permit the joint to be made properly. Further, it will not be permissible to disturb and otherwise damage the finished surface over a maximum length of eighteen (18) inches near the middle of each length of pipe by the withdrawal of pipe slings or other lifting tackle. Any part of the bottom of the trench excavated below the specified grade shall be corrected with approved material and thoroughly compacted as directed by the Engineer. The finished trench bottom shall be prepared accurately by means of hand tools.

The Contractor shall furnish, put in place and maintain such trench support systems (i.e. trench boxes, steel plates, steel sheeting, etc.) as may be necessary to support the sides of the excavation and to prevent any movement of earth other than that intended to be accomplished by the excavation. Trench support systems shall be designed to support earth pressures, hydrostatic pressures, equipment and construction loads, and other surcharge loads, to allow safe and expeditious construction with minimal movement or settlement of ground, to prevent damage to, or movement or settlement of, adjacent buildings, structures, or utilities. Such systems shall be installed as may be necessary for the protection of the Work and for the safety of personnel, and shall comply with the safety precautions as outlined in the Associated General Contractors of America, "Manual of Accident Prevention in Construction," the "Occupational Safety and Health Act" of 1970 (OSHA) of latest revision and OSHA Reference: U.S. Dept. Of Labor O.S.H.A. Safety and Health Standards (29 CFR 1926/1910) revised March 5, 1990, Subpart P-Excavations, Trenching & Shoring Selection of Protective Systems, 1926-652 Appendix F.

To insure proper conditions at all times during construction, the Contractor shall provide and maintain ample means and devices with which to intercept and/or remove promptly and dispose properly of all water entering excavations. 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 or damage to pavements, other surfaces or property. Prior to discharge, the Contractor shall be responsible for removing all particulate matter which may be deposited in a stream or storm drainage system. The Contractor shall submit his proposed methods or procedures to the Engineer for approval. The Contractor shall be responsible for complying with all Federal, State and Town regulations which may be associated with said discharges.

Bedding material installed in all trenches shall be backfilled by hand from the bottom of the trench to the centerline of the pipe in layers of three (3) inches, compacted by tamping to at least ninety-five percent (95%) of maximum dry density at optimum moisture content as determined in accordance with the requirements of Method D of ASTM Test Method D-1557 (latest revision). Bedding material shall be deposited in the trench for its full width on each side of the pipe, fittings and appurtenances simultaneously. Care shall be taken that the fill is made compact and tight under the rounded lower half of the pipe. Iron tools suitable for tamping

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material under and on sides of pipe shall be used, and sufficient space for this tamping shall be provided. In general, wooden sticks, shovel handles and similar make-shift devices will not be considered as suitable tamping tools for use on sides of pipe.

From the centerline of the pipe, fittings and appurtenances to a depth of one (1) foot above the top of the pipe, the trench shall be backfilled by hand or by approved mechanical methods. Compaction shall not be less than ninety five percent (95%) of maximum dry density as determined by ASTM Test Method D-1557 (latest revision). The Contractor shall use special care in placing this portion of the backfill so as to avoid damaging or moving the pipe. This layer of backfill shall be consolidated by means of hand held vibratory compactors.

From one (1) foot above the pipe, the remainder of the backfill shall be placed and compacted in one (1) foot lifts. Each layer shall be compacted to not less than ninety five percent (95%) of maximum dry density as determined by ASTM Test Method D-1557 (latest revision).

Compaction methods shall be submitted in writing to and approved by the Engineer prior to commencement of any work.

There is no guarantee that all excavation can be done by use of machinery. In some cases, the pipe location may preclude the use of machinery. In this event, the Contractor will be required to perform this Work at the same unit price bid in his proposal.

Thrust Restraint

Poured concrete thrust blocks shall be provided at all horizontal bends, mechanical joint caps and tees and all locations indicated on the plans. Joints at fittings where thrust blocks are poured shall be wrapped with polyethylene. All mechanical joints (i.e., valves and fittings) shall be restrained by means of ductile iron retainer glands except where rod type restraint is specifically called for on the plans or ordered by the Engineer. Push-on joint restrainers shall be used on all push-on pipe joints for a distance of 27 feet on each side of all retainer glands. No more than one pipe joint shall be allowed within that 27 feet of pipe. Concrete shall be mixed and placed in accordance with the pertinent section of these Specifications.

Restraint of push-on joints shall be accomplished by means of using FIELD LOK 350 gaskets or approved equal push-on joint restrainers. The push-on pipe joint restrainers shall be installed in accordance with the manufacturer's recommendations.

Mechanical joint restrainer glands shall be installed by first tightening the tee head bolts and then making the set screws finger-tight against the pipe. All set screws shall be torqued to manufacturer's recommendations, proceeding alternately on opposite sides of the pipe.

At mechanical joints to be restrained by rods, the proper number of tee head bolts for the particular pipe size shall be removed and replaced with tiebolts. Tiebolts with washers shall be used on bell flange slots. The mechanical joint gland shall be restrained by nuts on the threaded portion of the tiebolts. Joint restraint shall be accomplished by placing threaded rods through corresponding tiebolts at glands on each end of the length to be restrained and by running nuts on

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the rods until tension is obtained. Four-inch, six-inch and eight-inch joints shall be restrained by two rods; 10-inch, 12-inch and 16-inch joints shall be restrained by four rods.

The Contractor shall be responsible for providing any temporary thrust restraint which may be required.

Connections to Existing Mains

Where connections are to be made between new water mains and existing water mains, any unspecified materials required shall be utilized only after inspection and approval by the Engineer. All connections between new mains and existing mains shall be made only at such times as, and in a manner, approved by the Engineer. The approximate locations of connections between new mains and existing mains are shown on the drawings; the exact locations will be determined in the field by the Engineer.

The cutting of an existing water main where connection is to be made to a new water main shall be done in a neat manner so as to leave a smooth end at right angles to the axis of the pipe. The open end of the section of existing water main to be abandoned shall be sealed with concrete before backfilling a minimum of 5' from the new facilities.

Abandonment of Existing Facilities

Abandonment of water facilities shall be as described on the plans. All open ends of abandoned pipelines or conduits which are created or exposed by the Contractor and will not be removed from the roadway, shall be sealed with concrete before backfilling. Valves to be abandoned shall be closed (unless otherwise indicated on the Plans) and the valve box tops shall be removed and properly disposed of. Where the plans call for salvaging existing water main and appurtenances, materials shall be delivered to the Water Department at the former Line Street Water Treatment Plant.

Leakage Testing

Leakage testing shall be performed on all cleaned and lined water mains as well as new installations where it is not possible to perform a pressure test. Leakage testing shall consist of a visual inspection of all new facilities and connections under system pressure. The Contractor shall furnish any temporary thrust restraint required for testing and any other apparatus and personnel necessary to conduct the test at no cost to the Town. All visual leaks shall be repaired by the Contractor at his own expense regardless of the amount of leakage. Any defective pipe, fitting, valve or hydrant discovered as a consequence of this test shall become the property of the Contractor and shall be removed from the job site and replaced at the Contractor's expense with sound material. When hydrants are in the test section, the test shall be made against the closed hydrant valve with the auxiliary gate valve open.

Any section failing the test shall be retested after the repairs have been made. The test shall be repeated until satisfactory to the Engineer. The main shall be disinfected again if so directed by the Engineer.

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Any required coordination between the Contractor and the Manchester Water Department shall be coordinated through the Engineer and shall be the responsibility of the Contractor.

Disinfection

Disinfection shall be carried out in accordance with Method 2 under Methods of Disinfecting Pipe in the Connecticut State Department of Health's Bulletin, "Protection and Disinfection of Water Works Pipes and Structures", as required by Section 19-13-B47 of the Connecticut State Sanitary Code.

Coordination with the Manchester Water Department through the Engineer will be necessary and shall be the responsibility of the Contractor.

Water mains less than 24-inches in diameter and up to 2,500 feet in length may be disinfected using the Tablet Method instead of the Continuous Feed Method. Disinfection using the Tablet Method shall be performed in accordance with the most current version of AWWA Standard C651. Chemicals used in the Tablet Method shall meet the requirements of AWWA B300 of latest revision and shall be certified to ANSI/NSF Standard 60. The Tablet Method shall not be used if trench water or foreign material has entered the main.

When disinfecting using the Continuous Feed Method, mains shall be completely flushed after the leakage test until all evidence of sediment is removed. A sodium hypochlorite solution or a mixture of calcium hypochlorite and water shall be applied, with a proper regulating device at the beginning of the pipe section to be disinfected, through a corporation stop in the newly lined pipe. Hypochlorites utilized in this work shall meet the requirements of AWWA B300 of latest revision.

Water from the existing distribution system entering the newly lined pipe shall be controlled to flow slowly during the application of hypochlorite. The rate of sodium hypochlorite application shall be in such proportion to the rate of water flowing through the pipe that the treated water entering the newly lined pipe will have a concentration of chlorine residual of 50 parts per million. There shall be a retention period of at least twenty-four (24) hours and preferably more. The non-spore forming organisms shall be destroyed, and the chlorine residual after the retention period at the extremity of the pipe shall be at least ten parts per million. When disinfecting newly lined and/or installed water pipe involving more than one valved section, all valves shall be operated while the pipeline is filled with the disinfecting agent. Hydrants and other appurtenances shall also be operated for disinfection.

Final Flushing and Testing

After disinfecting for the minimum retention period, the pipe section shall be flushed until, upon test, the quality of the water, both chemically and bacteriologically, is equal to the quality of the water served to the public from the existing water supply. The procedure shall be repeated if necessary until the water from the pipe section is satisfactory.

Care must be exercised when disposing of water with high free chlorine residuals and shall be performed in a manner that will not adversely impact the environment. Disposal of highly

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chlorinated water to storm sewers shall be avoided without neutralization of the chlorine residual. Neutralization of the chlorine residual remaining in the water can be accomplished by application of a neutralization chemical. Chlorine neutralization methods and equipment shall be submitted to the Engineer for approval. Discharge of highly chlorinated water directly to the sanitary sewer may be permitted in cases where surface discharge will pose a safety risk to the general public.

Tests to determine the chlorine residual and the quality of the water in the new pipeline will be performed by the Manchester Water Department. It shall be the responsibility of the Contractor to coordinate with the Water Department to arrange for the testing at the proper time. No less than twenty-four (24) hour notice shall be given when tests are to be performed.

Where connections are to be made between new water mains and existing water mains after disinfection and flushing are completed, new materials shall be swabbed with a suitable hypochlorite solution.

Pressure Testing

Newly installed water mains shall be pressure tested as directed by the Engineer. Pressure testing and leakage testing shall be carried out in accordance with the appropriate paragraphs of Section 4 of the latest revision of ANSI/AWWA C600 with the following clarifications and qualifications.

All testing shall be performed after backfilling the completed pipeline. Before testing, the Contractor shall submit in writing to the Engineer, his proposed method of testing the completed pipeline. Testing shall begin only after approval by the Engineer of the proposed methods. Any required coordination with the Water Department shall be conducted through the Engineer and shall be the responsibility of the Contractor.

All new sections of water main shall be hydrostatically tested at a pressure of 150 pounds per square inch for a period of at least two hours. "Pressurization" and "air removal" shall be accomplished as specified in Sections 4.1.2 and 4.1.3 of the latest revision of ANSI/AWWA C600. After the test pressure is applied, any defective pipe, fitting, valve or hydrant discovered as a consequence of this pressure test shall become the property of the Contractor and shall be removed from the job site and replaced at the Contractor's expense with sound material. The test shall be repeated until satisfactory to the Engineer.

A leakage test shall be conducted concurrently with the pressure test. The Contractor shall furnish all material, equipment, tools, labor and incidentals necessary to conduct the test.

Leakage will be defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof, to maintain pressure within 5 psi of the specified test pressure after the air in the pipeline has been expelled and the pipe has been filled with water. No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

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$$L = \frac{SD(P)^{1/2}}{133,200}$$

- L= Allowable leakage in gallons per hour
S= Length of the pipe tested, in feet
D= The nominal diameter of the pipe in inches
P= The average test pressure during the leakage test in pounds per square inch, gage (use 150 pounds per square inch)

When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gallons per hour per inch of nominal valve size will be allowed.

When hydrants are in the test section, the test shall be made against the closed hydrant valve (with the auxiliary gate valve open).

If any test of pipe laid discloses leakage greater than that specified above, the Contractor shall, at his own expense, locate and repair the defective materials until the leakage is within the specified allowance. All visible leaks shall be repaired regardless of the amount of leakage.

Any temporary thrust restraint required for testing sections of completed water main installation and later removed as directed by the Engineer shall be provided by the Contractor at no additional cost to the Town.

MEASUREMENT

“Water Main” of the size and type specified will be measured by the linear foot of pipe installed complete in place and accepted. Measurement will be along the centerline of pipe and fittings. Water main used to replace hydrant tees will not be measured for separate payment.

Ductile iron bends, tees, offsets, plugs and other such fittings of the size and type specified will be measured by the unit of the particular type and size complete and accepted.

Gate valves of the size and type specified will be measured by the unit of the particular size complete in place and accepted, including connecting sleeves, valve box and extension stem, if required.

Butterfly valves of the size and type specified will be measured by the unit of the particular size complete in place and accepted, including connecting sleeves, valve box and extension stem, if required.

Tapping sleeves and valves of the size and type specified will be measured by the unit of the particular size complete in place and accepted, as described in the pertinent section of these Specifications.

Cutting and capping of existing water mains that are to remain in service shall be measured by the unit and shall be the actual number of water mains excavated, cut, capped, backfilled and

WATER MAIN

accepted.

Concrete thrust blocks will be measured by the actual cubic yards of concrete placed in accordance with the plans and these Specifications. Thrust blocks to be measured for payment include only those placed at bends, tees and capped/plugged ends of live mains. Thrust blocks for temporary joint restraint, fire hydrants and abandonment of existing mains will not be measured separately for payment; the cost shall be considered as included in the contract unit price bid for "Water Main" of the size and type specified.

Permanent and temporary pavement repair will be measured for payment as described in the pertinent section of these Specifications.

Retainer glands, push-on joint restrainers and rod-type joint restraint will not be measured separately for payment; the cost shall be considered as included in the contract unit price bid for "Water Main" of the size and type specified..

Sleeves for connecting new water main to existing water main will not be measured separately for payment; the cost shall be considered as included in the contract unit price bid for "Water Main" of the size and type specified.

Disinfection, flushing and testing of water mains and appurtenances and providing temporary thrust restraint associated with testing will not be measured separately for payment; the cost shall be considered as included in the contract unit price bid for "Water Main" of the size and type specified.

Abandonment of valves will not be measured separately for payment; the cost shall be considered as included in the contract unit price bid for "Water Main" of the size and type specified.

Abandonment of blow-offs will not be measured separately for payment; the cost shall be considered as included in the contract unit price bid for "Water Main" of the size and type specified.

Removal from the job site, salvage and disposal of existing materials, as indicated on the plans or as directed by the Engineer, will not be measured for payment; the cost shall be considered as included in the contract unit price bid for "Water Main" of the size and type specified.

Open ends of abandoned pipelines or conduits that will not be removed from the roadway, shall be sealed with concrete before backfilling and will not be measured for payment; the cost shall be considered as included in the contract unit price bid for "Water Main" of the size and type specified.

Cutting and capping of existing water mains to remain in service will be paid for at the contract unit price each for "Cut and Cap Water Main", which price shall include excavation, cutting existing pipe, cap, backfill, including all materials, equipment, tools, labor, and incidentals

WATER MAIN

necessary to complete the Work.

Trench excavation, backfill, filter fabric, bedding material and trench support systems will not be measured separately for payment; the cost shall be considered as included in the contract unit price bid for "Water Main" of the size and type specified.

Granular fill for replacement of unsuitable material within the trench excavation will be measured for payment as described in the pertinent section of these Specifications.

Rock in trench excavation will be measured as described in the "Excavation" section of these Technical Specifications.

Removal of existing mains, valves and valve boxes, and salvage and disposal of existing materials as indicated on the plans, within the limits of trench excavation or where directed by the Engineer will not be measured for payment; the cost shall be considered as included in the contract unit price bid for "Water Main" of the size and type specified.

Pavement markings installed to replace disturbed markings will not be measured separately for payment; the cost shall be considered as included in the contract unit price bid for "Water Main" of the size and type specified.

PAYMENT

Furnishing and installation of water main will be paid for at the contract unit price per linear foot for "Water Main" of the size and type specified complete in place and accepted, which price shall include trench excavation, backfill, filter fabric, bedding material, pipe, retainer glands, push-on joint restrainers, rod restraint, solid sleeves, temporary restraint, disinfection, flushing and testing, and all materials, equipment, tools, labor and work incidental thereto.

Ductile iron bends, tees, offsets, and other such fittings will be paid for at the contract unit price each for the type and size of fitting complete in place, shall include trench excavation, backfill, filter fabric, bedding material, pipe, retainer glands, push-on joint restrainers, rod restraint, solid sleeves, temporary restraint, testing and disinfection, and all materials, equipment, tools, labor and work incidental thereto.

Gate valves, including connecting sleeves, extension stems and valve boxes, will be paid for at the contract unit price each for "Gate Valve" of the particular size complete in place, shall include trench excavation, backfill, filter fabric, bedding material, pipe, retainer glands, push-on joint restrainers, rod restraint, solid sleeves, temporary restraint, disinfection, flushing and testing, and all materials, equipment, tools, labor and work incidental thereto.

Butterfly valves, including connecting sleeves, extension stems and valve boxes, will be paid for at the contract unit price each for "Butterfly Valve" of the particular size complete in place, shall include trench excavation, backfill, filter fabric, bedding material, pipe, retainer glands, push-on joint restrainers, rod restraint, solid sleeves, temporary restraint, disinfection, flushing and testing, and all materials, equipment, tools, labor and work incidental thereto.

WATER MAIN

Tapping sleeves and valves will be paid for at the contract unit price each for "Tapping Sleeve and Valve " of the particular size complete in place, and shall include trench excavation, backfill, filter fabric, bedding material, temporary restraint, disinfection, flushing and testing, and all materials, equipment, tools, labor and work incidental thereto.

Cutting and capping of existing water mains to remain in service will be paid for at the contract unit price each for "Cut and Cap Water Main", which price shall include excavation, cutting existing pipe, cap, backfill, including all materials, equipment, tools, labor, and incidentals necessary to complete the Work.

Blow offs, including connecting sleeves, valve boxes, and MJ caps will be paid for at the contract unit price each for "Blow Off Assembly" of the particular size complete in place, which price shall include trench excavation, backfill, bedding material, pipe, retainer glands, rod restraint, solid sleeves, and all materials, equipment, tools, labor and work incidental thereto.

Granular fill for replacement of unsuitable material within the trench excavation will be paid for as described in the pertinent section of these Specifications.

Concrete for thrust blocks will be paid for as described in the pertinent section of these Specifications.

Permanent and temporary pavement repair will be paid for as described in the pertinent section of these Specifications.

Retainer glands, push-on joint restrainers and rod type joint restraint will be considered as included in the contract unit price bid for "Water Main" of the size and type specified.

Connecting sleeves will be considered as included in the contract unit price bid for "Water Main" of the size and type specified.

Abandonment of valves will be considered as included in the contract unit price bid for "Water Main" of the size and type specified.

Disinfection, flushing and testing of water mains and providing thrust restraint associated with testing will be considered as included in the contract unit price bid for "Water Main" of the size and type specified.

Removal from the job site, salvage and disposal of existing materials will be considered as included in the contract unit price bid for "Water Main" of the size and type specified.

Trench excavation, backfill, filter fabric, bedding material and trench support systems, will be considered as included in the contract unit price bid for "Water Main" of the size and type specified.

WATER MAIN

Rock in trench excavation will be paid for as described in the “Excavation” section of these Technical Specifications.

Removal of existing mains, valves and valve boxes, and salvage and disposal of existing materials as indicated on the plans, within the limits of trench excavation or where directed by the Engineer will be considered as included in the contract unit price bid for “Water Main” of the size and type specified.

Open ends of abandoned pipelines or conduits that will not be removed from the roadway, shall be sealed with concrete before backfilling and will be considered as included in the contract unit price bid for “Water Main” of the size and type specified.

Abandonment of blow offs will be considered as included in the contract unit price bid for “Water Main” of the size and type specified.

Pavement markings installed to replace disturbed markings will be considered as included in the contract unit price bid for “Water Main” of the size and type specified.

<u>Pay Item</u>	<u>Pay Unit</u>
4” Ductile Iron Pipe	Linear Foot
8” Ductile Iron Pipe	Linear Foot
10” Ductile Iron Pipe	Linear Foot
12” Ductile Iron Pipe	Linear Foot
12” x 8” Ductile Iron Tee	Each
12” x 4” Ductile Iron Tee	Each
8” x 8” Ductile Iron Tee	Each
8” x 4” Ductile Iron Tee	Each
8” – 1/8 Ductile Iron Bend	Each
8” – 1/16 Ductile Iron Bend	Each
6” – 1/8 Ductile Iron Bend	Each
4” – 1/16 Ductile Iron Bend	Each
8” x 6” Ductile Iron Reducer	Each
12” Gate Valve	Each
8” Gate Valve	Each
4” Gate Valve	Each

HYDRANT ASSEMBLY

DESCRIPTION

“Hydrant Assembly – New Main” of the type required includes the furnishing and installation of new fire hydrant assemblies on a new water main where shown on the plans or directed by the Engineer. It shall include, but not be limited to, trench excavation and backfill, furnishing and installation of the hydrant lead complete with hydrant tee, thrust block, pipe, fittings, auxiliary gate valve, mechanical joint restrainer glands, push-on joint restrainers, furnishing and installation of the hydrant with concrete masonry units, drainage stone and painting after installation.

“Hydrant Assembly – Existing Main” of the type required includes the furnishing and installation of new fire hydrant assemblies on an existing water main where shown on the plans or directed by the Engineer. It shall include, but not be limited to, trench excavation and backfill, cutting, removal and disposal of existing water main, furnishing and installation of the hydrant lead complete with hydrant tee, thrust block, pipe, fittings, auxiliary gate valve, mechanical joint restrainer glands, push-on joint restrainers, furnishing and installation of the hydrant with concrete masonry units, drainage stone and painting after installation.

“Hydrant Assembly with Tapping Sleeve and Valve” of the size and type required includes the furnishing and installation of new fire hydrant assemblies on an existing water main by means of installing a tapping sleeve and valve where shown on the plans or as directed by the Engineer. It shall include, but not be limited to, trench excavation and backfill, furnishing and installation of the hydrant lead complete with tapping sleeve and auxiliary gate valve, thrust block, pipe, fittings, mechanical joint restrainer glands, push-on joint restrainers, furnishing and installation of the hydrant with concrete masonry units, drainage stone and painting after installation.

“Remove Hydrant Assembly” includes the partial removal of existing hydrant assemblies where shown on the plans or as directed by the Engineer. It shall include, but not be limited to, trench excavation and backfill, removing and salvaging the existing hydrant; removing the existing hydrant tee from the main and replacing with new cement-lined ductile iron pipe connected via solid sleeves; removing the valve box from the road and sealing the open ends of the abandoned hydrant lead with concrete.

“Replace Hydrant Assembly” of the type required includes the furnishing and installation of new fire hydrant assemblies to replace existing where shown on the plans or as directed by the Engineer. It shall include, but not be limited to, trench excavation and backfill, removing the existing hydrant assembly and salvaging the existing hydrant, furnishing and installation of the hydrant lead complete with hydrant tee, thrust block, pipe, fittings, auxiliary gate valve, mechanical joint restrainer glands, push-on joint restrainers, furnishing and installation of the hydrant with concrete masonry units, drainage stone and painting after installation.

“Replace Hydrant” of the type required includes the furnishing and installation of new fire hydrants to replace existing where shown on the plans or as directed by the Engineer. It shall include, but not be limited to, trench excavation and backfill, removing and salvaging the existing hydrant, furnishing and installation of the hydrant lead from the existing auxiliary valve to the new hydrant complete with pipe, fittings, mechanical joint restrainer glands, push-on joint

HYDRANT ASSEMBLY

restrainers, furnishing and installation of the hydrant with concrete masonry units, drainage stone and painting after installation.

“Relocate Hydrant” includes moving an existing fire hydrant in close proximity to the original location where shown on the plans or directed by the Engineer. It shall include, but not be limited to, trench excavation and backfill, removal and disposal of existing hydrant lead and auxiliary valve, removal, storage, protection and reinstallation of the existing fire hydrant, furnishing and installation of the hydrant lead from the existing hydrant tee to the relocated hydrant complete with pipe, fittings, auxiliary gate valve, mechanical joint restrainer glands, push-on joint restrainers, and reinstallation of the existing hydrant with concrete masonry units, drainage stone and painting after installation.

MATERIALS

Hydrants: Hydrants shall be dry-barrel, post-type hydrants, with compression shut-offs which open with the pressure. Hydrants shall meet the requirements of AWWA C502. They shall have a main valve opening of 5-1/4 inches and have a 6-inch mechanical joint inlet. Bury length shall be 5-1/2 feet. Two 2-1/2 inch hose and one 4-1/2 inch pumper nozzles shall be provided in standard nozzle arrangement. Outlet nozzle threads shall meet the requirements of ANSI B26, "National Standard Fire-Hose Coupling Screw Threads." Hydrants shall be of break flange construction, shall have O-ring seals and **shall be right opening (clockwise) or left opening (counter clockwise) as indicated on the plans or as directed by the Engineer, which is dependent on where they are located in Town.**

Interior and exterior coatings shall meet the requirements of the latest revision of AWWA C502, and the color for that portion of the hydrant above the ground line shall be as directed by the Manchester Water Department.

In addition, that portion of each hydrant below finished grade shall be given a coating of hot bitumastic material, equal to that used for exterior coating of pipe and fittings, prior to installation. A drain outlet is required. Hydrants shall be Eddy Model F-2640 manufactured by Clow Corporation, Bensenville, Illinois, the Pacer Model WB-67 with 16” traffic section manufactured by Waterous, South St. Paul, Minnesota, the Metropolitan 250-Model 94 manufactured by U.S.Pipe and Foundry Co., Birmingham, AL., or Super Centurion 250 by Mueller Co., Decatur, IL. Hydrants shall be installed so as to maintain an 18-inch nozzle height above finished grade without use of extension sections.

The type of hydrant to be installed shall be determined in the field by the Engineer.

HYDRANT ASSEMBLY

- Ductile Iron Pipe: Ductile iron push-on joint pipe shall meet the requirements specified in the pertinent section of these Technical Specifications.
- Fittings: Mechanical joint fittings, exterior and interior coatings, and valve boxes shall meet the requirements specified in the pertinent section of these Technical Specifications.
- Hydrant Tee: Mechanical joint hydrant tees (a.k.a. anchor tees or swivel tees) shall be used to connect the hydrant lead to the water main.
- Auxiliary Gate Valves: All auxiliary gate valves shall be resilient wedge gate valves and shall meet the requirements specified in the pertinent section of these Technical Specifications. **Auxiliary gate valves shall be right opening (clockwise) or left opening (counterclockwise) as indicated on the plans or as directed by the Engineer, which is dependent on where they are located in Town.**
- Tapping Sleeves and Valves: All tapping sleeve and valve configurations and installations shall meet the requirements specified in the pertinent section of these Technical Specifications.
- Hydrant Paint: Paint for hydrants shall be high performance industrial coating alkyd enamel. Paint shall have a high gloss finish. Paint colors shall be Fire Hydrant Red (245385) for left-opening (counter clockwise) hydrants or Yellow (245488) for right-opening (clockwise) hydrants as manufactured by Rust-Oleum Corporation or approved equal. Surface preparation and paint application after hydrant installation shall be in accordance with the manufacturer's recommendations.
- Concrete: Concrete shall meet the requirements of Section M.03.01 of Form 817 for Class "A." Precast concrete masonry units shall meet the requirements of ASTM C139.
- Bedding Material: Three-quarter inch crushed stone shall meet the gradation requirements specified for stone and gravel in Section M.01.01 of Form 817.
- Joint Restraint: Mechanical joint restrainer glands and push-on joint restrainers shall meet the requirements specified in the pertinent section of these Technical Specifications.
- Connecting Sleeves: Sleeves for connecting new water mains to existing water mains shall be as described in the pertinent section of these Technical Specifications.

HYDRANT ASSEMBLY

CONSTRUCTION DETAILS

Trench excavation and backfill, installation of water main and appurtenances, testing, disinfection, pavement repair and surface restoration will be carried out as defined in the pertinent sections of these Technical Specifications.

Fire hydrants shall be provided and located as shown on the plans or as directed by the Engineer. Installation shall be as detailed on the plans and as defined in these Technical Specifications.

Hydrants shall stand plumb with the center a minimum of 2'-6" from the face of curb or edge of road. Hydrant nozzles shall be parallel with, or at right angles to the road, with the pumper nozzle facing the road. Hydrants shall be set to the established grade with a 5-1/2 foot bury and with nozzles 18 inches above the ground or as directed by the Engineer without the use of extension sections. It is the Contractor's responsibility to ensure final nozzle height is based on the finished grades shown on the plans and shall request clarification from the Engineer if proposed grades are unclear.

A mechanical joint offset or two 1/8 bends shall be utilized in the hydrant lead to achieve the proper grade of the fire hydrant when the depth of the water main does not permit these requirements to be met using only straight pipe. Offset or bends shall be located as close to the auxiliary gate valve as field conditions permit.

Auxiliary gate valves shall be set in accordance with the requirements of the pertinent section of these Technical Specifications. Depth of bury shall be as shown on the plans.

Tapping sleeve and auxiliary gate valves shall be installed in accordance with requirements of the pertinent section of these Technical Specifications.

All mechanical joints in hydrant leads shall have ductile iron restrainer glands.

All push-on joints in hydrant leads shall have push-on joint restrainers.

A poured concrete thrust block shall be provided behind the hydrant. The thrust block shall rest against undisturbed earth and shall not obstruct the hydrant drain.

A concrete collar shall be poured around the hydrant barrel as indicated on the plans. The Contractor shall place and secure a burlap bag or plastic bag over each new hydrant indicating the hydrant is "out-of service" and shall be responsible for maintaining this identification until the hydrant is put into service, at which time the cover shall be removed and disposed of.

All existing hydrants that are removed or replaced shall be salvaged. The hydrants shall be delivered to the Water Department facilities on Line Street, Manchester. The Contractor shall be responsible for properly unloading all salvaged materials.

HYDRANT ASSEMBLY

Where the plans call for existing hydrants to be removed (but not replaced), the existing hydrant shall be salvaged and the existing hydrant tee shall be removed from the main and replaced with new cement-lined ductile iron pipe connected to the existing main using solid sleeves. The valve box shall be removed from the road and the open ends of the abandoned hydrant lead shall be sealed with concrete.

Where the plans call for existing hydrants to be replaced, the existing hydrant shall be salvaged and the existing hydrant tee shall be removed from the main. The existing hydrant assembly shall be replaced with a new hydrant assembly in accordance with the provisions of this section.

Where excavations are to be made in grass covered areas, loam and topsoil shall be carefully removed and separately stored to be used again. If the Contractor prefers not to separate surface materials he shall furnish, as directed by the Engineer, loam and topsoil at least equal in quality to that excavated.

Hydrants shall be painted after installation entirely red or yellow based on the opening direction as specified herein.

MEASUREMENT

“Hydrant Assembly – New Main”, “Hydrant Assembly – Existing Main” and “Hydrant Assembly with Tapping Sleeve and Valve” will be measured as units, of the particular type, complete and accepted. Measurement shall be from and inclusive of the hydrant tee (or tapping sleeve) at the water main to back of the hydrant. Units measured under this item shall include the installation of new hydrant assemblies only.

“Remove Hydrant Assembly” will be measured as units, complete and accepted. Units shall be measured under this item only when a new hydrant assembly is not being installed at the location of the existing hydrant assembly. When an existing hydrant to be removed is located within the trench excavation limits of a new hydrant assembly, the removal of the existing hydrant assembly will not be measured for payment, but its costs shall be considered as included in the bid price for “Replace Hydrant Assembly”.

“Replace Hydrant Assembly” as indicated on the Plan will be measured as units, complete and accepted. This shall include both the removal of the existing hydrant assembly and the installation of a new hydrant assembly. Measurement shall be from and inclusive of the hydrant tee (or tapping sleeve) at the water main to the back of the hydrant.

“Replace Hydrant” as indicated on the Plan will be measured as units, complete and accepted. This shall include both the removal of the existing hydrant and the installation of a new hydrant. Measurement shall be from the existing auxiliary valve to the back of the hydrant.

“Relocate Hydrant” as indicated on the Plan will be measured as units, complete and accepted. This shall include removal of existing hydrant, storage, protection and reinstallation of the existing hydrant. Measurement shall be from the existing hydrant tee to the back of the hydrant.

HYDRANT ASSEMBLY

Excavation, backfill, storage, protection, salvage and delivery of existing hydrants, removal/disposal of existing materials (i.e. pipes, tees, valve boxes, hydrant leads etc.), abandonment of existing hydrant leads, thrust blocks, connecting sleeves, nipple pieces, restrainer glands, push-on pipe joint restrainers, rod type joint restraint, hydrant tees, bends, offsets, hydrant leads, auxiliary gate valves, concrete collars and other appurtenances will not be measured separately for payment but the cost shall be considered as included in the price bid for the Work.

Surface restoration will be measured for payment as described in the pertinent section of these Technical Specifications.

PAYMENT

“Hydrant Assembly – New Main” will be paid for at the contract unit price each for "Hydrant Assembly – New Main” installed on a new water main, of the particular type completed and accepted, which price shall include trench excavation, backfill, furnishing and installation of hydrant tee, thrust block, pipe, fittings, auxiliary gate valve and valve box, the hydrant lead including offset (Type B Hydrant Assembly), 1/8 bends (Type C Hydrant Assembly), mechanical joint restrainer glands, push-on pipe joint restrainers, hydrant, concrete masonry units, drainage stone, concrete collar, painting, as well as testing and disinfection, including all materials, equipment, tools, labor and incidentals necessary to complete the Work.

“Hydrant Assembly – Existing Main” will be paid for at the contract unit price each for "Hydrant Assembly – Existing Main” installed on an existing water main, of the particular type completed and accepted, which price shall include trench excavation, backfill, cutting, removal and disposal of existing water main, furnishing and installation of hydrant tee, thrust block, pipe, fittings, auxiliary gate valve and valve box, the hydrant lead including offset (Type B Hydrant Assembly), 1/8 bends (Type C Hydrant Assembly), mechanical joint restrainer glands, push-on pipe joint restrainers, hydrant, concrete masonry units, drainage stone, concrete collar, painting, as well as testing and disinfection, including all materials, equipment, tools, labor and incidentals necessary to complete the Work.

“Hydrant Assembly with Tapping Sleeve and Valve” will be paid for at the contract unit price each for "Hydrant Assembly with Tapping Sleeve and Valve” of the size and type required installed on an existing water main, completed and accepted, which price shall include trench excavation, backfill, furnishing and installation of tapping sleeve and auxiliary gate valve, thrust block, pipe, fittings, valve box, the hydrant lead including offset (Type B Hydrant Assembly), 1/8 bends (Type C Hydrant Assembly), mechanical joint restrainer glands, push-on pipe joint restrainers, hydrant, concrete masonry units, drainage stone, concrete collar, painting, as well as testing and disinfection, including all materials, equipment, tools, labor and incidentals necessary to complete the Work.

“Remove Hydrant Assembly” will be paid for at the contract unit price each for "Remove Hydrant Assembly" complete and accepted, which price shall include trench excavation, backfill, removal, salvage and delivery of existing hydrant, removal and disposal of existing materials (i.e. tees, valve boxes, hydrant leads, etc.), furnishing and installation of replacement pipe, solid sleeves, retainer glands, thrust restraint, testing and disinfection, including all materials, equipment, tools, labor and incidentals necessary to complete the Work. When an existing

HYDRANT ASSEMBLY

hydrant to be removed is located within the trench excavation limits of a new hydrant assembly, the removal of the existing hydrant assembly will not be paid for separately; the cost shall be considered as included in the bid price for “Replace Hydrant Assembly”.

“Replace Hydrant Assembly” will be paid for at the contract unit price each for “Replace Hydrant Assembly” complete and accepted, which price shall include trench excavation, backfill, removal, salvage and delivery of existing hydrant, removal and disposal of existing materials (i.e. tees, valve boxes, hydrant leads, etc.), furnishing and installation of new hydrant tee, thrust block, pipe, fittings, auxiliary gate valve and valve box, the hydrant lead including offset (Type B Hydrant Assembly), 1/8 bends (Type C Hydrant Assembly), mechanical joint restrainer glands, push-on pipe joint restrainers, hydrant, concrete masonry units, drainage stone, concrete collar, painting, as well as testing and disinfection, including all materials, equipment, tools, labor and incidentals necessary to complete the Work.

“Replace Hydrant” will be paid for at the contract unit price each for “Replace Hydrant” complete and accepted, which price shall include trench excavation, backfill, removal, salvage and delivery of existing hydrant, removal and disposal of existing hydrant lead and valve box, furnishing and installation of new pipe, fittings, valve box, the hydrant lead from the existing auxiliary valve to the new hydrant including offset (Type B Hydrant Assembly), 1/8 bends (Type C Hydrant Assembly), mechanical joint restrainer glands, push-on pipe joint restrainers, hydrant, concrete masonry units, drainage stone, concrete collar, painting, as well as testing and disinfection, including all materials, equipment, tools, labor and incidentals necessary to complete the Work.

“Relocate Hydrant” will be paid for at the contract unit price each for “Relocate Hydrant” complete and accepted, which price shall include trench excavation, backfill, removal, storage, protection and reinstallation of existing hydrant, removal and disposal of existing hydrant lead, auxiliary valve and valve box, furnishing and installation of new pipe, fittings, auxiliary gate valve and valve box, the hydrant lead from the existing hydrant tee to the relocated hydrant including offset (Type B Hydrant Assembly), 1/8 bends (Type C Hydrant Assembly), mechanical joint restrainer glands, push-on joint restrainers, and reinstallation of the existing hydrant with concrete masonry units, drainage stone, concrete collar, painting, as well as testing and disinfection, including all materials, equipment, tools, labor and incidentals necessary to complete the Work.

<u>Pay Item</u>	<u>Pay Unit</u>
Hydrant Assembly – New Main	Each
Remove Hydrant Assembly	Each
Replace Hydrant Assembly	Each
Relocate Hydrant	Each

REPLACE VALVE BOX

DESCRIPTION

“Replace Valve Box” includes the complete removal, furnishing and installation of entire gate boxes and curb boxes on the water distribution system where shown on the plans or directed by the Engineer.

“Replace Valve Box (Town Furnished)” includes the complete removal and installation of entire gate boxes and curb boxes or only the top section of gate boxes or curb boxes on the water distribution system that are found to be damaged prior to construction or as directed by the Engineer. The Town will furnish new boxes or top sections as necessary for installation by the Contractor.

“Reset Valve Box” includes the removal, furnishing and installation of only the top section or extensions stems for gate boxes and curb boxes on the water distribution system when existing top sections cannot be adjusted to match finished grade as determined by the Engineer.

Minor adjustments of existing gate boxes and curb boxes to match finished grade will not be measured separately for payment and shall be considered included in the general cost of the contract.

Installation of new water gate valves and associated boxes on the water distribution system will be measured and paid for under the appropriate item for valves elsewhere in these Specifications (where appropriate).

MATERIALS

Gate boxes shall be 5-1/4”, consisting of a base and adjustable slide type top section with cover. Gate boxes shall be made of centrifugally spun iron with ¼” uniform wall thickness. Box cover shall have the word "WATER" cast on top. Gate boxes shall be coated with heavy bituminous coating and be manufactured in North America by Water Quality Products, Bibby Ste. Croix, Charlotte, Tyler, Bingham and Taylor, or approved equal.

Curb boxes shall consist of a base and adjustable slide type top section with cover. Curb boxes shall be made of centrifugally spun iron with ¼” uniform wall thickness. Box cover shall have the word "WATER" cast on top. Curb boxes shall be coated with heavy bituminous coating and be manufactured in North America by Water Quality Products, Bibby Ste. Croix, Charlotte, Tyler, Bingham and Taylor, or approved equal.

Extension stems all other components related to this work shall be manufactured in North America by Water Quality Products, Bibby Ste. Croix, Charlotte, Tyler, Bingham and Taylor, or approved equal.

CONSTRUCTION DETAILS

When required, the existing gate box or curb box shall be completely removed and new box installed plumb such that the top of the box is flush with finished grade. The box shall be seated on a bedding of compacted granular fill to prevent lateral movement, rocking or settlement.

REPLACE VALVE BOX

If the Contractor damages an existing gate box or curb box during construction, the Contractor shall be responsible for all costs associated with replacing the entire box. The Contractor may be allowed to only replace the top section of the box if approved by the Engineer.

It is the Contractor's responsibility to identify any existing damaged gate boxes and curb boxes within the project limits and notify the Engineer prior to commencement of work. In these instances, the Town will furnish a new box, top section or extension stem as necessary for installation by the Contractor.

Rings for raising box covers to grade shall only be allowed with approval from the Engineer.

MEASUREMENT

"Replace Valve Box", "Replace Valve Box (Town Furnished)" and "Reset Valve Box" will be measured for payment by the actual number of these items completed and accepted in place.

PAYMENT

This work will be paid for at the contract unit price each for "Replace Valve Box", "Replace Valve Box (Town Furnished)" and "Reset Valve Box" complete in place and accepted, which price shall include removal, installing, resetting and adjusting entire gate boxes and curb boxes and/or components, and excavation, compacted granular fill, and all materials, equipment, tools, labor and incidentals necessary to complete the Work.

<u>Pay Item</u>	<u>Pay Unit</u>
Replace Valve Box	Each
Replace Valve Box (Town Furnished)	Each
Reset Valve Box	Each

AIR RELEASE VALVE MANHOLE

DESCRIPTION

“Air Release Valve Manhole” includes the furnishing and installation of all materials necessary for the construction of an air release valve and manhole as indicated on the plans or directed by the Engineer. It includes, but is not limited to: trench excavation and backfill and the furnishing and installing pipe, fittings, air release valve, precast concrete manhole and drainage stone.

MATERIALS

Precast manhole sections shall be similar or equal to that shown on the plans and shall conform to ASTM C-478 and C-443 (joint).

Precast concrete masonry units shall meet the requirements of ASTM C139.

Brick shall conform to ASTM Specifications C-32 for sewer brick, grade MS.

Standard mortar shall consist of one (1) part cement and two (2) parts clean sand. No lime shall be added to the mortar.

Manhole frames and covers located within paved areas shall be heavy duty and shall be Model 1027C as manufactured by Campbell Foundry Company, Model 2927E as manufactured by Laperle Foundry Company or Model/Product Numbers 00133872 and 00124811 as manufactured by East Jordan Ironworks.

Manhole frames and covers located within unpaved areas shall be heavy duty and water-tight (bolted and gasketed) with ½” stainless steel bolts and shall be Model 1502 as manufactured by Campbell Foundry Company, Model 6502 as manufactured by Laperle Foundry Company or Model/Product Numbers 00124872 and 0124872W03 as manufactured by East Jordan Ironworks.

The cover shall be cast with the words "MANCHESTER WATER". Cast iron shall conform to ASTM A-48 Class 30B or its latest revisions. Frames and covers shall be coated with a bitumastic coating.

Coating for exterior surfaces of all manholes shall be bituminous waterproofing material. The material shall be Minwax Fibrous Brush Coat made by Minwax Co., New York, New York; Tremco 121 Foundation Coating made by the Tremco Manufacturing Company, Cleveland, Ohio; Bitumastic Black Solution made by the Koppers Company, Inc., Pittsburgh, Pennsylvania; or approved equal product.

Air release valve shall have 1-inch inlet and 3/8-inch outlet with 1/16-inch orifice. Valve shall be Figure No. 910 as manufactured by Golden Anderson Industries of Mars, PA or approved equal.

The corporation stop shall have an iron pipe thread inlet, and the outlet shall be packed joint for copper tubing. The corporation stop shall be a one (1) inch No. FB1100 manufactured by the Ford Meter Box Company, Inc., Wabash, Indiana, No. B-25028 manufactured by Mueller Co.,

AIR RELEASE VALVE MANHOLE

Decatur, IL., No. 4704 BT or 4704 BQ manufactured by A.Y. McDonald Mfg. Co., Dubuque, IA., or No. J-1935 manufactured by James Jones Co., El Monte, CA..

Concrete shall meet the requirements of Section M.03.01 of Form 817 for Class "A."

Bedding material shall be three-quarter inch crushed stone shall meet the gradation requirements specified for stone and gravel in Section M.01.01 of Form 817.

CONSTRUCTION DETAILS

Trench excavation and backfill, installation of water main and appurtenances, testing, disinfection, pavement repair and surface restoration will be carried out as defined in the pertinent sections of these Specifications.

Air release valves manholes shall be provided and located as shown on the plans or as directed by the Engineer. Installation shall be as detailed on the plans and as defined in these Technical Specifications.

MEASUREMENT

“Air Release Valve Manhole” will be measured as a unit complete and accepted. Measurement shall include air release valve, corporation stop, manhole riser, frame and cover as well as all piping, bedding and concrete required to construct valve and manhole as depicted on the drawings.

Concrete will not be measured separately for payment but the cost shall be considered as included in the price bid for the work.

Excavation, backfill and excavation support systems will not be measured separately for payment but the cost shall be considered as included in the price bid for the work.

Surface restoration will be measured for payment as described in the pertinent section of these Technical Specifications.

PAYMENT

Air release valve manholes will be paid for at the contract unit price each for "Air Release Valve Manhole," completed and accepted, which price shall include trench excavation, backfill, air release valve, corporation stop, manhole, frame and cover, drainage stone, concrete, including all materials, equipment, tools, labor and incidentals necessary to complete the Work.

Concrete will not be paid for separately; the cost shall be considered as included in the price bid for the Work.

Excavation, backfill and excavation support systems will not be paid for separately; the cost shall be considered as included in the price bid for the Work.

AIR RELEASE VALVE MANHOLE

Surface restoration will be paid for as described in the pertinent section of these Technical Specifications.

Pay Item

Air Release Valve Manhole

Pay Unit

Each

WATER BYPASS PIPING

DESCRIPTION

“Water Bypass Piping” of the size specified shall consist of the furnishing of all equipment, labor, supervision, incidentals and material necessary for temporarily bypassing the water distribution system around the work area as required for construction. This Work includes maintaining continuous and reliable water service in all water distribution pipes including individual service connections during construction, and disinfection, flushing, testing and removal of the temporary system.

Construction that may require a temporary water bypass system includes, but is not limited to, cleaning and lining of existing water mains, replacement of existing water mains, connection of new water distribution mains to existing mains, booster pump station improvements, installation of valves, fittings and other appurtenances, and disinfection, flushing and testing of new water main. Water bypass piping shall only be used where approved by the Engineer.

Refer to the General Conditions elsewhere in these specifications for licensing requirements for any person involved in the installation of a water main and/or appurtenances.

MATERIALS

Water bypass piping materials and appurtenances shall not cause the water delivered to customers to become non-potable, produce aesthetic problems such as taste and odors, or promote bacterial growth after being placed into service. All bypass pipe materials and products (especially plastic), paints, linings, coatings, adhesives, lubricants, etc. in direct contact with potable water shall be NSF or UL certified to NSF/ANSI Standard 61 and shall meet these minimum standards:

1. The pipe materials shall conform to the same standards as permanent piping.
2. The provision of temporary bypass piping must be made in a reliable and sanitary manner such that impurities are not imparted to the water.
3. Piping, couplings, fittings and appurtenances shall be watertight and pressure rated for 200 psi minimum operating pressure.
4. The pipe and/or hose must be designated or certified for potable/residential water use and must meet the latest revision of NSF Standard 61 certification and or AWWA standards.
5. Disinfection of temporary bypass pipes and hoses must be performed in accordance with AWWA standards.
6. Flexible fire hose shall not be permitted.
7. The allowable pipe materials are as follows:
 - (a) Ductile iron pipe
 - (b) Steel pipe
 - (c) Plastic pipe:
 - Polyvinyl chloride (PVC) pressure pipe
 - Standard polyethylene (PE) pressure pipe and tubing, ½ inch (13 mm) through 3 inches (76 mm)

WATER BYPASS PIPING

- Standard polyethylene–aluminum–polyethylene & cross linked polyethylene–aluminum
- Molecularly oriented polyvinyl chloride (PVCO) pressure pipe, 4 inches through 12 inches
- Others as approved in writing by the Engineer

All provisions of ANSI/AWWA G200-09 Standard for Distribution Systems Operation and Management shall be followed during bypassing of the water distribution system.

CONSTRUCTION DETAILS

Temporary Bypass Piping

The Contractor shall submit to the Engineer a water distribution system bypass schedule required to complete the Work. At a minimum, the schedule will include the proposed sequencing and coordination of cleaning and lining of existing water mains, replacement of existing water mains, connection of new water distribution mains to existing mains, booster pump station improvements, installation of valves, fittings and other appurtenances, disinfection, flushing and testing of new water main and the handling of water flow during all aspects of construction. The Engineer shall approve such schedule prior to implementation.

The Contractor shall prepare a specific, detailed description of the proposed water distribution bypass system (Water Bypass Piping Plan). The Water Bypass Piping Plan shall be submitted at least two (2) weeks prior to its intended use and must be approved by the Engineer prior to the mobilization of any of the equipment included in the Water Bypass Piping Plan. The Water Bypass Piping Plan shall outline all provisions and precautions to be taken by the Contractor regarding handling of existing water flows.

This Water Bypass Piping Plan must be specific and complete, including such items as schedules, locations, materials, disinfection methods, and all other incidental items necessary and/or required to ensure proper protection of the facilities, including protection of bypass piping from damage.

The inclusion of this Specification and associated bid items in the Contract does not imply a bypass system will be allowed. The Contractor shall schedule work as required to install new water main, services and appurtenances without the need for a bypass system, unless such system is deemed necessary by the Engineer. No construction shall begin until the Water Bypass Piping Plan including all provisions and requirements have been reviewed and approved by the Engineer.

The Water Bypass Piping Plan shall include, but is not limited to, the following details:

1. Plan indicating location, size and type of proposed temporary water bypass piping including all temporary service piping, associated valves, fittings, hydrants, backflow prevention devices and other appurtenances.

WATER BYPASS PIPING

2. Proposed locations of connecting temporary bypass pipe to the active water distribution system.
3. Size and material of the water distribution main to be bypassed.
4. Proposed methods of disinfecting the temporary bypass system.
5. Method of protecting bypass piping from damage.
6. Any temporary pipe supports, anchoring requirements, thrust and restraint block sizes and locations.
7. Calculations for bypass piping sizing.
8. Schedule for installation of and maintenance of bypass piping.
9. Contractor's plan for providing continuous monitoring of the bypass operation as well as the monitoring person's qualifications.

The Contractor shall furnish, install, maintain and remove temporary service pipe of the size required, from which connections shall be made to all water customers. Temporary fire hydrants shall be provided when existing hydrants are out of service due to the work. Temporary service pipe shall not be installed without prior approval of the Engineer. Water distribution systems shall only be bypassed around construction activities when long periods of system shutdown are anticipated and when authorized by the Engineer.

The bypass piping size identified as a Contract bid item is approximate. Bypass piping shall be sized to provide a minimum fire flow of 750 gpm or as required by the Engineer to provide adequate service to customers.

The Contractor shall do all excavating for connections of temporary service pipes to existing live water mains and make all such connections. Whenever possible, two feeds shall be provided to the temporary piping system. The Contractor shall also furnish, install, maintain, connect, disconnect and remove individual service lines to all water customers.

The design, installation, disinfection, operation, repair and maintenance of all temporary bypass systems shall be the responsibility of the Contractor.

The Contractor shall provide a suitable backflow prevention device for all connections of temporary service pipes to existing live water mains. Backflow prevention devices to be used shall be as approved by the Engineer.

The work of providing suitable safety precautions during the temporary service period shall be the responsibility of the Contractor.

Before starting any work that will affect service to customers, the Contractor shall notify the Manchester Water Department in advance so that a minimum of two (2) full working days notice may be given to any user whose service will be interrupted for any reason.

Contractor shall construct, maintain and repair all temporary water bypass piping systems and shall be responsible for providing appropriate conditions for proper installation, disinfection,

WATER BYPASS PIPING

flushing and testing of water pipe during construction. Any required repairs to bypass systems shall be immediately completed to prevent any interruption in service within the water distribution system. The Contractor shall promptly repair and or replace any leaking or faulty temporary service pipe as ordered by the Engineer.

The Contractor shall be responsible for after-hours maintenance of the temporary facilities. He may do so in one of the following manners:

1. Hire an individual who will be available for contact by the Town after normal working hours. This individual must be provided with a pager and be available between the hours of 3:30 p.m. and 7:00 a.m., seven (7) days a week including holidays. His response time shall be one (1) hour or less. The individual shall have all licenses necessary to allow him to work on a public water supply system. The pager number shall be provided to the Town's on-call personnel.
2. Utilize Town of Manchester Water Department personnel for after-hours maintenance. The Town's on-call personnel will assign Department staff on a rotating basis utilizing the Town's overtime list. The contractor will be billed on a "per call" basis in accordance with the current union contracts and the "Schedule of Rates, Charges and Fees" for the Water Division. The Contractor shall be responsible for providing access by Town personnel to a supply of repair materials for the purpose of making after hours repairs. These materials will be supplied at no cost to the Town.

Care shall be exercised throughout to avoid any possible pollution of mains, house services, or temporary service pipe.

Generally, temporary service pipe shall be laid in gutters. At driveways, pipe crossings shall be provided by cold patch cover or other approved method. At street intersections, pipe shall be laid in a shallow trench covered with temporary surfacing. Sanitary precautions shall be satisfactory to the Engineer.

The interior of temporary service pipe shall be disinfected, flushed and tested as described in "Water Main" elsewhere in these Specifications.

All service pipe shall be suitably valved and meet the approval of the Engineer. A valve shall be provided at each tap hole connection. Valves shall be located no further than one (1) block apart when directed by the Engineer.

Whether it is being installed, in service, or being removed, the amount of temporary service pipe kept on the job shall be the minimum that will allow the Work to continue at a reasonable rate.

The Contractor shall be responsible for all consumer connections. The Water Department will enter upon all private property and assist the Contractor in making final service connections. The Contractor shall provide a minimum of twenty-four (24) hours notice to the Water Department so that a man may be available when required.

WATER BYPASS PIPING

Pipe Access Openings

The Contractor shall make openings in the pipeline as necessary to properly perform his Work. Openings in the pipe shall be made by cutting and removing pipe sections. All pipe shall be cut square and true. Except as otherwise approved, all cutting shall be done with a machine suitable for cutting cast iron pipe. Hydraulic squeeze cutters are not acceptable for cutting cast iron pipe. Travel type cutters or rotary type abrasive saws may be used. All cut ends shall be examined for possible cracks caused by cutting.

Any pipe sections removed, damaged and/or not cut square and true shall be replaced with a new pipe section. The section of pipe removed shall become the property of the Contractor.

At openings adjacent to sections under pressure or in service, the Contractor shall install adequate temporary joint restraint devices to prevent movement of closed valves.

At all times when the work is not actually in progress, the openings in the pipe shall be closed by temporary watertight plugs or other approved means. If water is in the trench when work is resumed, the plug shall not be removed until all danger of water entering the pipe has passed.

Closing Pipe Openings

The Contractor shall furnish all labor, materials, tools and equipment necessary to satisfactorily close and make watertight all pipe openings in the mains. Closures shall be made with new cement-lined ductile iron pipe of equivalent wall thickness and diameter as the pipe, which is to be replaced. All couplings and pipe required to close the pipe openings shall conform to the requirements of "Water Main" elsewhere in these Specifications.

Disinfection and Flushing

The Contractor shall disinfect all mains carrying potable water. Disinfection shall be performed as described "Water Main" elsewhere in these Specifications.

Backfilling Operations

As soon as practicable after pipe openings have been closed, backfilling shall be started. All backfilling shall be done in accordance with the requirements of "Water Main" elsewhere in these Specifications. Excavations shall not be backfilled at pipe openings until after those joints created in closing pipe openings have successfully passed leakage tests required.

The Contractor's attention is directed to the fact that he will be responsible for the replacement of pavement. Therefore, in backfilling excavations occurring where pavement is to be replaced, the Contractor will be held responsible for providing a temporary pavement repair in accordance with the requirements of "Pavement Repair" elsewhere in these Specifications.

MEASUREMENT

"Water Bypass Piping" of the size and type specified will be measured by the linear foot of pipe installed complete in place and accepted. Measurement will be along the centerline of pipe,

WATER BYPASS PIPING

including all fittings, valves, temporary hydrants and connections to water customers.

Access openings, disinfection, flushing and testing will not be measured separately for payment; the cost shall be considered as included in the contract unit price bid for "Water Bypass Piping" of the size and type specified.

PAYMENT

"Water Bypass Piping " of the size and type specified will be paid for at the contract unit price per linear foot of pipe furnished and installed, complete in place and accepted, which price shall include trench excavation, backfill, pipe cutting and repair, access openings, installation of temporary piping and temporary hydrants, fitting, valves and connections to all water customers as necessary, disinfection, flushing and testing, and all materials, equipment, tools, labor incidentals necessary to complete the Work.

<u>Pay Item</u>	<u>Pay Unit</u>
2" Water Bypass Piping	Linear Foot
4" Water Bypass Piping	Linear Foot

RESET MANHOLE TO GRADE

DESCRIPTION

“Reset Manhole to Grade (Existing Frame and Cover)” includes the resetting of an existing manhole frame and cover to grade. It also includes reconstructing the existing structure walls and modifying riser sections as required to accommodate proposed elevations.

“Reset Manhole to Grade (New Frame and Cover)” includes the removal of an existing manhole frame and cover and furnishing, installing and adjusting a new manhole frame and cover to grade. It also includes reconstructing the existing structure walls and modifying riser sections as required to accommodate proposed elevations. The Engineer will identify manholes requiring installation of new frame and covers in the field during construction.

MATERIALS

Materials used for reconstruction shall be those indicated on the Plans or as directed by the Engineer and shall conform to Section M.08.02 of Form 817.

Storm manhole covers shall be cast with the words "TOWN OF MANCHESTER DRAIN" or "MANCHESTER DRAIN".

Sanitary sewer manhole frames and covers shall be heavy duty and shall be Model 1027C as manufactured by Campbell Foundry Company, Model 2927E as manufactured by Laperle Foundry Company or Model/Product Numbers 00133872 and 00124811 as manufactured by East Jordan Ironworks.

Sanitary sewer manhole covers shall be cast with the words "MANCHESTER SEWER" and shall be coated with a bitumastic coating. Cast iron shall conform to ASTM A-48 Class 30B or its latest revisions.

Protective compound material shall conform to Section M.03.09 of Form 817.

Mortar shall conform to Section M.11.04 of Form 817.

Materials for damp-proofing shall conform to Section M.12.05 of Form 817.

CONSTRUCTION DETAILS

Frames and covers which are to be removed or reset shall be removed from their present beds, the walls or risers of the manhole shall be reconstructed in accordance with the requirements contained herein for the character of work involved to accommodate the new frame elevation. The limits of reconstruction of the structure walls and risers shall be 3' (measured vertically) unless determined otherwise by the Engineer.

All masonry units shall be laid in full mortar beds of at least ½" thickness.

Steel frames shall be set in full mortar beds or otherwise secured as shown on the plans.

RESET MANHOLE TO GRADE

All new manhole riser sections shall be precast concrete. Manholes shall be reconstructed with at least one precast concrete riser ring between the structure walls and the manhole frame to accommodate future adjustment. Concrete block or bricks may be used with the approval of the Engineer.

When directed by the engineer, frames and covers for new manholes located within limits of road reconstruction shall be temporarily set at the binder course elevation and raised to the final course elevation immediately prior to paving at no additional cost.

MEASUREMENT

“Reset Manhole to Grade (Existing Frame and Cover)” will be measured for payment by the actual number of manhole frame and covers adjusted and accepted.

“Reset Manhole to Grade (New Frame and Cover)” will be measured for payment by the actual number of manhole frame and covers furnished, installed and accepted.

PAYMENT

“Reset Manhole to Grade (Existing Frame and Cover)” will be paid for at the contract unit price for each structure adjusted, complete in place, which price shall constitute full compensation for all materials, equipment, tools and labor incidental thereto.

“Reset Manhole to Grade (New Frame and Cover)” will be paid for at the contract unit price for each frame and cover furnished, installed and adjusted, complete in place, which price shall constitute full compensation for all materials, equipment, tools and labor incidental thereto.

The following items will not be paid for separately, but the cost thereof shall be included in the contract unit prices for “Reset Manhole to Grade (Existing Frame and Cover)” and “Reset Manhole to Grade (New Frame and Cover)”:

1. Removal and disposal of existing frame and covers to be replaced (where directed)
2. Removal and disposal of upper portions of structures to be abandoned
3. Reconstruction or replacements of existing manhole riser sections (up to 3' in depth)
4. Damp-proofing
5. Sawcutting of pavement around existing manholes as required
6. Adjusting manhole frame and covers from binder course elevation to final grade

When the work requires reconstruction of existing structure side walls and risers greater than 3' (measured vertically), then the Engineer will determine if the additional reconstruction will be paid for as extra work or if the entire structure is to be replaced and paid for under the appropriate specification.

<u>Pay Item</u>	<u>Pay Unit</u>
Reset Manhole to Grade (Existing Frame and Cover)	Each
Reset Manhole to Grade (New Frame and Cover)	Each

EROSION AND SEDIMENTATION CONTROLS

DESCRIPTION

“Silt Fence” includes the furnishing, placing, maintaining and removal of manufactured geotextile silt fence where shown on the Plans or where directed by the Engineer.

“Hay Bales” includes the furnishing, placing, maintaining and removal of hay bales where shown on the Plans or where directed by the Engineer.

“Silt Sack” includes the furnishing, placing, maintaining and removal of manufactured geotextile silt sacks specifically made to protect catch basins where shown on the Plans or where directed by the Engineer.

“Construction Entrance” includes the furnishing and installation of a temporary crushed stone pad on a geotextile surface located so as to prevent dirt and mud from tracking onto existing pavement. The exact location(s) of “Construction Entrance” shall be determined by the Engineer.

“Turbidity Curtain” includes the furnishing, placing, maintaining and removal of manufactured geosynthetic material where shown on the Plans and as directed by the Engineer.

MATERIALS

Geotextile shall conform to Section M.08.01.19 of Form 817.

Silt Sack shall be Hi-Flow Siltsack® Type A (for Type “C-L” catch basin tops) and Type B with curb deflector (for Type “C” catch basin tops or other structure with curb inlets) as manufactured by ACF Environmental, Inc., Richmond, VA (800-448-3636) or approved equal. Silt sack shall be provided with internal overflows and meet the following criteria:

<u>Properties</u>	<u>Test Method</u>	<u>Units</u>
Grab Tensile Strength	ASTM D-4632	265 lbs
Gran Tensile Elongation	ASTM D-4632	20%
Puncture	ASTM D-4833	135 lbs
Mullen Burst	ASTM D-3786	420 psi
Trapezoid Tear	ASTM D-4533	45 lbs
UV Resistance	ASTM D-4355	90%
Apparent Opening Size	ASTM D-4751	#20 U.S. Sieve
Flow Rate	ASTM D-4491	200 gal/min/sq ft
Permittivity	ASTM D-4491	1.5/sec

Crushed stone for Construction Entrances shall conform to “Grading A” of Section M.02.06 of Form 817.

EROSION AND SEDIMENTATION CONTROLS

Turbidity curtain shall be manufactured by ACF Environmental, Richmond, VA (800-448-3636) or approved equal.

RESPONSIBILITY

It is the Contractor's sole responsibility to provide and continually inspect and maintain all erosion and sedimentation control measures on the site. Failure to do so may result in enforcement actions by the Town of Manchester or State of Connecticut. The erosion and sedimentation control measures shown on the Plans or in these Specifications are intended as a guideline to show the minimal control measures required based on the intended construction. Additional control measures may be necessary depending upon the Contractor's operations and scheduling of the project.

CONSTRUCTION DETAILS

Geotextile sedimentation control systems may consist of either a prefabricated geotextile fence or a geotextile fence assembled by the Contractor in the field. Geotextile sedimentation control systems shall be installed so that the bottom four (4) inches of the fabric is buried by either trenching or by laying the four (4) inch section horizontally on the ground and burying by ramping the soil up to the control fence. All geotextile fences shall be a least 36 inches in exposed height as installed, with not less than a two (2) degree and not more than a 20 degree inclination toward the potential silt source. Hardwood posts shall have a minimum cross-section size of at least 1.5 inches by 1.5 inches and a minimum length of 30 inches. Steel posts shall be at least 0.5 pound per linear foot with a minimum length of 48 inches. Spacing between posts shall not exceed ten (10) feet, and all posts shall be driven a minimum of 12 inches into the ground. When joints between sections of geotextile sedimentation control systems are necessary, geotextile shall be spliced together only at a support post, with a minimum six (6) inch overlap, and securely sealed.

The installations shall be maintained or replaced until they are no longer necessary for the purpose intended or are ordered removed by the Engineer. Cleanout of accumulated sediment shall be accomplished when one-half of the original height of the sedimentation control system, as installed, becomes filled with sediment or as ordered by the Engineer.

The geotextile fence systems will be completely removed from the project at the completion of the project, unless specifically authorized by the Engineer to be left in place.

Unless a specific type of sedimentation control system is indicated on the plans or directed by the Engineer, the type of system will be at the Contractor's option.

Silt sacks shall be installed in accordance with manufacturer's instructions and shall be emptied when they have collected 6" to 12" of sediment and when directed by the Engineer. Silt sacks shall be inspected every 1 to 2 weeks and after every major rainfall event.

Turbidity curtains shall be installed in accordance with manufacturer's instructions.

EROSION AND SEDIMENTATION CONTROLS

Erosion and sedimentation control measures shall be installed prior to any excavation, grubbing or other operation that disturbs existing ground.

MEASUREMENT

“Silt Fence” and “Hay Bales” will be measured for payment by the actual number of linear feet of “Silt Fence” or “Hay Bales” installed and accepted. Measurement shall be made along the center-line of the system. Replacement systems will not be measured for payment.

“Silt Sacks” will be measured for payment by the actual number of silt sacks installed and accepted. Different types of silt sacks installed for catch basin tops (with and without curb inlets) and replacement systems will not be measured separately for payment.

“Construction Entrances” will be measured for payment by the actual number of construction entrances installed and accepted. Replacement systems will not be measured for payment.

“Turbidity Curtains” will not be measured separately for payment, but shall be considered as included in the unit price bid for “Handling Water” when provided elsewhere in these Specifications.

Any other erosion and sedimentation control systems required as a result of the Contractor’s operation will not be measured for payment.

PAYMENT

“Silt Fence” and “Hay Bales” will be paid for at the contract unit price per linear foot for “Silt Fence” or “Hay Bales”, 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 cleanout of accumulated sediment.

“Silt Sack” will be paid for at the contract unit price each for “Silt Sack” 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. No separate payment shall be made for the cleanout of accumulated sediment or for different types of silt sacks installed for catch basin tops (with and without curb inlets) and replacement systems.

“Construction Entrance” will be paid for at the contract unit price each for “Construction Entrance” 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. No payment shall be made for the cleanout of accumulated sediment.

“Turbidity Curtains” will not be measured separately for payment, but shall be considered as included in the unit price bid for “Handling Water” when provided elsewhere in these Specifications.

EROSION AND SEDIMENTATION CONTROLS

Pay Item

Silt Fence

Silt Sack

Pay Unit

Linear Foot

Each

RESTORATION OF LAWN AND WETLAND AREAS AND EROSION CONTROL BLANKET

DESCRIPTION

“Restoration of Lawn Areas” includes all work required to establish turf, including the furnishing and installation of screened topsoil and of a specified slurry mixture of seed, fiber, fertilizer and stabilizer emulsion with hydro-mulch equipment, where shown on the Plans or where directed by the Engineer.

“Restoration of Wetland Areas” includes all work required to establish vegetation, including the furnishing and installation of screened topsoil, and of a specified slurry mixture of seed, fiber, fertilizer and stabilizer emulsion with hydro-mulch equipment, within the wetlands areas identified on the Plan or where directed by the Engineer.

“Erosion Control Blanket” includes the furnishing and installation of a manufactured straw/fiber blanket at the locations shown on the Plans or where directed by the Engineer.

MATERIALS

Fertilizer: Fertilizer shall conform to the requirements of Section M.13.03 of Form 818 or an approved equal. Soil testing and analysis may be performed by the Contractor at the Contractor’s expense to determine fertilizer rate. Submit Manufacturer’s product specifications and guaranteed purity analysis for fertilizer. Apply at a minimum rate of 25 lbs/ 1,000 SF or as per recommended by results of soil testing.

Mulch: Cellulose fiber mulch shall conform to the requirements of Section M.13.05.3 of Form 818. Apply at a minimum rate of 40 lbs/ 1,000 SF.

Tackifier: Organic tackifier shall be applied at rate of 70 lbs./acre

Topsoil: The term topsoil used herein shall mean a soil meeting the soil textural classes established by the United States Department of Agriculture Classification System based upon the proportion of sand, silt, and clay size particles after passing a two (2) millimeter (mm) sieve and subjected to a particle size analysis. The topsoil shall not contain less than 6% nor more than 20% organic matter as determined by loss-on-ignition of oven dried samples dried at 105 degrees centigrade.

The following textural classes shall be acceptable:

- Loamy sand, including coarse, loamy fine, and loamy very fine sand
- Sandy loam, including coarse, fine and very fine sandy loam
- Loam
- Silt loam, with not more than sixty (60) percent silt

The topsoil to be furnished by the Contractor shall be loose, friable, reasonably free of admixtures of subsoil, free from refuse, stumps, roots, brush, weeds, rocks, and stones ½ inch

**RESTORATION OF LAWN AND WETLAND AREAS
AND EROSION CONTROL BLANKET**

and over in all dimensions. The topsoil shall also be free from any material that will prevent the formation of a suitable seedbed or prevent seed germination and plant growth.

Seed: Shall meet the requirements of Section M.13.04 of Form 818 and be fresh and clean and new crop seed composed of an evenly graded mixture by proportion and testing minimum percentages of purity and germination indicated, or as approved by the Engineer.

The grass seed mixture, for lawns with <=3:1 slope with mowing required, shall have no noxious weeds in mix and shall conform to the following CTDOT mixture:

<u>Species</u>	<u>Proportion by Weight (Pounds)</u>	<u>Minimum Purity (Percent)</u>	<u>Minimum Germination (Percent)</u>
VELVET BENTGRASS (ARGOSTIS CANINA) Certified Variety	25	96	85
RED FESCUE (FESTUCA RUBRA L. SSP. RUBRA) Certified Variety	35	97	80
PARTRIDGE PEA (CHAMAECRISTA FASCICULATA) Certified Variety	10	95	90
INDIAN GRASS (SORGHASTRUM NUTANS) Certified Variety	15	95	90
CANADA WILDRYE (ELYMUS CANADENSIS) Certified Variety	5	95	90
KENTUCKY BLUE GRASS (POA PRATENSIS) Certified Variety	10	95	90

Under no circumstances shall annual Ryegrass, Italian Rye, or any other seed be added to the seed mixture.

**RESTORATION OF LAWN AND WETLAND AREAS
AND EROSION CONTROL BLANKET**

The seed mixture for channel embankments and lawns >3:1 slope with mowing not required shall have no noxious weeds in mix and shall generally conform to the following requirements:

	Proportion by Weight (Percent)	Minimum Germination (Percent)
Creeping Red Fescue	54.0	85
Redtop	5.0	85
Crown Vetch	40.0	90
Other Ingredients	1.0	-

The seed mixture for wetlands areas shall be submitted to the Engineer for review and approval.

The seed mixture for wildflower mix shall be submitted to the Engineer for review and approval.

“Temporary” grass seed shall be annual ryegrass, or an approved equal. The temporary grass shall be used for topsoil and similar material stockpiles that are not to be used within 30 days or used for other applications as directed by the Engineer or submitted to the Engineer for review and approval.

Erosion control blanket: shall be a machine produced mat consisting of 100% coconut fiber. The blanket shall be of consistent thickness with the coconut fiber evenly distributed over the entire area of the mat. The blanket shall be covered on the top side with heavyweight photodegradable polypropylene netting having ultraviolet additives to delay breakdown and an approximate 5/8 inch x 5/8 inch mesh, and on the bottom side with a lightweight photodegradable polypropylene netting with an approximate 1/2 inch x 1/2 inch mesh. The blanket shall be sewn together on 1 1/2 inch centers with degradable thread.

Coconut fiber erosion control blanket shall be C125 as manufactured by North American Green, or approved equal. The C125 erosion control blanket shall have the following properties:

<u>Material content</u>	
Coconut Fiber	100%
Netting	Both sides, heavyweight UV stabilized (3 lb/1000 sq ft approx wt)
Thread	100% Black Polypropylene

**RESTORATION OF LAWN AND WETLAND AREAS
AND EROSION CONTROL BLANKET**

Physical Specifications

Width	6.67 feet
Length	108 feet
Weight	44 lbs +/- 10%
Area	80 sq yds
Stitch spacing	1.5 inches

Wire staples are to be produced from 11 gauge .118 to .120 bright basic industrial quality 1008/1010 wire, minimum cast, light oil protection. The staples shall be produced in a 6" x 1" x 6" U-shaped configuration.

CONSTRUCTION DETAILS

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

The existing ground shall be graded to a reasonably true surface.

Topsoil shall be spread and shaped to meet existing elevation, after settlement and compaction has occurred, and have a minimum depth of four (4) inches with all stone larger than ½" removed.

In wetland areas, 8" of native topsoil/organic matter shall be stripped, stockpiled and reused for wetlands plantings.

It shall be the Contractor's responsibility to restore to the 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.

Examine work area before proceeding with any work and notify the Engineer in writing on conditions which may prevent the proper execution of this work. Failure to report unsuitable conditions will require the contractor to rectify unacceptable work at no additional cost to the Town.

Allow the planting area soil surface to dry out for one day only prior to the hydroseeding application. Exercise care not to allow the soil surface to be overly saturated with water prior to the hydroseeding installation. At the same time the soil surface should not become too dry during this period. There should be some residual moisture within the first 1/4 inch of the soil surface.

Notify the Engineer at least 48 hours prior to starting the hydroseeding operation. The Engineer shall be present during the hydroseeding operation and has final determination if conditions are acceptable for hydroseed application.

Application rates for hydroseed shall be as defined by the manufacturer.

RESTORATION OF LAWN AND WETLAND AREAS AND EROSION CONTROL BLANKET

Apply the hydroseed in the form of a slurry consisting of organic soil amendments, commercial fertilizer, and any other chemicals that are called out. When hydraulically sprayed onto the soil, the mulch shall form a blotter-like material. Direct the spray operation so that this procedure will drill and mix the slurry components into the soil, the slurry spray will also penetrate the soil surface, thus ensuring maximum impregnation and coverage. The impregnation and mixing of the components will help in retaining moisture while stabilizing soil surface from superficial erosion.

Do not leave the hydroseeding slurry components in the hydroseeding machine for more than two (2) hours because of possible seed destruction. If slurry components are left idle for more than two hours in the machine, add 50% more of the originally specified seed mix to any slurry mixture which has not been applied within the two hours after mixing. Add 75% more of the original seed mix to any slurry mixture which has not been applied eight (8) hours after mixing. All mixtures more than eight (8) hours old, must be disposed, offsite, at the contractor's expense.

Spray the area with a uniform visible coat, using the dark color of the cellulose fiber as a visual guide. The slurry shall be applied in a downward drilling motion via a fan stream nozzle. Insure that all of the slurry components enter and mix with the soil. Insure the uniformity of the hydroseed application.

Exercise special care to prevent any of the slurry from being sprayed onto any hardscape areas including concrete walks, fences, walls, buildings, etc. Remove all slurry sprayed onto these surfaces at the contractor's expense.

Contractor shall save all seed and fertilizer tags and fiber mulch bags for the Engineer to verify compliance with the drawings and specifications.

The Contractor shall maintain the area until sufficient seed growth has occurred to stabilize the soil. This includes the restoration of all eroded areas, and the placing and maintaining of erosion control measures as required to prevent further erosion.

Normal seeding season shall be:

For Grass:

Spring seeding - March 15 to June 30

Fall seeding - August 15 through October 31

For Wildflower:

Spring seeding - March 1 to May 15

Fall seeding - November 15 to December 15

Seeding at other times will be allowed only with permission of the Engineer.

RESTORATION OF LAWN AND WETLAND AREAS AND EROSION CONTROL BLANKET

The Contractor may be required to top dress and reseed certain areas to achieve sufficient, uniform turf establishment.

MAINTENANCE

Upon completion of hydroseeding operations, maintain all hydroseeded areas for a period of 90 calendar days as follows:

1. Germination stage irrigation: Approximately 24 hours after hydroseeding the planting areas, initiate the watering sequence. Leave the water on long enough to moisten the soil thoroughly to the depth of the slurry mulch taking care not to super saturate or wash away the slurry and seed. Perform frequent, light irrigation until the seed has germinated. Repair all seed washings and erosion.
2. Establishment stage irrigation: After germination, reduce each watering. The specific watering program shall be approved by the Engineer.

Fertilize all hydroseeded areas with an approved commercial fertilizer approximately thirty (30) calendar days from the start of the maintenance period.

ACCEPTANCE

Final approval and acceptance will be given in writing by the Engineer following a final acceptance inspection. The Engineer reserves the option to extend the maintenance period to achieve complete germination of all turf or other plant materials with a uniform height, color and density throughout all hydroseeded areas. Final acceptance may be given at the end of the 90 calendar day maintenance period if an acceptable germination of turf and adequate plant establishment has been obtained, as determined by the Engineer.

GUARANTEE AND REPLACEMENT

Provide a guarantee for a period of one (1) year after final acceptance, that the installed grass areas be at least the quality and condition as at the time of acceptance. Rehydroseed unacceptable areas during the guarantee period. The guarantee shall not include damage or loss of turf due to acts of God, acts of vandalism or negligence on the part of the Town.

MEASUREMENT

“Restoration of Lawn Areas” and “Restoration of Wetland Areas” will be measured for payment by the actual number of square yards of topsoil and turf establishment performed in accordance with the Plans and Specifications.

The following items will not be measured separately for payment, but shall be considered as included in the unit price bid for “Restoration of Lawn Areas” or “Restoration of Wetland Areas”:

**RESTORATION OF LAWN AND WETLAND AREAS
AND EROSION CONTROL BLANKET**

1. Excavation
2. Fertilizer, seed or mulch
3. Topdressing and reseeding
4. Water
5. Lawn areas outside the grading limits disturbed by the Contractor

“Erosion Control Blanket” will be measured for payment by the actual number of square yards of erosion control matting installed and accepted. Turf establishment under the erosion control blanket will be measured for payment under the “Restoration of Lawn Areas” item.

PAYMENT

This work will be paid for at the contract unit price bid for "Restoration of Lawn Areas" or “Restoration of Wetlands Areas”, which price shall include all the furnishing and fine grading of slope and lawns areas, topsoil, fertilizer, seed, replacement of lawn structures, labor, tools and equipment incidental thereto.

Any disturbance of lawns beyond the grading limits shown on the Plans shall be restored to its original condition by the Contractor at no expense to the Town of Manchester.

Final payment for this item will not be issued until grass is established to the approval of the Engineer. Partial payments may be made, but in no case will more than 50% of the item be paid until the grass is established to the approval of the Engineer.

“Erosion Control Blanket” will be paid for at the contract unit price bid for “Erosion Control Blanket”, which price shall include all materials, labor, tools and equipment necessary to install the erosion control blanket in accordance with the Plans and Specifications.

Pay Item

Restoration of Lawn Areas

Pay Unit

Square Yard

FENCING

DESCRIPTION

“Chain Link Fence” of the size and type specified includes the furnishing and installation of vinyl coated woven wire fencing of the type and height specified and supported by metal posts where indicated on the plans or as ordered and in conformity with these Specifications.

“Remove Fence” includes the removal of existing fence at the locations shown on the Plans or where directed by the Engineer.

“Reset Fence” shall consist of the removal and resetting of existing fence at the locations shown on the Plans or where directed by the Engineer.

“Chain Link Gate” of the size and type specified includes the furnishing and installation of vinyl coated woven wire gates of the width and height specified and supported by metal posts where indicated on the plans or as ordered and in conformity with these Specifications.

MATERIALS

Chain Link Fence Fabric

Provide fabric in one-piece heights measured between top and bottom of outer edge or selvage knuckle or twist according to “CLFMI Product Manual” and requirements indicated below:

1. Fabric Height: As shown on the Plans
2. Wire: 8 gauge (finished)
3. Mesh Size: 1 ¾ inches; unless otherwise shown on the Plans
4. Zinc Coated Fabric: ASTM A392, Type II, Class 2, 2.0 oz/sf
5. Polymer Coated Fabric: ASTM F 668, Class 2b over zinc coated wire
Color: Black

Fence Framework

Framework, including rails; braces and line, terminal and corner posts shall conform to ASTM F 1043. Provide members with minimum dimensions and wall thickness according to ASTM F 1043 or ASTM F 1083 based on the following:

1. Fence Height: As shown on the Plans
2. Heavy-Industrial-Strength Material: Group IA, round steel pipe, Schedule 40
3. Post/pipe dimensions: As shown on the Plans
4. Coating: Powder coated black for all framework

Swing Gates

1. Posts/Frames: Round powder coated black tubular steel (ASTM F900)
2. Width: Gate leaf width as shown on Plans
3. Framework: Based on gate fabric height as indicated
4. Hinges: 180-degree outward swing, self-closing
5. Latch: Permitting operation from both sides of gate
6. All hardware shall be powder coated black.

FENCING

Fittings

Fittings shall conform to ASTM F626 and as follows:

1. Provide post caps for each post.
2. Provide rail and brace ends for each gate, corner, pull and end post
3. Rail Fittings: Top rail sleeves shall be pressed or round steel tubing not less than 6 inches long; Provide line and corner boulevard clamps for connecting intermediate and bottom rails to posts.
4. Tension Bars: Steel; Provide one bar for each gate and end post and two for each corner and pull post.
5. Tie Wire: Vinyl coated or powder coated No. 6 gage steel wire
6. Coating: Powder coated black for all fittings.

Grout and Anchoring Cement

1. Non-shrink Grout: Factory-packaged, non-staining, non-corrosive grout complying with ASTM C 1107, specifically for exterior applications.
2. Anchoring Cement: Factory packaged, non-shrink, non-staining, hydraulic-controlled expansion cement formulation for mixing with water at project site to create pourable anchoring, patching and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating, and that is recommended by manufacturer for exterior applications.

CONSTRUCTION DETAILS

Stake locations of fence lines, gates and terminal posts for approval by the Engineer prior to installation.

Install chain link fence according to ASTM F 567 and as specified herein.

Drill or hand excavate post holes to diameters and spacing indicated on Plan.

Set posts plumb in concrete and vibrate or tamp for consolidation. Exposed concrete shall be flush to grade. Install dome caps on top of posts.

For fence five (5) feet in height or less where runs of fence are 100 feet over, end posts shall be braced. All corner posts where runs are over 100 feet in either direction shall have two braces. For fence more than five (5) feet in height, end posts shall be braced; and corner posts shall have two braces.

Pull posts with two braces shall be provided for all heights where changes in horizontal or vertical alignment of ten (10) degrees or more occur.

Where braces are required, they shall be spaced as indicated on the plans.

Braces shall be securely fastened to posts by suitable connections and trussed from line post back to post requiring bracing with 3/8-inch round rod, having a turnbuckle adjustment.

FENCING

The top rail shall pass through the base of the line post cap and form a continuous brace from end to end of fence. The rail shall be provided with couplings approximately every 20 feet. The couplings shall be of the outside-sleeve type and at least seven inches (7") long, one (1) coupling in every five (5) to have a heavy spring to take up expansion and contraction in the top rail.

Install intermediate rails if shown on the Plan. Secure to posts with fittings.

Fabric shall be fastened to line posts with bands or wire clamps of No. 6-gage PVC coated steel wire 4-3/4 inches long. These bands shall be spaced approximately 14 inches apart. The fabric shall be fastened to the top rail with tie wires after the fabric has been pulled taut. These tie wires shall be 6-1/4 inches long, spaced approximately 24 inches apart.

Where it is not practicable to conform the fence to the general contour of the ground, as at ditches, channels, etc., the opening beneath the fence shall be enclosed with chain link fabric and sufficiently braced to preclude access, but not to restrict the flow of water.

Install gates in accordance with manufacturer's written instructions, level, plumb and secure for full opening without interference. Gates in fences over 6' high shall include transom section. Attach hardware using tamper-resistant or concealed means. Adjust gates to operate smoothly, easily and quietly, free of binding, warp, excessive deflection, distortion or malfunction throughout the entire operating range. Confirm that latches and locks engage accurately and securely without forcing. Lubricate hardware and other moving parts.

Remove all traces of dirt and soiled areas in accordance with the manufacturer's recommendations or as directed by the Engineer.

MEASUREMENT

"Chain Link Fence" of the size and type specified will be measured for payment by the actual number of linear feet of completed and accepted polyvinyl chloride coated chain link fence of the height specified, measured from outside to outside of terminal posts.

"Remove Fence" will be measured for payment by the actual number of linear feet of existing chain link fence removed. The Contractor and the Engineer shall measure the pay limits for "Remove Chain Link Fence" prior to its removal.

"Reset Fence" will be measured for payment by the actual number of linear feet of fence reset, measured from outside to outside of terminal posts.

"Chain Link Gate" of the size and type specified will be measured for payment by the actual number of linear feet of completed and accepted polyvinyl chloride coated chain link gate, measured from outside to outside of gate posts.

FENCING

The following items will not be measured separately for payment, but shall be considered as included in the unit price bid for “Chain Link Fence” or “Chain Link Gate” of the size and type specified, “Remove Chain Link Fence,” or “Reset Chain Link Fence”:

1. Excavation
2. Backfilling of existing post holes
3. Grout

PAYMENT

This work will be paid for at the contract unit price per linear foot for “Chain Link Fence” or “Chain Link Gate” of the size and type specified, “Remove Chain Link Fence” or “Reset Chain Link Fence”, complete in place, which price shall include all materials, equipment, tools, excavation, backfill, disposal of surplus material and labor incidental thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
Remove Fence	Linear Foot
Reset Fence	Linear Foot

WOODEN STOCKADE FENCE

DESCRIPTION

“Wooden Stockade Fence with Steel Posts” of the height specified, includes the furnishing and installation of permanent steel post reinforced wood fencing at the locations shown and as detailed on the Plan.

“Removable Wooden Stockade Fence with Wood Posts” of the height specified, includes the removal of existing fencing and the furnishing and installation of removable wood post and fencing at the locations shown and as detailed on the Plan.

“Dumpster Gate with Steel Posts” of the height and width specified, includes the furnishing and installation of permanent vinyl coated chain link gates at the locations shown and as detailed on the Plan.

MATERIALS

Wood fence shall be concealable steel post reinforced wood panel fence, Traditional Board Fence with Cap, as manufactured by:

Master Halco, Inc.
3010 Lyndon B Johnson Fwy
Phone (800) 883-8384
www.masterhalco.com

or approved equal.

Concrete: Minimum 28 day compressive strength of 3,000 psi (20 Mpa).

Bolts, nuts and washers shall be galvanized steel conforming to the requirements of ASTM A307. Galvanizing shall be in accordance with the requirements of ASTM A153.

Grout shall be non-shrink grout conforming to the requirements of Section M.03.01-12 of Form 817.

CONSTRUCTION DETAILS

Wood fence shall be installed in accordance with manufacturer’s instructions and the detail shown in the Plan.

Dumpster gate shall be installed in accordance with the detail shown in the Plan.

MEASUREMENT

“Wooden Stockade Fence with Steel Posts” of the height specified will be measured for payment by the actual number of linear feet of fence, installed and accepted, measured from the center of outside posts.

WOODEN STOCKADE FENCE

“Removable Wooden Stockade Fence with Wood Posts” of the height specified will be measured for payment by the actual number of linear feet of fence, installed and accepted, measured from the center of outside posts.

“Dumpster Gate with Steel Posts” of the height and width specified will be measured for payment by the actual number of gates installed and accepted. Double swing gates will be measured as a single unit.

The following items will not be measured separately for payment, but shall be considered as included in the unit price bid for “Wooden Stockade Fence with Steel Posts”, “Removable Wooden Stockade Fence with Wood Posts”, and “Dumpster Gate with Steel Posts”:

1. Excavation and backfill
2. Brackets and other miscellaneous hardware
3. Sonotube and broken or crushed stone and gravel
4. The removal and disposal of any existing fencing within the identified limits on the Plan

PAYMENT

The contract unit price for “Wooden Stockade Fence with Steel Posts”, “Removable Wooden Stockade Fence with Wood Posts”, and “Dumpster Gate with Steel Posts” shall include the removal of existing fence, fabricating and furnishing the fence or gate, posts and mounting hardware and all materials, equipment, labor and work incidental thereto to provide a complete fence or gate installation.

<u>Pay Item</u>	<u>Pay Unit</u>
Removable Wooden Stockade Fence with Wood Posts (6' High)	Linear Feet

PAVEMENT MARKINGS

DESCRIPTION

“Epoxy Resin Pavement Markings” shall consist of furnishing and installing reflectorized white and yellow epoxy resin pavement markings of the width and color specified at the locations indicated on the plan. Epoxy resin pavement markings include center lines, lane lines and shoulder lines.

“Epoxy Resin Pavement Markings, Symbols and Legends” shall consist of furnishing and installing reflectorized markings, symbols or legends of the width and color specified at the locations indicated on the plan. Epoxy resin pavement markings, symbols and legends include crosswalks, stop bars and lane arrows.

“Painted Pavement Markings” shall consist of furnishing and installing white and yellow painted pavement markings of the width and color specified at the locations indicated on the plan. Painted pavement markings include center lines, lane lines and shoulder lines.

“Handicap Parking Symbol” shall consist of furnishing and installing white painted handicap parking symbols on pavement surfaces at locations specified on the plans.

“Remove Pavement Markings” shall consist of the eradication of existing pavement markings at the locations indicated on the plan.

MATERIALS

Materials for epoxy resin pavement markings shall conform to the requirements of Section M.07.22 of Form 817.

Materials for painted pavement markings shall conform to the requirements of Section M.07.20 of Form 817.

Glass beads shall conform to the requirements of Section M.07.30 of Form 817.

CONSTRUCTION DETAILS

Pavement markings shall be removed from the pavement by any method that does not materially damage the surface or texture of the pavement. Any damage to the pavement surface caused by pavement marking removal shall be repaired by the Contractor at his expense by methods acceptable to the Engineer.

Equipment used to apply pavement markings shall include an applicator truck of adequate size and power to apply an epoxy resin material in a continuous pattern and portable glass bead applicators, one for each size bead, designed to provide uniform and complete coverage of the epoxy binder by a controlled free fall method. Pressurized glass bead application shall not be used.

For markings applied over existing pavement, the existing pavement shall be thoroughly power washed.

PAVEMENT MARKINGS

Glass beads shall be immediately applied after application of the epoxy resin to provide an immediate no-track system.

The Contractor shall be responsible for all horizontal control and layout of the work.

The material shall be in “no-track” condition within fifteen minutes. Adequate protection shall be given to newly painted markings to assure the “no-track” condition.

When stencils are used, care must be used when removing the stencils so that the epoxy resin does not drip on the road and that the applied markings have edges which are clean, straight and neat.

Epoxy resin pavement markings shall be warranted not to fade, lift, shrink, tear, rollback, distort, or chip for one year under normal vehicular traffic and maintenance activities.

For crosswalks, only glass beads conforming to the requirements of Grading “A” (smaller beads) shall be applied at a rate of 25 lbs/gallon of epoxy material.

MEASUREMENT

“Epoxy Resin Pavement Markings” shall be measured for payment by the actual number of linear feet of epoxy resin pavement markings installed and accepted. Double yellow centerlines will be measured as two separate lines.

“Epoxy Resin Pavement Markings, Symbols and Legends” shall be measured for payment by the actual number of square feet of epoxy resin pavement markings, symbols and legends installed and accepted.

“Painted Pavement Markings” shall be measured for payment by the actual number of linear feet of painted pavement markings installed and accepted. Double yellow centerlines will be measured as two separate lines.

“Handicap Parking Symbol” shall be measured for payment by the actual number of symbols installed and accepted.

“Remove Pavement Markings” shall be measured for payment by the actual number of square feet of pavement markings removed in accordance with these Specifications.

PAYMENT

This work shall be paid for at the contract unit price bid for “Epoxy Resin Pavement Markings”, “Epoxy Resin Pavement Markings, Symbols and Legends”, “Painted Pavement Markings”, “Handicap Parking Symbol” or “Remove Pavement Markings”. This price shall be for all the work required by this section and all materials, equipment, tools and labor incidental thereto.

PAVEMENT MARKINGS

Pay Item

Epoxy Resin Pavement Markings, Symbols and Legends
4" Yellow Painted Pavement Markings
4" White Painted Pavement Markings

Pay Unit

Square Foot
Linear Foot
Linear Foot

TRAFFIC CONTROL SIGNS

DESCRIPTION

“Sign Face – Sheet Aluminum” includes the furnishing and installation of permanent sign face sheet aluminum signs of the type specified on new breakaway type metal sign posts at the locations indicated on the plans. It does not include the furnishing and installation of temporary construction signs which are included in the unit price for the item “Maintenance and Protection of Traffic”.

“Install Sign (Town Furnished)” shall consist of installing new ground mounted signs on new breakaway type metal sign posts at the locations shown on the Plans or where directed by the Engineer. Signs and posts will be furnished by the Town.

“Install Sign Overhead Mounted (Town Furnished)” shall consist of installing overhead signs on mast arms or span wires at the locations shown on the Plans or as directed by the Engineer. Signs and mounting brackets will be furnished by the Town.

“Reset Sign” includes the resetting of existing signs on new breakaway type metal sign posts furnished by the Contractor at the locations shown on the Plans or where directed by the Engineer.

MATERIALS

Reflective sheeting shall conform to the requirements of Section M.18.09.01, Type I, II or III of Form 817.

Silk screening shall conform to the requirements specified by the reflective sheeting manufacturer.

Metal sign posts shall conform to the requirements of Section M.18.14 of Form 817.

CONSTRUCTION DETAILS

Placement and dimensions of copy, border and mounting holes shall conform to details of the Department of Transportation typical details.

Reflective sheeting shall be applied in such a manner that the finished sign shall be wrinkle and bubble free.

Cutout, copy and border shall conform to the manufacturer’s requirements.

Signs shall be mounted on metal sign posts. Metal sign posts shall be driven or the holes augered and the backfill thoroughly tamped after the posts have been set level and plumb. When signs are to be placed in new concrete sidewalk, the Contractor shall provide a PVC sleeve, at the locations approved by the Engineer, to accommodate the resetting of signs.

TRAFFIC CONTROL SIGNS

MEASUREMENT

“Sign Face – Sheet Aluminum” of the type specified will be measured for payment by the actual number of square feet of sign face-sheet aluminum of the type specified, installed and accepted.

“Install Sign (Town Furnished)” will be measured for payment by the actual number of signs installed and accepted. Multiple signs on one post will each be measured for payment.

“Install Sign Overhead Mounted (Town Furnished)” will be measured for payment by the actual number of signs installed and accepted.

“Reset Sign” will be measured for payment by the actual number of signs installed and accepted.

The following items will not be measured separately for payment, but shall be considered as included in the unit price bid for “Sign Face – Sheet Aluminum”, “Install Sign (Town Furnished)”, “Install Sign Overhead Mounted (Town Furnished)” or “Reset Sign”:

1. Metal breakaway sign posts
2. PVC Sleeves
3. Brackets and other miscellaneous hardware

PAYMENT

The contract unit price for “Sign Face – Sheet Aluminum” shall include fabricating and furnishing the sign, posts and mounting hardware and all materials, equipment, labor and work incidental thereto to provide a complete sign installation.

The contract unit price for “Install Sign (Town Furnished)” shall include all labor, equipment, and incidental work involved in installing Town furnished signs at locations shown on the Plans or where directed by the Engineer.

The contract unit price for “Install Sign Overhead Mounted (Town Furnished)” shall include all labor, equipment and incidental work involved in installing Town furnished overhead mounted signs at locations shown on the Plans or where directed by the Engineer.

The contract unit price for “Reset Sign” shall include all labor, equipment, materials and incidental work involved in installing existing signs on new breakaway metal posts at locations shown on the Plans or where directed by the Engineer.

Pay Item

Reset Sign

Pay Unit

Each

CONSTRUCTION STAKING

DESCRIPTION

“Construction Staking” shall consist of retaining a Land Surveyor licensed in the State of Connecticut who will be responsible for all locations, layout and reference staking necessary for proper control and satisfactory completion of the Work and acceptance of the Contract as specified herein.

The Contractor/Contractor’s Surveyor shall be solely responsible for the accuracy of the line and grade of all features of the Work. Any errors or apparent discrepancies found in previous surveys, Plans, Specifications, or Special Provisions shall be called to the Engineer’s attention by the Contractor for correction or interpretation prior to proceeding with the Work.

All construction staking shall be performed by qualified engineering or surveying personnel, under the direction of a Land Surveyor licensed in the State of Connecticut who is trained, experienced and skilled in construction layout.

The Contractor’s surveyor shall provide and maintain for the periods needed, as determined by the Engineer, reference stakes at various intervals outside the slope limits. Further, the Contractor shall provide and maintain reference stakes at 50-foot station intervals along the baseline/offset baseline, immediately prior to and during the formation of sub-grade and the construction of all subsequent pavement layers.

Any and all monumentation within the construction area shall be clearly identified in the field with stakes, paint or other measures and preserved by the Contractor. The Contractor’s Land Surveyor shall reset or replace disturbed survey markers, streetline monuments and private property markers when directed by the Engineer at no additional cost.

“Set Private Property Marker” shall consist of retaining a Land Surveyor licensed in the State of Connecticut who will be responsible for the setting of markers in place of those impacted by the Work at the locations indicated on the Plan.

MATERIALS

Granite stone monuments shall be 6" x 6" x 3'-9" (± 3 ") surveyors bound sawn or dressed top with a 1/2" Dia. x 1" Deep hole.

Iron pins shall be three foot (36"), #5 reinforcing rod in conformance with Article M.06.01 in Form 817 with a plastic cap set flush with grade. The plastic cap shall bear the name and license number of the responsible Land Surveyor.

Any concrete monuments disturbed during construction shall be replaced with granite stone monuments and any disturbed pipes and pins shall be replaced with iron pins as specified herein and directed by the Engineer at no additional cost.

The setting of PK/MAG type spikes may be permitted by the Engineer, if in the opinion of the Engineer, iron pins/monuments cannot be reset.

CONSTRUCTION STAKING

The setting of private property markers, as indicated on the Plan, shall be set with Brass Disks (1" flat face) supplied by the Town unless otherwise directed by the Engineer.

Granular Fill shall conform to the requirements of "Granular Fill" elsewhere in these Specifications.

CONSTRUCTION DETAILS - GENERAL

Prior to any construction activity, the Contractor shall retain a Land Surveyor licensed in the State of Connecticut who will be responsible for furnishing all horizontal and vertical reference staking necessary for the Contractor to complete the Work and the Engineer to inspect the Work and for preparation of an electronic as-built drawing as defined herein.

The Engineer will supply the Contractor/Contractor's Surveyor an electronic drawing file of the "General Location Survey" along with the "Proposed Plan", in AutoCAD .dwg format, containing, control, monumentation, baselines and other data to assist with construction staking.

The Contractor shall coordinate with utility companies to provide reference stakes to indicate the proposed edge of road/way in the vicinity of all new or relocated utility poles and underground utility lines. All stakes shall be properly referenced as to station, offset and shall be referenced to the proposed grade.

The Contractor shall retain a Land Surveyor licensed in the State of Connecticut who will be responsible for locating the existing "Private Property Markers" impacted by the Work and "Set Private Property Markers" at the appropriate time and locations as previously determined by said Surveyor per the Plans.

LOCATION OF EXISTING STREET LINE & PROPERTY CORNER MONUMENTATION

Unless approved otherwise by the Engineer, the Contractor's surveyor shall complete the following field work prior to commencement of clearing and grubbing operations and other construction activities:

- Verify the existing control traverse as shown on the "General Location Survey", which shall be utilized for all locations.
- Locate all existing street line monumentation and property corner markers within the construction area.

All locations shall be made to A-2 standards as defined in the "Minimum Standards for Surveys and Maps in the State of Connecticut", as adopted by The Connecticut Association of Land Surveyors Inc. on September 26, 1996, as amended.

Upon completing location of the existing control traverse and monumentation, the following information shall be delivered to the Engineer within **TEN (10) CALENDAR DAYS**:

CONSTRUCTION STAKING

1. All original indexed field books, survey notes, electronic field book files, computation sheets.
2. An electronic drawing file provided in a compatible AutoCAD or .dxf format showing all monumentation, control points, and ties at a scale consistent with the “General Location Survey” or as designated by the Town of Manchester. This file shall be submitted for approval prior to the contractor beginning the Clearing and Grubbing operation.

Clearing and grubbing and other construction activities in critical areas may be suspended until this information is reviewed and accepted by the Engineer.

MEASUREMENT AND PAYMENT

“Construction Staking” will be measured for payment by the lump sum. The lump sum unit price bid for “Construction Staking” shall include all materials, tools, equipment, labor and work incidental thereto for the work described in this Specification.

Partial payments for this item shall be as follows:

1. Payment equal to 25% of the lump sum bid price upon successful delivery of the electronic existing control traverse and monumentation location survey.
2. Payment equal to 75% of the lump sum bid price upon completion of construction activities.

The work “Set Private Property Marker” shall be paid for at the contract unit price bid. This price shall be for all the work required by this section and all materials, equipment, tools and labor incidental thereto.

<u>Pay Item</u>	<u>Pay Unit</u>
Construction Staking	Lump Sum

ELECTRONIC AS-BUILT DRAWING

DESCRIPTION

“Electronic As-Built Drawing” shall consist of retaining a Land Surveyor licensed in the State of Connecticut who will be responsible for preparing the electronic Final Control Survey including “as-built” locations and elevations of all features, including public utilities, constructed during the project, to be provided to the Engineer. Submission of an electronic drawing file in a compatible AutoCAD .dwg or .dxf format and a signed and sealed final mylar is required.

MATERIALS

N/A

CONSTRUCTION DETAILS - GENERAL

Prior to any construction activity, the Contractor shall retain a Land Surveyor licensed in the State of Connecticut who will be responsible for preparation of an electronic as-built drawing as defined herein.

FINAL CONTROL SURVEY

The Contractor/Contractor’s Surveyor shall, after the completion of the project but before final acceptance, provide the Engineer, a survey control traverse extending through the limits of the project along the constructed roadway, tying into the original project control at or beyond the project limits. This traverse shall be run in compliance with Section III of the Location Survey Manual, Bureau of Highways, Connecticut Department of Transportation, revised June 1997, except as herein after provided. All work to be done by or under the immediate supervision of a Land Surveyor licensed in the State of Connecticut. This traverse shall follow the procedures as referenced in the above document for a primary control traverse. The values of each control point shall be shown on Town Control. Each control point set shall be classified as “semi-permanent” in nature and have three (3) ties per point shown to the nearest 0.01 of a foot. Prior to the establishment of the Final Control Survey, a meeting between the Engineer, Contractor and Contractor’s Surveyor is required.

All monumentation previously located will be verified including all newly set/reset monumentation for each Control Point.

Upon completion of the Final Control Survey, the following information shall be delivered to the Engineer in no later than **NINETY (90) CALENDAR DAYS**:

1. All original indexed field books, survey notes, electronic field book files, sketches, computation sheets.
2. An electronic drawing file provided in a compatible AutoCAD .dwg or .dxf format, which shall be submitted, complete with the following:
 - a. All point data (P,N,E,Z,D) and indicating all monumentation, control points with ties, baseline that includes stationing, geometry and coordinate labels.
 - b. Electronic points for field shots obtained for all new sanitary, storm and water distribution system facilities.

ELECTRONIC AS-BUILT DRAWING

- c. Linework and labels shall include, but are not limited to, structures with top of frame and invert elevations, pipes with sizes and materials, gate valves and fire hydrants. New underground pipes and other system components not visible at the surface such as water services and sanitary sewer laterals shall be provided in their approximate locations based on the Contractor's record drawings.
 - d. As-built locations of all types of sidewalks, curbs, sidewalk ramps, driveway openings, guide rail, utility poles, light poles, traffic signs, pavement markings and protective fence.
3. A final mylar plan of the Final Control Survey that includes all information identified above and is signed and sealed the Contractor's Surveyor.

Development of an electronic as-built drawing by the licensed Land Surveyor does not release the Contractor of any responsibility to maintain separate record drawings during construction as identified in the General Conditions of these Specifications.

MEASUREMENT AND PAYMENT

"Electronic As-Built Drawing" will be measured for payment by the lump sum. The lump sum unit price bid shall include one final mylar plan and one electronic drawing file in a compatible AutoCAD .dwg or .dxf format with all information identified herein, raw and revised data collection files and field books, and all materials, tools, equipment, labor and work incidental thereto for the work described in this Specification.

Full payment will not be made until the submission has been reviewed and approved by the Engineer as being complete, including demonstrating all existing monumentation and property corners have been adequately preserved or replaced.

Pay Item

Electronic As-Built Drawing

Pay Unit

Lump Sum

MAINTENANCE AND PROTECTION OF TRAFFIC

DESCRIPTION

“Maintenance and Protection of Traffic” includes the furnishing, installation, maintenance, adjusting, cleaning, storing and removal when no longer required of all temporary signs (sheet aluminum or plywood), sign supports, cones, drums, barricades or other approved traffic control devices necessary to maintain and protect traffic within the project area in accordance with the Plans, Specifications, the Manual of Uniform Traffic Control Devices (MUTCD), the Town of Manchester Traffic Control Ordinance, or as directed by the Engineer.

SUBMITTALS

Unless a Traffic Detour Plan is provided elsewhere in these specifications, all temporary road closures and detours proposed by the Contractor must be approved by the Engineer prior to implementation. In these instances, the Contractor shall submit a plan of the proposed detour, complete with sign patterns, and estimated duration of detour to the Engineer for approval at least seven (7) days prior to execution. Detours will only be considered for infrequent, short-term operations.

MATERIALS

Traffic Drums

The traffic drums shall be manufactured plastic or rubber designed in accordance with the latest edition of the MUTCD. The device shall be stabilized with sandbags or other approved means. The traffic drum shall have, at a minimum, two 4” wide retroreflective orange stripes and two 6” wide retroreflective white stripes. The stripes shall be placed horizontally and alternated with the orange stripe on top. The sections of the traffic drum not covered with retroreflective sheeting shall be orange. Either Type III or Type VI Retroreflective Sheeting, in accordance with Section M.18.09.01 of Form 817 shall be used

Traffic Cones

Traffic Cones shall be constructed of materials to a thickness to withstand impact without damage to cones or to vehicles. The traffic cones shall be 42” tall and of sufficient mass or have bases to which ballast may be added to assure that they will not be blown over or displaced by wind from passing vehicles. Traffic cones shall be reflectorized utilizing Type VI retro reflective sheeting in accordance with Sub article M.18.09.01 of Form 817.

Barricades

Barricades shall conform to the requirements of Section 9.79.02 of Form 817.

Construction Area Signs

Construction Area signs shall be sheet aluminum or plywood with necessary supports. Signs faces shall be of retro reflective sheeting, High Intensity Prismatic (Type III) and conform to section 12.20 of Form 817. When the signs are no longer required on the project, they shall remain the property of the Contractor.

MAINTENANCE AND PROTECTION OF TRAFFIC

Opposing Traffic Lane Dividers

Opposing Traffic Lane Dividers shall conform to the requirements of Section 6F.76 of the MUTCD utilizing Type III Reflective sheeting

Any other traffic control devices shall meet the minimum material requirements of Form 817 and the Manual of Uniform Traffic Control Devices (MUTCD).

RESTRICTIONS

During working hours, the Contractor shall maintain at least one lane of traffic a minimum 10' in width on a gravel or paved surface with certified, uniformed flaggers directing traffic throughout the project area unless otherwise directed by the Engineer. At the end of each work day, the Contractor shall open the roadway to travel in both directions on a gravel or paved surface at least 20' in width with all applicable signs, cones, drums, barricades and lane dividers required by the Engineer.

The Contractor shall schedule operations such that travel by the general public on gravel surfaces is limited to two (2) weeks.

Temporary transverse drop-offs between pavement and milled pavement or between pavement and gravel shall have a maximum 10:1 slope. Temporary longitudinal drop-offs between pavement & milled pavement or between pavement and gravel shall have a maximum 3:1 slope.

REQUIREMENTS

The Contractor shall maintain and protect traffic in the project area in accordance with the requirements and regulations of the Town of Manchester, and these Specifications. Unless otherwise specified, the Contractor must maintain pedestrian and vehicular traffic to permit access to businesses, factories, residences, and intersecting streets.

1. *Advanced Warning:* It shall be the sole responsibility of the Contractor to forewarn the Town's Local Regulatory Agencies (including but not limited to the Public Works, Police and Fire Departments and Board of Education) at least 72 hours in advance of changes in traffic patterns due to reduction of pavement widths or closing of streets.
2. *Access:* The Contractor shall arrange his/her operations to properties along the street including temporary bridges to driveways, and provide access to fire hydrants, manholes, gate boxes, or other utilities. Whenever any trench obstructs traffic in or to any public way, private driveway, or property entrance, the Contractor shall take such steps as required to maintain necessary traffic and access including temporary bridging if required. The Contractor shall confine his/her occupancy of public or traveled ways to the smallest space compatible with the efficient and safe performance of the work.

The Contractor shall observe and obey all local and state laws, ordinances, regulations and permits in relation to the obstruction of streets and highways, keeping passageways open and protecting traffic where there may be danger from blasting or other construction activities.

MAINTENANCE AND PROTECTION OF TRAFFIC

If the Contractor's operations interfere with the removal or sanding of snow or ice by the public authorities or adjoining land owners, in an ordinary manner with regular highway equipment, the Contractor shall be required to perform such services for the public authorities or adjoining owners without charge. If the Contractor fails to do so, he shall reimburse the said authorities or adjoining owners or the Town for any additional cost to them for doing such work occasioned by conditions arising from the Contractor's operations, occupancy, or trench surfaces, together with any damage to the equipment of said parties by those conditions, or claims of any parties for damage or injury or loss by reason of failure to remove snow or ice or to sand icy spots under these conditions.

3. *Maintenance:* The Contractor shall maintain all traffic control devices on the project. Traffic control devices shall be cleaned periodically to maintain retroreflectivity. Any damaged traffic control devices shall be immediately removed and replaced. It is the Contractor's responsibility to move, adjust or relocate traffic control devices as his operations change.
4. *Non-Performance:* Should the Contractor or his/her employees neglect to maintain traffic control devices as required in these Specifications, the Engineer may shut the work down. If the Contractor fails to take corrective action, the Engineer may immediately and without notice, furnish, install and maintain traffic control devices. The cost thereof shall be borne by the Contractor and may be deducted from any amount due or to become due to the Contractor under this contract.

The Contractor will be held responsible for any damages that the Town, Engineer, Governmental units, or their heirs or assigns may have to pay as a consequence of the Contractor's failure to protect the public from injury, and the same may be deducted from any payments that are due or may become due to the Contractor under this contract.

TRAFFIC CONTROL PATTERNS

Traffic control patterns shall be used when a work operation requires that all or part of any vehicle or work area protrudes onto any part of a travel lane or shoulder. For each situation, the installation of traffic control devices shall be based on the following:

- Speed and volume of traffic
- Duration of operation
- Exposure to hazards

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

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

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

MAINTENANCE AND PROTECTION OF TRAFFIC

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

When installing a traffic control pattern, a “buffer area” must be provided which shall be free of equipment, workers, materials and parked vehicles.

When required by the Engineer, the Contractor shall install temporary marking tape to designate traffic lanes until such time permanent pavement markings included in the Contract are installed.

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

ALLOWABLE ADJUSTMENT OF SIGNS & DEVICES ON TRAFFIC CONTROL PLANS

The traffic control patterns contained herein show the location and spacing of signs and devices under ideal conditions. Signs and devices should be installed as shown on these patterns whenever possible.

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

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

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

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

MAINTENANCE AND PROTECTION OF TRAFFIC

TABLE I – MINIMUM TAPER LENGTHS

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

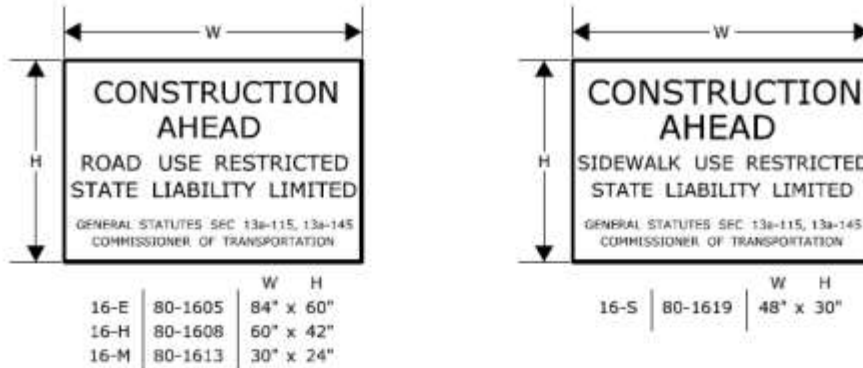
The following DOT coded signs are anticipated to be used during the project. Where applicable, “STATE” shall be revised to “TOWN” and “COMMISSIONER OF TRANSPORTATION” shall be revised to “DIRECTOR OF PUBLIC WORKS”:

- 80-1613 16M
- 80-9701 Detour (right arrow)
- 80-9612 End Road Work
- 80-9602 Road Work Ahead

Series 16 signs shall be post mounted at the beginning and end of the project area as applicable.

MAINTENANCE AND PROTECTION OF TRAFFIC

SERIES 16 SIGNS



THE 16-S SIGN SHALL BE USED ON ALL PROJECTS THAT REQUIRE SIDEWALK RECONSTRUCTION OR RESTRICT PEDESTRIAN TRAVEL ON AN EXISTING SIDEWALK.

SERIES 16 SIGNS SHALL BE INSTALLED IN ADVANCE OF THE TRAFFIC CONTROL PATTERNS TO ALLOW MOTORISTS THE OPPORTUNITY TO AVOID A WORK ZONE. SERIES 16 SIGNS SHALL BE INSTALLED ON ANY MAJOR INTERSECTING ROADWAYS THAT APPROACH THE WORK ZONE. ON LIMITED-ACCESS HIGHWAYS, THESE SIGNS SHALL BE LOCATED IN ADVANCE OF THE NEAREST UPSTREAM EXIT RAMP AND ON ANY ENTRANCE RAMP PRIOR TO OR WITHIN THE WORK ZONE LIMITS.

THE LOCATION OF SERIES 16 SIGNS CAN BE FOUND ELSEWHERE IN THE PLANS OR INSTALLED AS DIRECTED BY THE ENGINEER.

SIGNS 16-E AND 16-H SHALL BE POST-MOUNTED.

SIGN 16-E SHALL BE USED ON ALL EXPRESSWAYS.

SIGN 16-H SHALL BE USED ON ALL RAMPS, OTHER STATE ROADWAYS, AND MAJOR TOWN/CITY ROADWAYS.

SIGN 16-M SHALL BE USED ON OTHER TOWN ROADWAYS.

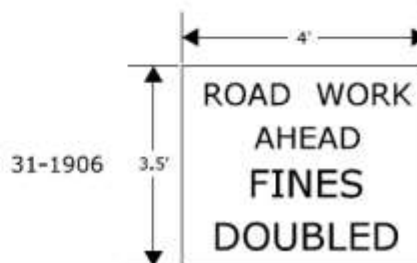
REGULATORY SIGN "ROAD WORK AHEAD, FINES DOUBLED"

THE REGULATORY SIGN "ROAD WORK AHEAD FINES DOUBLED" SHALL BE INSTALLED FOR ALL WORK ZONES THAT OCCUR ON ANY STATE HIGHWAY IN CONNECTICUT WHERE THERE ARE WORKERS ON THE HIGHWAY OR WHEN THERE IS OTHER THAN EXISTING TRAFFIC OPERATIONS.

THE "ROAD WORK AHEAD FINES DOUBLED" REGULATORY SIGN SHALL BE PLACED AFTER THE SERIES 16 SIGN AND IN ADVANCE OF THE "ROAD WORK AHEAD" SIGN.

"END ROAD WORK" SIGN

THE LAST SIGN IN THE PATTERN MUST BE THE "END ROAD WORK" SIGN.



SCALE: NONE

CONSTRUCTION TRAFFIC CONTROL PLAN
REQUIRED SIGNS

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

Charles S. Harow
Charles S. Harow
2012.06.06 11:35:43-0400
PRINCIPAL ENGINEER

MAINTENANCE AND PROTECTION OF TRAFFIC

NOTES FOR TRAFFIC CONTROL PLANS

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

TABLE 1 - MINIMUM TAPER LENGTHS

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

METRIC CONVERSION CHART (1" = 25mm)

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



SCALE: NONE

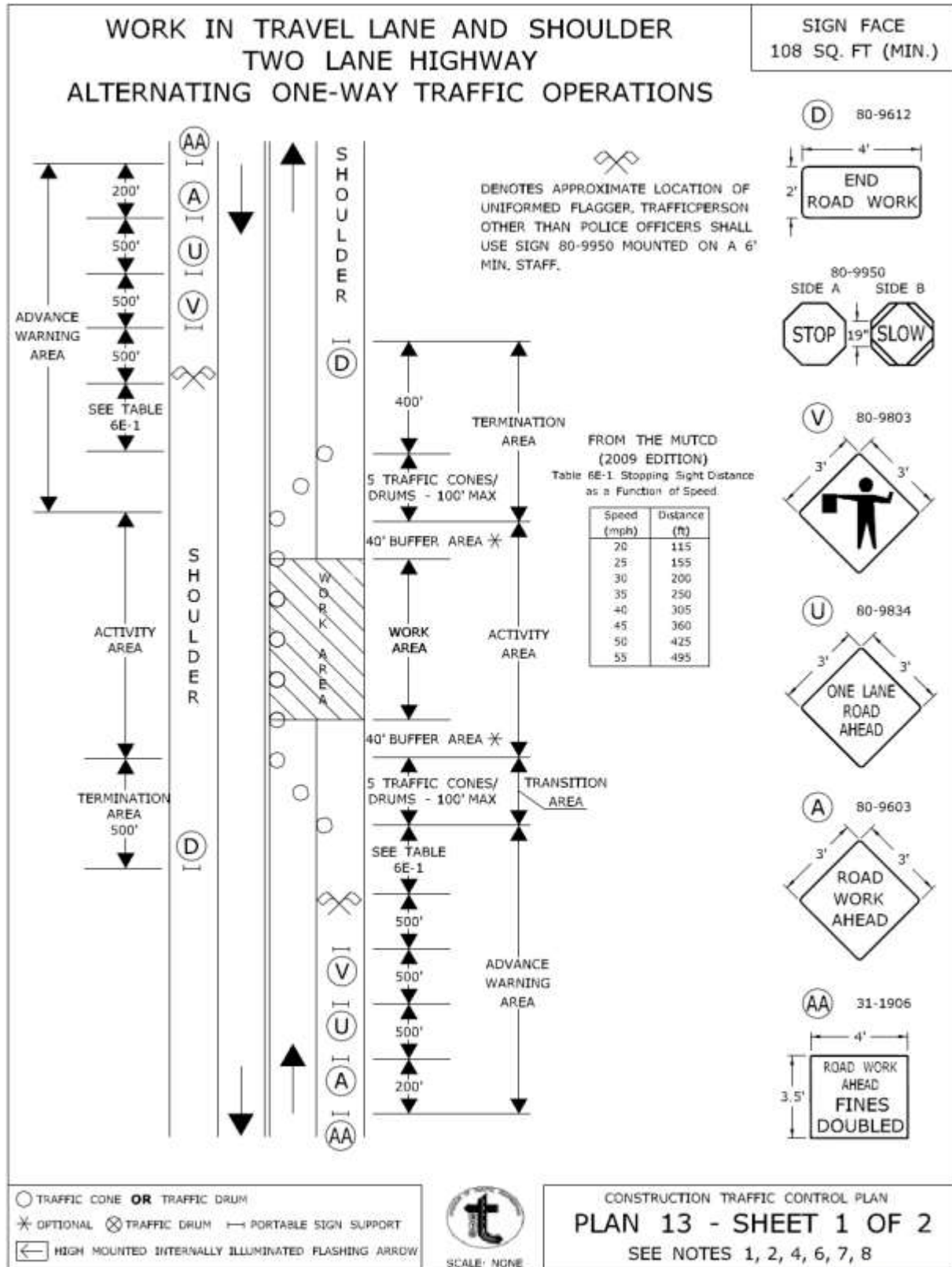
CONSTRUCTION TRAFFIC CONTROL PLAN NOTES

CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

Charles S. Harlow
Charles S. Harlow
2012.06.05 15:50:35-0400
PRINCIPAL ENGINEER

MAINTENANCE AND PROTECTION OF TRAFFIC



CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

Charles S. Harlow
PRINCIPAL ENGINEER

Charles S. Harlow
2012.06.05 15:55:23-04:00

MAINTENANCE AND PROTECTION OF TRAFFIC

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

SIGN FACE
108 SQ. FT (MIN.)

HAND SIGNAL METHODS TO BE USED BY UNIFORMED FLAGGERS

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

A. TO STOP TRAFFIC

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



B. TO DIRECT TRAFFIC TO PROCEED

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



C. TO ALERT OR SLOW TRAFFIC

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



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



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

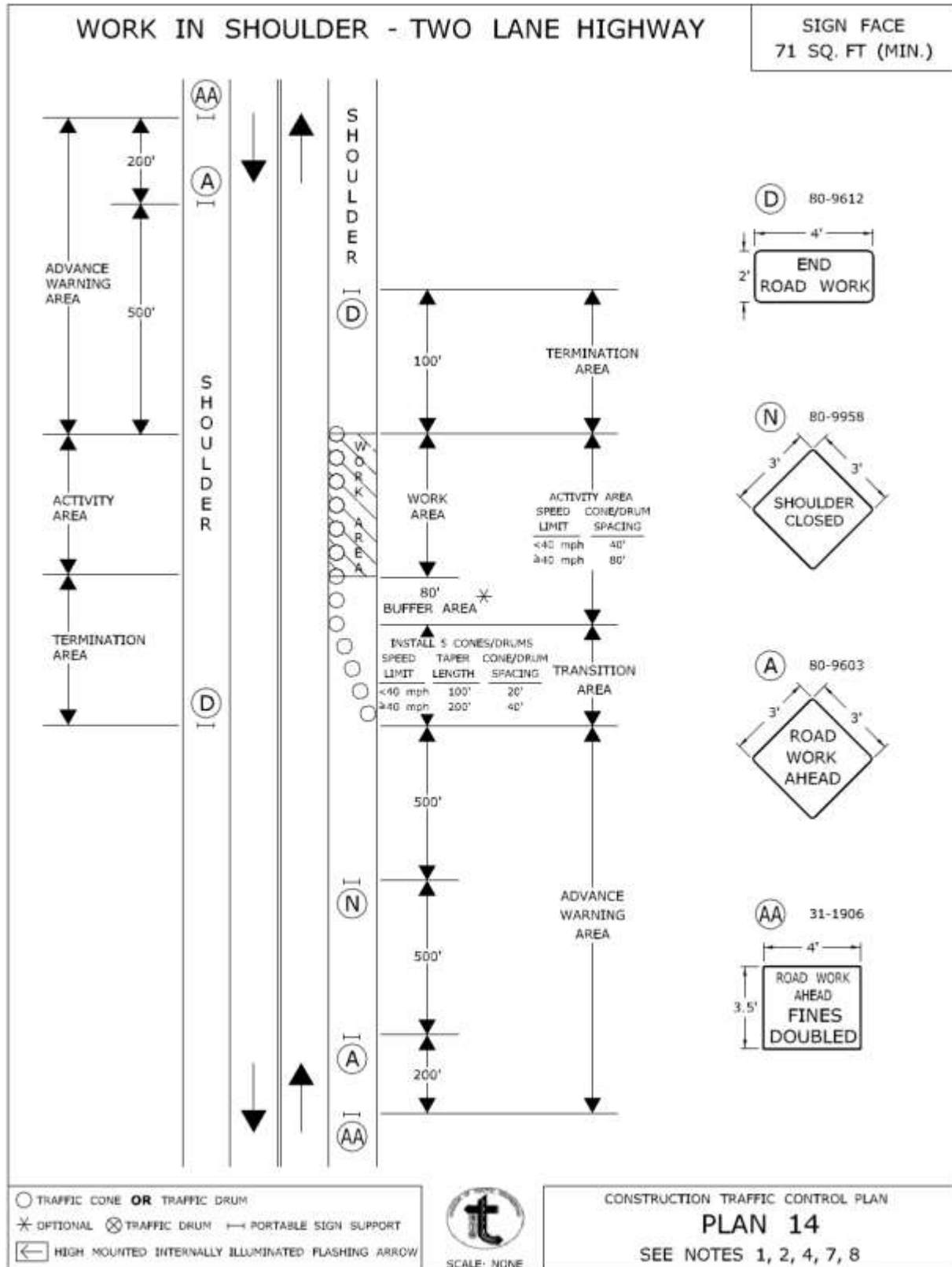
CONNECTICUT DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & CONSTRUCTION

APPROVED

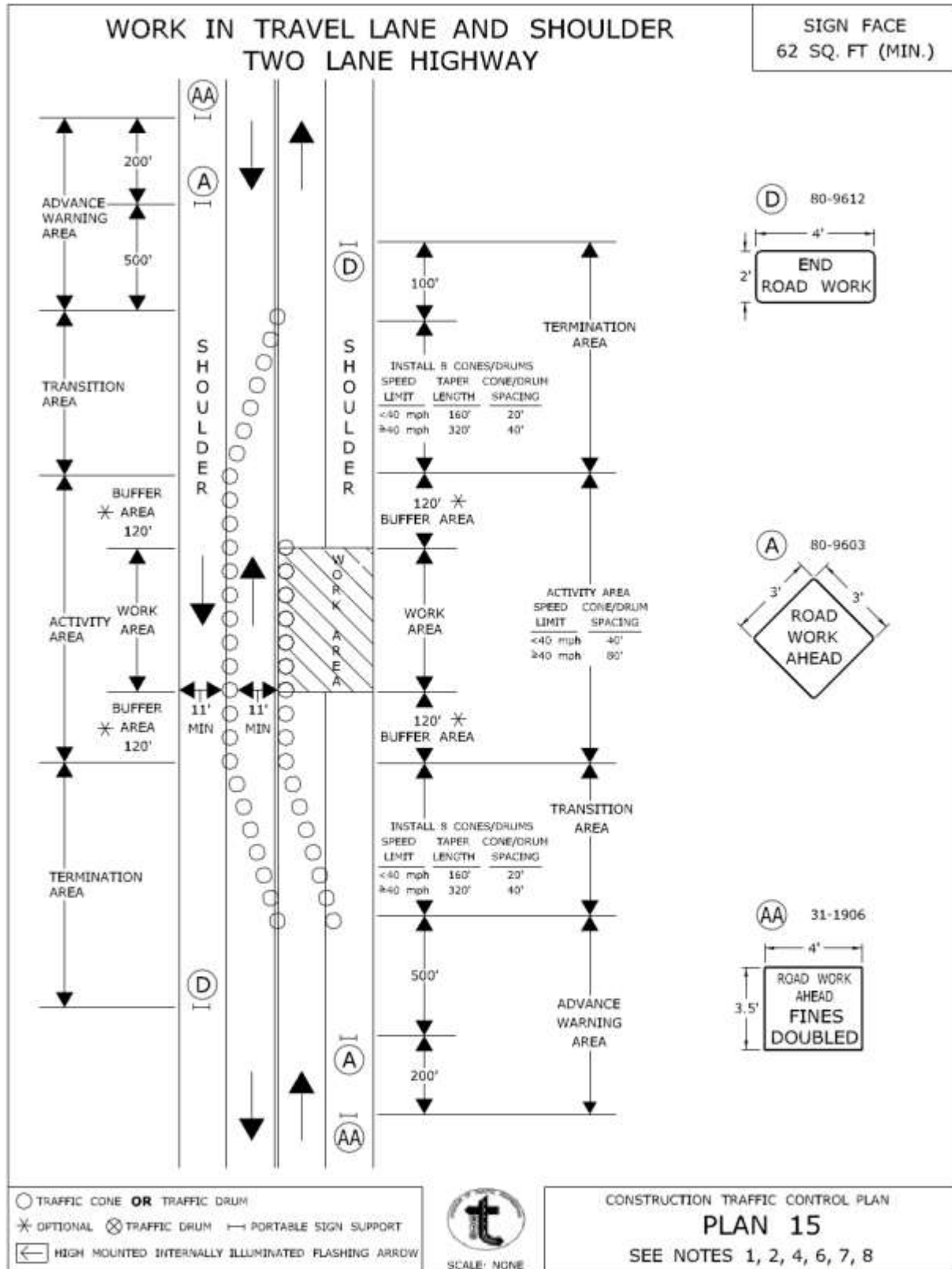
Charles S. Harlow
PRINCIPAL ENGINEER

Charles S. Harlow
2012.06.05 15:55:45-0400

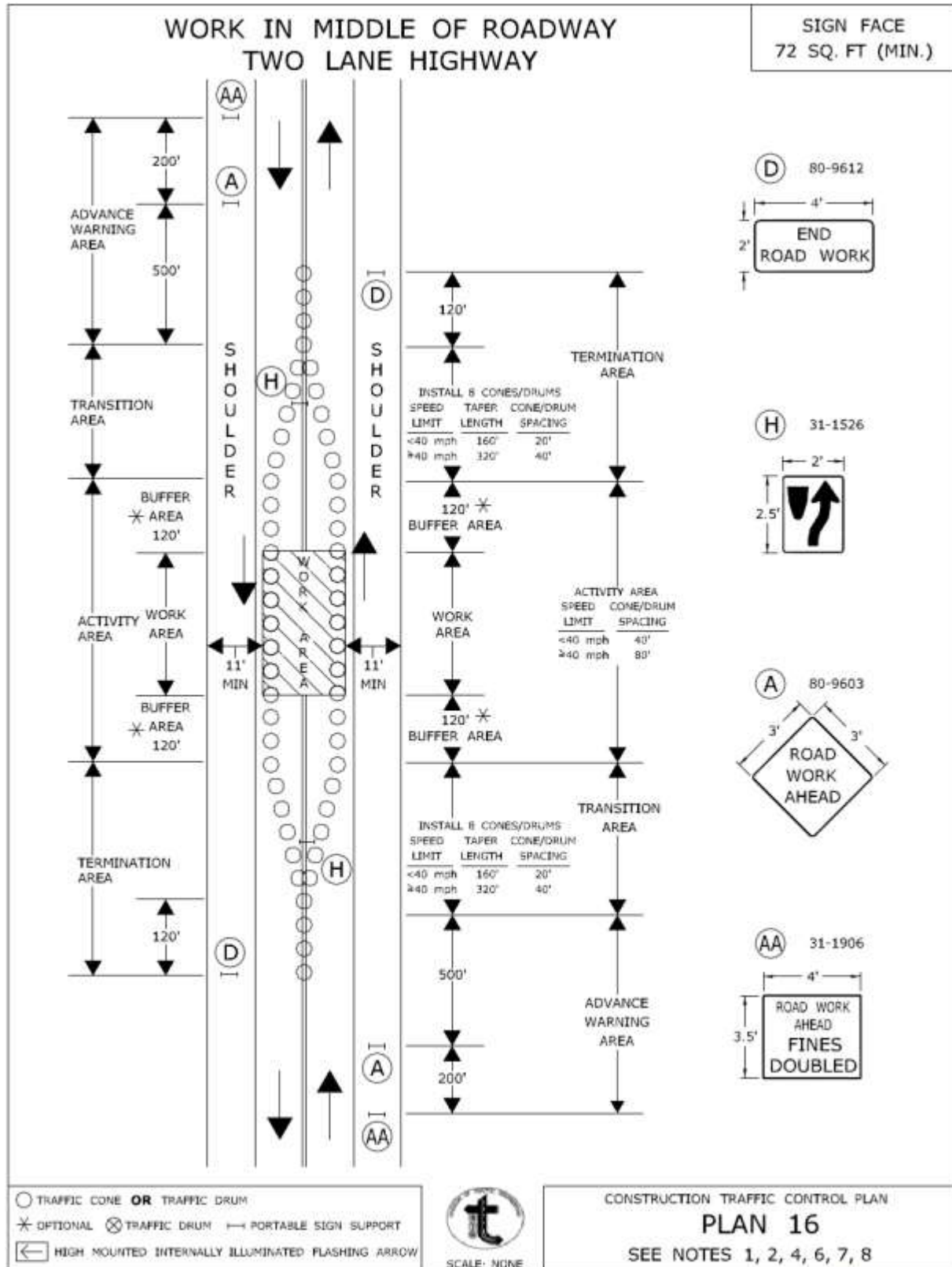
MAINTENANCE AND PROTECTION OF TRAFFIC



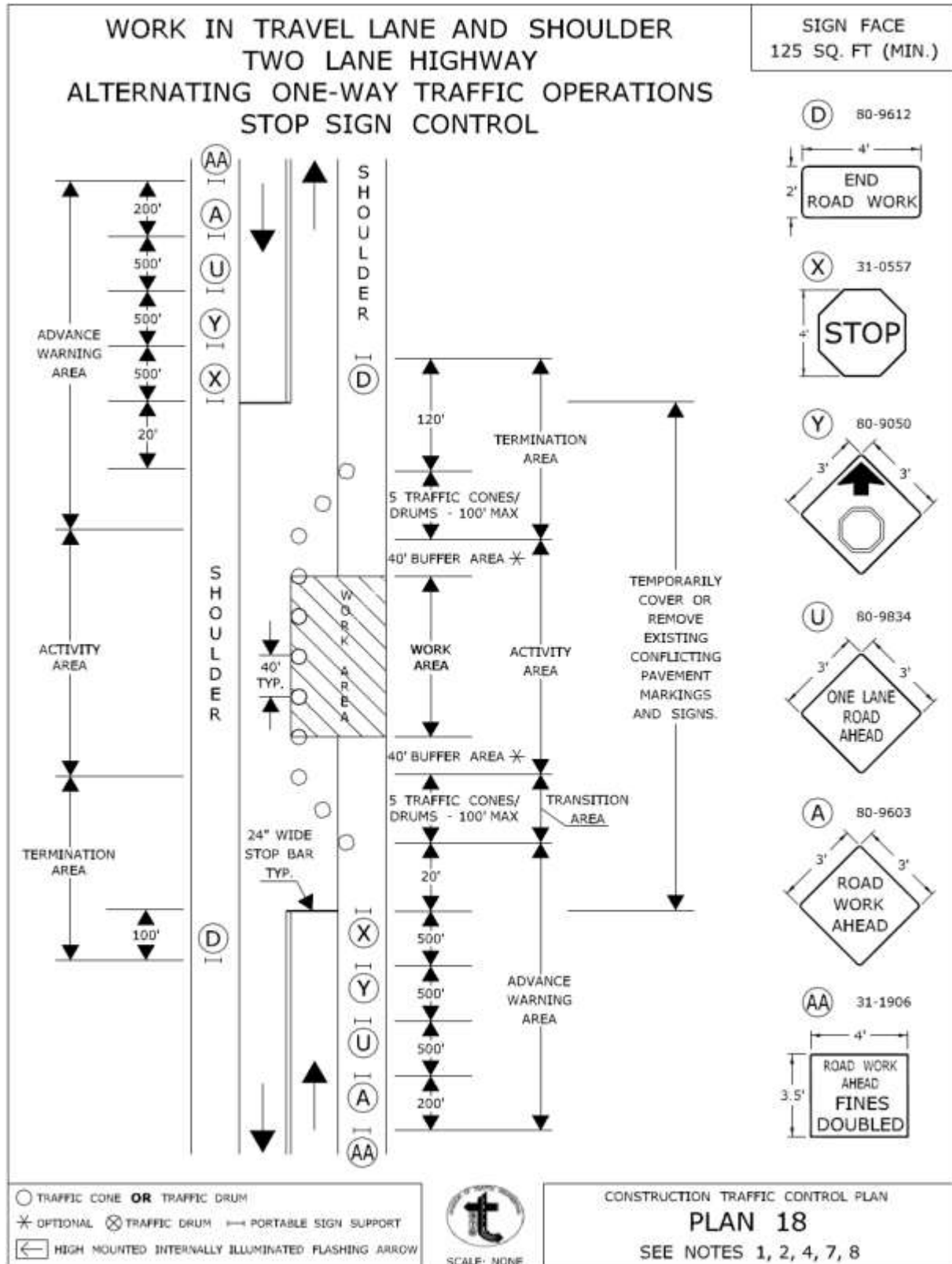
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MAINTENANCE AND PROTECTION OF TRAFFIC



MAINTENANCE AND PROTECTION OF TRAFFIC



MAINTENANCE AND PROTECTION OF TRAFFIC

MEASUREMENT AND PAYMENT

“Maintenance and Protection of Traffic” will be measured and paid for by the actual number of days traffic control devices are in use during active construction within contract time requirements. The contract unit price shall include all materials, labor, tools and equipment incidental to furnishing, maintaining and removing approved traffic control devices as shown on the Plan or as directed by the Engineer, and other pertinent work necessary to comply with this specification, including, but not limited to:

- notifying public authorities of any proposed traffic changes;
- furnishing, installing, relocating, replacing and removal of traffic cones, traffic drums, barricades, construction signs, temporary marking tape, and opposing traffic lane dividers;
- furnishing, installing, and removing the material for a temporary traversable slope in those areas where a longitudinal dropdown exists;
- furnishing, installing, and removing the material for a temporary transition where a transverse dropdown exists;
- temporarily relocating existing signs and sign supports as many times as deemed necessary and furnishing, installing, and removing temporary sign supports and foundations if necessary during construction; and
- removal or sanding of snow or ice or removal of leaves on the roadway or sidewalk if the Contractor's operations interfere with the removal or sanding of snow or ice or the removal of leaves by the public authorities or adjoining land owners in an ordinary manner with regular highway equipment.

“Maintenance and Protection of Traffic” will not be measured for payment for any days in which the Contractor performs work beyond the allotted contract time, adjusted for any change orders.

No claim for additional payment due to unusual construction conditions encountered or delay caused by the Contractor or other outside agencies shall be considered.

Pay Item

Maintenance and Protection of Traffic

Pay Unit

Days

TRAFFICPERSON (UNIFORMED POLICE OFFICERS)

DESCRIPTION

“Trafficperson (Uniformed Police Officers)” includes providing uniformed Manchester police officers for traffic control on arterial streets required by the Town of Manchester Traffic Control Ordinance (refer to associated Appendix for additional information) or when directed by the Engineer.

MATERIALS

Not applicable.

CONSTRUCTION METHODS

On designated arterial streets within the Town, the Town of Manchester Traffic Control Ordinance requires the use of Town of Manchester uniformed police officers to be used to supplement the Contractor’s traffic control operations. It is the Contractor’s responsibility to schedule, coordinate and make payment in a timely manner for the use of uniformed police officers with the Police Department. The Town of Manchester Police Department requires payment for services within fourteen (14) days of work.

MEASUREMENT AND PAYMENT

“Trafficperson (Uniformed Police Officers)” will be measured separately for payment. The Contractor will be directly reimbursed for 100% of the actual invoiced cost from the Manchester Police Department. No additional markup will be allowed. Payment will only be made when police officers were required for completion of work associated with this project on the arterial streets listed in the Town of Manchester Traffic Control Ordinance or when specifically directed by the Engineer. Uniformed police officers used on other streets, either at the choice of the Contractor or because of the Contractor’s failure to otherwise provide adequate traffic control, will not be measured for payment, but its costs shall be considered as included in the unit price bid for “Trafficperson (Uniformed Flagger)” or “Maintenance and Protection of Traffic”.

Pay Item

Trafficperson (Uniformed Police Officers)

Pay Unit

Direct

TRAFFICPERSON (UNIFORMED FLAGGERS)

DESCRIPTION

“Trafficperson (Uniformed Flaggers)” includes the furnishing of certified, uniformed flagpersons capable of safely directing traffic around the work area during all lane closures or when directed by the Engineer.

SUBMITTALS

A copy of the proposed flaggers’ training certificates shall be submitted to the Engineer prior to any Work.

MATERIALS

Not applicable. (See “Maintenance and Protection of Traffic” item)

CONSTRUCTION METHODS

Construction methods shall conform to Article 9.70.03 of Form 817.

MEASUREMENT

“Trafficperson (Uniformed Flaggers)” will be measured and paid for by the actual number of hours for each certified flagger rendering services approved by the Engineer. Services used beyond the limits approved by the Engineer or in connection with movement of construction equipment will not be measured for payment. The following will not be measured separately for payment but its cost shall be considered as included in the unit price bid for “Trafficperson (Uniformed Flaggers)”:

1. Travel time;
2. Mileage fees/Fuel surcharges;
3. Paddles;
4. Safety Equipment;

PAYMENT

Uniformed flaggers will be paid at the contract unit price per hour for “Trafficperson (Uniformed Flaggers)”, which price shall constitute all compensation, benefits, equipment and any other incidental costs associated with the furnishing of flagger services.

Pay Item

Trafficperson (Uniformed Flaggers)

Pay Unit

Hours

APPENDIX "A"

TOWN OF MANCHESTER HOLIDAY SCHEDULE

**TOWN OF MANCHESTER, CONNECTICUT
HUMAN RESOURCES DEPARTMENT**

**HOLIDAYS OBSERVED BY THE
TOWN OF MANCHESTER
2021**

Town Offices will be closed in observance of the following holidays in calendar year 2021:

NEW YEAR'S DAY	FRIDAY, JANUARY 1, 2021
MARTIN LUTHER KING DAY	MONDAY, JANUARY 18, 2021
*LINCOLN'S BIRTHDAY	
WASHINGTON'S BIRTHDAY	MONDAY, FEBRUARY 15, 2021
GOOD FRIDAY	FRIDAY, APRIL 2, 2021
MEMORIAL DAY	MONDAY, MAY 31, 2021
JUNETEENTH	FRIDAY, JUNE 18, 2021
INDEPENDENCE DAY	MONDAY, JULY 5, 2021
LABOR DAY	MONDAY, SEPTEMBER 6, 2021
COLUMBUS DAY	MONDAY, OCTOBER 11, 2021
VETERAN'S DAY	THURSDAY, NOVEMBER 11, 2021
THANKSGIVING DAY	THURSDAY, NOVEMBER 25, 2021
DAY AFTER THANKSGIVING	FRIDAY, NOVEMBER 26, 2021
*FLOATING HOLIDAY	THURSDAY, DECEMBER 23, 2021
CHRISTMAS HOLIDAY OBSERVED	FRIDAY, DECEMBER 24, 2021

***The Town, at its discretion, retains the right to substitute a floating holiday on a date of its choosing in lieu of the traditional date for celebrating Lincoln's Birthday, provided there is notification of the substitute holiday not later than December 31st for the following year.**

APPENDIX “B”

**CONSTRUCTION WORKDAY CALENDAR &
WEEKLY STATEMENT OF WORKING DAYS FORM**

2020

January						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

February						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

March						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

April						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
	206	207	208	209		
12	13	14	15	16	17	18
	210	211	212	213	214	
19	20	21	22	23	24	25
	215	216	217	218	219	
26	27	28	29	30		
	220	221	222	223		

May						
S	M	T	W	T	F	S
					1	2
					224	
3	4	5	6	7	8	9
	225	226	227	228	229	
10	11	12	13	14	15	16
	230	231	232	233	234	
17	18	19	20	21	22	23
	235	236	237	238	239	
24	25	26	27	28	29	30
31		240	241	242	243	

June						
S	M	T	W	T	F	S
	1	2	3	4	5	6
	244	245	246	247	248	
7	8	9	10	11	12	13
	249	250	251	252	253	
14	15	16	17	18	19	20
	254	255	256	257	258	
21	22	23	24	25	26	27
	259	260	261	262	263	
28	29	30				
	264	265				

July						
S	M	T	W	T	F	S
			1	2	3	4
			266	267		
5	6	7	8	9	10	11
	268	269	270	271	272	
12	13	14	15	16	17	18
	273	274	275	276	277	
19	20	21	22	23	24	25
	278	279	280	281	282	
26	27	28	29	30	31	
	283	284	285	286	287	

August						
S	M	T	W	T	F	S
2	3	4	5	6	7	1
	288	289	290	291	292	8
9	10	11	12	13	14	15
	293	294	295	296	297	
16	17	18	19	20	21	22
	298	299	300	301	302	
23	24	25	26	27	28	29
	303	304	305	306	307	
30	31					
	308					

September						
S	M	T	W	T	F	S
		1	2	3	4	5
		309	310	311	312	
6	7	8	9	10	11	12
	313	314	315	316		
13	14	15	16	17	18	19
	317	318	319	320	321	
20	21	22	23	24	25	26
	322	323	324	325	326	
27	28	29	30			
	327	328	329			

October						
S	M	T	W	T	F	S
				1	2	3
				330	331	
4	5	6	7	8	9	10
	332	333	334	335	336	
11	12	13	14	15	16	17
	337	338	339	340		
18	19	20	21	22	23	24
	341	342	343	344	345	
25	26	27	28	29	30	31
	346	347	348	349	350	

November						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
	351	352	353	354	355	
8	9	10	11	12	13	14
	356	357		358	359	
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

December						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

2021

January						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

February						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

March						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

April						
S	M	T	W	T	F	S
				1	2	3
				360		
4	5	6	7	8	9	10
	361	362	363	364	365	
11	12	13	14	15	16	17
	366	367	368	369	370	
18	19	20	21	22	23	24
	371	372	373	374	375	
25	26	27	28	29	30	
	376	377	378	379	380	

May						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
	381	382	383	384	385	
9	10	11	12	13	14	15
	386	387	388	389	390	
16	17	18	19	20	21	22
	391	392	393	394	395	
23	24	25	26	27	28	29
	396	397	398	399	400	

June						
S	M	T	W	T	F	S
30	31	1	2	3	4	5
		401	402	403	404	
6	7	8	9	10	11	12
	405	406	407	408	409	
13	14	15	16	17	18	19
	410	411	412	413	414	
20	21	22	23	24	25	26
	415	416	417	418	419	
27	28	29	30			
	420	421	422			

July						
S	M	T	W	T	F	S
				1	2	3
				423	424	
4	5	6	7	8	9	10
	425	426	427	428		
11	12	13	14	15	16	17
	429	430	431	432	433	
18	19	20	21	22	23	24
	434	435	436	437	438	
25	26	27	28	29	30	31
	439	440	441	442	443	

August						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
	444	445	446	447	448	
8	9	10	11	12	13	14
	449	450	451	452	453	
15	16	17	18	19	20	21
	454	455	456	457	458	
22	23	24	25	26	27	28
	459	460	461	462	463	
29	30	31				
	464	465				

September						
S	M	T	W	T	F	S
			466	467</		

TOWN OF MANCHESTER ENGINEERING DIVISION WEEKLY STATEMENT OF WORKING DAYS

CONTRACTOR:

WEEK ENDING:

ABC CONSTRUCTION Co.

5/31/2013

PROJECT:

PROJECT NO.:

RECONSTRUCTION OF ANY STREET

2013100

Date	Day	Weather, Weather Conditions or Other Conditions	Working Day	Non-Working Day	Working Day No Work Done
5/27/2013	Monday	HOLIDAY			
5/28/2013	Tuesday	Sunny	X		
5/29/2013	Wednesday	Sunny	X		
5/30/2013	Thursday	Rain		X	
5/31/2013	Friday	Sunny	X		
Days This Week:			3	1	0
Days Previously Reported:			26	5	8
Total Days to Date:			29	6	8

Time Extension Days Granted This Week:

Reason:

Computation of Extended Date for Completion

1. First Working Day
2. Working Days Specified in Contract
3. Computed Date for Completion (Line 1 + Line 2)
4. Total Time Extensions Approved to Date
5. Total Non-Working Days to Date
6. Subtotal (Line 4 + Line 5)
7. Extended Date for Completion
8. Revised Working Days for Contract (Line 2 + Line 6)
9. Total Working Days to Date
10. Working Days Remaining (Line 8 - Line 9)

Number of Days	Numbered Day	Date
	10	4/1/2013
60		
	70	6/25/2013
4		
6		
10		
	80	7/10/2013
70		
29		
41		

CONTROLLING OPERATIONS:

Installation of drainage pipe and associated structures from Sta 0+00 to 2+00.

REMARKS:

The Contractor will be allowed fifteen (15) days in which to protest in writing the correctness of the statement; otherwise the statement shall be deemed to have been accepted by the contractor as correct.

CONTRACTOR'S SIGNATURE:

DATE:

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TOWN OF MANCHESTER ENGINEERING DIVISION WEEKLY STATEMENT OF WORKING DAYS

CONTRACTOR:

WEEK ENDING:

--	--

PROJECT:

PROJECT NO.:

--	--

Date	Day	Weather, Weather Conditions or Other Conditions	Working Day	Non-Working Day	Working Day No Work Done
	Monday				
	Tuesday				
	Wednesday				
	Thursday				
	Friday				
Days This Week:					
Days Previously Reported:					
Total Days to Date:					

Time Extension Days Granted This Week:	
Reason:	

Computation of Extended Date for Completion	Number of Days	Numbered Day	Date
1. First Working Day			
2. Working Days Specified in Contract			
3. Computed Date for Completion (Line 1 + Line 2)			
4. Total Time Extensions Approved to Date			
5. Total Non-Working Days to Date			
6. Subtotal (Line 4 + Line 5)			
7. Extended Date for Completion			
8. Revised Working Days for Contract (Line 2 + Line 6)			
9. Total Working Days to Date			
10. Working Days Remaining (Line 8 - Line 9)			

CONTROLLING OPERATIONS:

--

REMARKS:

--

The Contractor will be allowed fifteen (15) days in which to protest in writing the correctness of the statement; otherwise the statement shall be deemed to have been accepted by the contractor as correct.

CONTRACTOR'S SIGNATURE:

DATE:

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APPENDIX “C”

TOWN OF MANCHESTER TRAFFIC CONTROL ORDINANCE

Chapter 279. Streets and Sidewalks

Article II. Traffic Control at Construction Activity

[Adopted 11-18-1997 (Sec. 14-14 of the 1996 Code)]

§ 279-14. Barricades and other protection at repair work sites.

When any excavation, construction or repair of or on any public roadway, street (excluding limited access highways, adjoining ramps and state/federal roads) or sidewalk or the destruction of any building within the Town of Manchester (hereinafter referred to as "repair work") creates or may create a hazard or inconvenience to vehicular or pedestrian traffic or in any way causes or may cause a hazard to the public safety, as determined by the Chief of Police or his designee, the person so engaged in any repair work must provide adequate protection, as the Chief of Police or his designee may require. If the Chief of Police or his designee determines that the site may be adequately protected by placement of appropriate barricades, the person engaged in any such repair work shall provide such barricades and barricade warning lights as the Chief of Police or his designee shall require.

§ 279-15. Use of municipal flagpersons.

A. If the Chief of Police or his designee, in his sole discretion, determines that the public safety requires the use of a flagperson, and the repair work takes place during normal business hours of 7:00 a.m. to 6:00 p.m., Monday through Saturday; and affects one or more of the following Town principal or minor arterial roads, and the repair work is not de minimis in nature, the Chief of Police shall require that the person engaged in the repair work first utilize officers of the Manchester Police Department as flagpersons.

(1) Principal arterials.

(a) Route 83 (Main Street) — Charter Oak Street to Center Street.

(b) Buckland Street — Tolland Turnpike to South Windsor Town line.

(2) Minor arterials.

(a) Broad Street.

(b) West and East Middle Turnpike — New State Road to Woodbridge Street.

(c) North Main Street — Main Street to Tolland Turnpike.

- (d) New State Road — West Middle Turnpike to Adam Street.
- (e) Tolland Turnpike — North Main Street to East Hartford Town line.
- (f) Adams Street — Center Street to Tolland Turnpike.
- (g) Keeney Street — Hartford Road to Glastonbury Town line.
- (h) McKee Street.
- (i) Woodbridge Street — East Middle Turnpike to Route 83 (Main Street).
- (j) Buckland Hills Drive.
- (k) Slater Street.
- (l) Hale Road.
- (m) Parker Street — Tolland Turnpike to Colonial Road.
- (n) Pine Street.
- (o) Summit Street.
- (p) Pavilions Drive.

- B. The expense of such police protection shall be paid by the entity engaged in such repair work at rates determined by the Town.
- C. Notwithstanding any other provision of this article, any repair work performed by the municipality or any of its offices or agents, or initiated by the municipality or any of its offices or agents and performed by a private contractor, regardless of location, may at the Chief of Police or his designee's discretion utilize properly equipped and trained municipal employees or agents of the municipality as flagpersons. In addition, the Chief of Police or his designee may in his sole discretion recommend to contractors working on state or federal roads that they utilize officers of the Manchester Police Department if a flagperson is needed for public safety.

§ 279-16. Use of nonmunicipal flagpersons.

If no police officer of the Manchester Police Department is available to accept the extra police duty referenced herein, and the repair work is conducive to the use of flagpersons as determined by the Chief of Police or his designee, or in any other instance when flagpersons are utilized, the entity responsible for the repair work shall provide, pay for and utilize a flagperson equipped with a high visibility traffic control vest and high visibility traffic control flag whose sole function shall be to control vehicular and pedestrian traffic during all hours when repair work is being done or when a hazard to such traffic or to public safety exists.

§ 279-17. Authority to close repair work if no flagperson is provided.

When such police officer or flagperson has not been provided and the Chief of Police or his designee determines that a hazard to pedestrian and/or vehicular traffic exists, the Chief of Police or his designee may order the repair work closed until a flagperson has been provided in accordance with §§ **279-14** through **279-17** of this article, or other appropriate action is taken as ordered by the Chief of Police or his designee.

§ 279-18. Authority of Traffic Control Authority during emergencies.

Nothing herein shall prevent the Traffic Control Authority from taking any and all necessary action in the time of emergency.

APPENDIX “D”
PAVEMENT CORE RESULTS

PAVEMENT CORE RESULTS

STREET	CORE #	HOUSE #	DEPTH (in)
SPRUCE STREET	123	28	4
SPRUCE STREET	124	60	4
SPRUCE STREET	125	92	4
SPRUCE STREET	126	119	4
SPRUCE STREET	127	153	4
FOSTER STREET	133	19	3.5
FOSTER STREET	134	35	2
FOSTER STREET	135	57	2
MADISON STREET	136	20	2
MADISON STREET	137	34	3
MADISON STREET	138	41	2
HAWLEY STREET	139	100' FROM INTER	4
HAWLEY STREET	140	200' FROM INTER	4

APPENDIX “E”

STATE OF CONNECTICUT PREVAILING WAGE RATES

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.

Informational Bulletin

THE 10-HOUR OSHA CONSTRUCTION SAFETY AND HEALTH COURSE

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

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

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

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

November 29, 2006

Notice
To All Mason Contractors and Interested Parties
Regarding Construction Pursuant to Section 31-53 of the
Connecticut General Statutes (Prevailing Wage)

The Connecticut Labor Department Wage and Workplace Standards Division is empowered to enforce the prevailing wage rates on projects covered by the above referenced statute.

Over the past few years the Division has withheld enforcement of the rate in effect for workers who operate a forklift on a prevailing wage rate project due to a potential jurisdictional dispute.

The rate listed in the schedules and in our Occupational Bulletin (see enclosed) has been as follows:

Forklift Operator:

- **Laborers (Group 4) Mason Tenders** - operates forklift solely to assist a mason to a maximum height of nine feet only.
- **Power Equipment Operator (Group 9)** - operates forklift to assist any trade and to assist a mason to a height over nine feet.

The U.S. Labor Department conducted a survey of rates in Connecticut but it has not been published and the rate in effect remains as outlined in the above Occupational Bulletin.

Since this is a classification matter and not one of jurisdiction, effective January 1, 2007 the Connecticut Labor Department will enforce the rate on each schedule in accordance with our statutory authority.

Your cooperation in filing appropriate and accurate certified payrolls is appreciated.

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.

***FRINGE BENEFITS EXPLANATION (P):**

Bona fide benefits paid to approved plans, funds or programs, except those required by Federal or State Law (unemployment tax, worker’s compensation, income taxes, etc.).

Please specify the type of benefits provided:

- 1) Medical or hospital care _____ 4) Disability _____
- 2) Pension or retirement _____ 5) Vacation, holiday _____
- 3) Life Insurance _____ 6) Other (please specify) _____

CERTIFIED STATEMENT OF COMPLIANCE

For the week ending date of _____,

I, _____ of _____, (hereafter known as Employer) in my capacity as _____ (title) do hereby certify and state:

Section A:

1. All persons employed on said project have been paid the full weekly wages earned by them during the week in accordance with Connecticut General Statutes, section 31-53, as amended. Further, I hereby certify and state the following:

- a) The records submitted are true and accurate;
- b) The rate of wages paid to each mechanic, laborer or workman and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as defined in Connecticut General Statutes, section 31-53 (h), are not less than the prevailing rate of wages and the amount of payment or contributions paid or payable on behalf of each such person to any employee welfare fund, as determined by the Labor Commissioner pursuant to subsection Connecticut General Statutes, section 31-53 (d), and said wages and benefits are not less than those which may also be required by contract;
- c) The Employer has complied with all of the provisions in Connecticut General Statutes, section 31-53 (and Section 31-54 if applicable for state highway construction);
- d) Each such person is covered by a worker’s compensation insurance policy for the duration of his employment which proof of coverage has been provided to the contracting agency;
- e) The Employer does not receive kickbacks, which means any money, fee, commission, credit, gift, gratuity, thing of value, or compensation of any kind which is provided directly or indirectly, to any prime contractor, prime contractor employee, subcontractor, or subcontractor employee for the purpose of improperly obtaining or rewarding favorable treatment in connection with a prime contract or in connection with a prime contractor in connection with a subcontractor relating to a prime contractor; and
- f) The Employer is aware that filing a certified payroll which he knows to be false is a class D felony for which the employer may be fined up to five thousand dollars, imprisoned for up to five years or both.

2. OSHA~The employer shall affix a copy of the construction safety course, program or training completion document to the certified payroll required to be submitted to the contracting agency for this project on which such persons name first appears.

_____ (Signature) _____ (Title) _____ Submitted on (Date)

Information Bulletin ***Occupational Classifications***

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

Note: This information is intended to provide a sample of some occupational classifications for guidance purposes only. It is not an all-inclusive list of each occupation's duties. This list is being provided only to highlight some areas where a contractor may be unclear regarding the proper classification. If unsure, the employer should seek guidelines for CTDOL.

Below are additional clarifications of specific job duties performed for certain classifications:

- **ASBESTOS WORKERS**

Applies all insulating materials, protective coverings, coatings and finishes to all types of mechanical systems.

- **ASBESTOS INSULATOR**

Handle, install apply, fabricate, distribute, prepare, alter, repair, dismantle, heat and frost insulation, including penetration and fire stopping work on all penetration fire stop systems.

- **BOILERMAKERS**

Erects hydro plants, incomplete vessels, steel stacks, storage tanks for water, fuel, etc. Builds incomplete boilers, repairs heat exchanges and steam generators.

- **BRICKLAYERS, CEMENT MASONS, CEMENT FINISHERS, MARBLE MASONS, PLASTERERS, STONE MASONS, PLASTERERS. STONE MASONS, TERRAZZO WORKERS, TILE SETTERS**

Lays building materials such as brick, structural tile and concrete cinder, glass, gypsum, terra cotta block. Cuts, tools and sets marble, sets stone, finishes concrete, applies decorative steel, aluminum and plastic tile, applies cements, sand, pigment and marble chips to floors, stairways, etc.

- **CARPENTERS, MILLWRIGHTS. PILEDRIVERMEN. LATHERS. RESILEINT FLOOR LAYERS, DOCK BUILDERS, DIKERS, DIVER TENDERS**

Constructs, erects, installs and repairs structures and fixtures of wood, plywood and wallboard. Installs, assembles, dismantles, moves industrial machinery. Drives piling into ground to provide foundations for structures such as buildings and bridges, retaining walls for earth embankments, such as cofferdams. Fastens wooden, metal or rockboard lath to walls, ceilings and partitions of buildings, acoustical tile layer, concrete form builder. Applies firestopping materials on fire resistive joint systems only. Installation of curtain/window walls only where attached to wood or metal studs. Installation of insulated material of all types whether blown, nailed or attached in other ways to walls, ceilings and floors of buildings. Assembly and installation of modular furniture/furniture systems. Free-standing furniture is not covered. This includes free standing: student chairs, study top desks, book box desks, computer furniture, dictionary stand, atlas stand, wood shelving, two-position information access station, file cabinets, storage cabinets, tables, etc.

- **LABORER, CLEANING**

- The clean up of any construction debris and the general (heavy/light) cleaning, including sweeping, wash down, mopping, wiping of the construction facility and its furniture, washing, polishing, and dusting.

- **DELIVERY PERSONNEL**

- If delivery of supplies/building materials is to one common point and stockpiled there, prevailing wages are not required. If the delivery personnel are involved in the distribution of the material to multiple locations within the construction site then they would have to be paid prevailing wages for the type of work performed: laborer, equipment operator, electrician, ironworker, plumber, etc.

- An example of this would be where delivery of drywall is made to a building and the delivery personnel distribute the drywall from one "stockpile" location to further sub-locations on each floor. Distribution of material around a construction site is the job of a laborer or tradesman, and not a delivery personnel.

- **ELECTRICIANS**

Install, erect, maintenance, alteration or repair of any wire, cable, conduit, etc., which generates, transforms, transmits or uses electrical energy for light, heat, power or other purposes, including the Installation or maintenance of telecommunication, LAN wiring or computer equipment, and low voltage wiring. ****License required per Connecticut General Statutes: E-1,2 L-5,6 C-5,6 T-1,2 L-1,2 V-1,2,7,8,9.***

- **ELEVATOR CONSTRUCTORS**

Install, erect, maintenance and repair of all types of elevators, escalators, dumb waiters and moving walks. **License required by Connecticut General Statutes: R-1,2,5,6.*

- **FORK LIFT OPERATOR**

Laborers Group 4) Mason Tenders - operates forklift solely to assist a mason to a maximum height of nine (9) feet only.

Power Equipment Operator Group 9 - operates forklift to assist any trade, and to assist a mason to a height over nine (9) feet.

- **GLAZIERS**

Glazing wood and metal sash, doors, partitions, and 2 story aluminum storefronts. Installs glass windows, skylights, store fronts and display cases or surfaces such as building fronts, interior walls, ceilings and table tops and metal store fronts. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers, which require equal composite workforce.

- **IRONWORKERS**

Erection, installation and placement of structural steel, precast concrete, miscellaneous iron, ornamental iron, metal curtain wall, rigging and reinforcing steel. Handling, sorting, and installation of reinforcing steel (rebar). Metal bridge rail (traffic), metal bridge handrail, and decorative security fence installation. Installation of aluminum window walls and curtain walls is the "joint" work of glaziers and ironworkers which require equal composite workforce.

- **INSULATOR**

- Installing fire stopping systems/materials for "Penetration Firestop Systems": transit to cables, electrical conduits, insulated pipes, sprinkler pipe penetrations, ductwork behind radiation, electrical cable trays, fire rated pipe penetrations, natural polypropylene, HVAC ducts, plumbing bare metal, telephone and communication wires, and boiler room ceilings.

- **LABORERS**

Acetylene burners, asphalt rakers, chain saw operators, concrete and power buggy operator, concrete saw operator, fence and guard rail erector (except metal bridge rail (traffic), decorative security fence (non-metal)).

installation.), hand operated concrete vibrator operator, mason tenders, pipelayers (installation of storm drainage or sewage lines on the street only), pneumatic drill operator, pneumatic gas and electric drill operator, powermen and wagon drill operator, air track operator, block paver, curb setters, blasters, concrete spreaders.

- **PAINTERS**

Maintenance, preparation, cleaning, blasting (water and sand, etc.), painting or application of any protective coatings of every description on all bridges and appurtenances of highways, roadways, and railroads. Painting, decorating, hardwood finishing, paper hanging, sign writing, scenic art work and drywall hhg for any and all types of building and residential work.

- **LEAD PAINT REMOVAL**

- Painter's Rate

1. Removal of lead paint from bridges.
2. Removal of lead paint as preparation of any surface to be repainted.
3. Where removal is on a Demolition project prior to reconstruction.

- Laborer's Rate

1. Removal of lead paint from any surface NOT to be repainted.
2. Where removal is on a *TOTAL* Demolition project only.

- **PLUMBERS AND PIPEFITTERS**

Installation, repair, replacement, alteration or maintenance of all plumbing, heating, cooling and piping. ****License required per Connecticut General Statutes: P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2 S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4.***

- **POWER EQUIPMENT OPERATORS**

Operates several types of power construction equipment such as compressors, pumps, hoists, derricks, cranes, shovels, tractors, scrapers or motor graders, etc. Repairs and maintains equipment. ****License required, crane operators only, per Connecticut General Statutes.***

- **ROOFERS**

Covers roofs with composition shingles or sheets, wood shingles, slate or asphalt and gravel to waterproof roofs, including preparation of surface. (demolition or removal of any type of roofing and or clean-up of any and all areas where a roof is to be relaid.)

- **SHEETMETAL WORKERS**

Fabricate, assembles, installs and repairs sheetmetal products and equipment in such areas as ventilation, air-conditioning, warm air heating, restaurant equipment, architectural sheet metal work, sheetmetal roofing, and aluminum gutters. Fabrication, handling, assembling, erecting, altering, repairing, etc. of coated metal material panels and composite metal material panels when used on building exteriors and interiors as soffits, fascia, louvers, partitions, canopies, cornice, column covers, awnings, beam covers, cladding, sun shades, lighting troughs, spires, ornamental roofing, metal ceilings, mansards, copings, ornamental and ventilation hoods, vertical and horizontal siding panels, trim, etc. The sheet metal classification also applies to the vast variety of coated metal material panels and composite metal material panels that have evolved over the years as an alternative to conventional ferrous and non-ferrous metals like steel, iron, tin, copper, brass, bronze, aluminum, etc. Fabrication, handling, assembling, erecting, altering, repairing, etc. of architectural metal roof, standing seam roof, composite metal roof, metal and composite bathroom/toilet partitions, aluminum gutters, metal and composite lockers and shelving, kitchen equipment, and walk-in coolers. To include testing and air –balancing ancillary to installation and construction.

- **SPRINKLER FITTERS**

Installation, alteration, maintenance and repair of fire protection sprinkler systems.

****License required per Connecticut General Statutes: F-1,2,3,4.***

- **TILE MARBLE AND TERRAZZO FINISHERS**

Assists and tends the tile setter, marble mason and terrazzo worker in the performance of their duties.

- **TRUCK DRIVERS**

~How to pay truck drivers delivering asphalt is under REVISION~

Truck Drivers are requires to be paid prevailing wage for time spent "working" directly on the site. These drivers remain covered by the prevailing wage for any time spent transporting between the actual construction location and facilities (such as fabrication, plants, mobile factories, batch plant, borrow pits, job headquarters, tool yards, etc.) dedicated exclusively, or nearly so, to performance of the contract or project, which are so located in proximity to the actual construction location that it is reasonable to include them. ****License required, drivers only, per Connecticut General Statutes.***

For example:

- Material men and deliverymen are not covered under prevailing wage as long as they are not directly involved in the construction process. If, they unload the material, they would then be covered by prevailing wage for the classification they are performing work in: laborer, equipment operator, etc.
- Hauling material off site is not covered provided they are not dumping it at a location outlined above.
- Driving a truck on site and moving equipment or materials on site would be considered covered work, as this is part of the construction process.

➤ *Any questions regarding the proper classification should be directed to:*
Public Contract Compliance Unit
Wage and Workplace Standards Division
Connecticut Department of Labor
200 Folly Brook Blvd, Wethersfield, CT 06109
(860) 263-6543.

**Connecticut Department of Labor
Wage and Workplace Standards Division
FOOTNOTES**

⇒ Please Note: If the “Benefits” listed on the schedule for the following occupations includes a letter(s) (+ a or + a+b for instance), refer to the information below.

Benefits to be paid at the appropriate prevailing wage rate for the listed occupation.

If the “Benefits” section for the occupation lists only a dollar amount, disregard the information below.

Bricklayers, Cement Masons, Cement Finishers, Concrete Finishers, Stone Masons
(Building Construction) and
(Residential- Hartford, Middlesex, New Haven, New London and Tolland Counties)

- a. Paid Holiday: Employees shall receive 4 hours for Christmas Eve holiday provided the employee works the regularly scheduled day before and after the holiday. Employers may schedule work on Christmas Eve and employees shall receive pay for actual hours worked in addition to holiday pay.

Elevator Constructors: Mechanics

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

Glaziers

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

Power Equipment Operators
(Heavy and Highway Construction & Building Construction)

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

Ironworkers

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

Laborers (Tunnel Construction)

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

Roofers

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

Sprinkler Fitters

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

Truck Drivers

(Heavy and Highway Construction & Building Construction)

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

Important Information:

For use with Building, Heavy/Highway, and Residential

Welders: Rate for craft to which welding is incidental.

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

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

ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra \$4.00 premium in addition to the hourly wage rate and benefit contributions:

- 1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)
- 2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson
- 3) Cranes (under 100 ton rated capacity)

Crane with boom including jib, 150 feet - \$1.50 extra.

Crane with boom including jib, 200 feet - \$2.50 extra.

Crane with boom including jib, 250 feet - \$5.00 extra.

Crane with boom including jib, 300 feet - \$7.00 extra.

Crane with boom including jib, 400 feet - \$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 one 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.ctdol.state.ct.us.
- 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.

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 Persons 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.

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

ID#: 21-19822

**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: Manchester

Project Town: Manchester

State#: Manchester

FAP#: Manchester

Project: Improvements to the Foster Street Neighborhood (Manchester)

CLASSIFICATION	Hourly Rate	Benefits
1) Boilermaker	33.79	34% + 8.96
1a) Bricklayer, Cement Masons, Cement Finishers, Plasterers, Stone Masons	35.72	33.16
2) Carpenters, Piledrivermen	34.53	25.64
2a) Diver Tenders	34.53	25.64
3) Divers	42.99	25.64
03a) Millwrights	34.94	26.19
4) Painters: (Bridge Construction) Brush, Roller, Blasting (Sand, Water, etc.), Spray	52.25	22.55
4a) Painters: Brush and Roller	35.62	22.55
4b) Painters: Spray Only	38.62	22.55
4c) Painters: Steel Only	37.62	22.55
4d) Painters: Blast and Spray	38.62	22.55
4e) Painters: Tanks, Tower and Swing	37.62	22.55

Project: Improvements to the Foster Street Neighborhood (Manchester)

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)	40.25	29.17+3% of gross wage
6) Ironworkers: Ornamental, Reinforcing, Structural, and Precast Concrete Erection	36.67	37.62 + a
7) Plumbers (Trade License required: (P-1,2,6,7,8,9 J-1,2,3,4 SP-1,2) and Pipefitters (Including HVAC Work) (Trade License required: S-1,2,3,4,5,6,7,8 B-1,2,3,4 D-1,2,3,4 G-1, G-2, G-8, G-9)	44.63	32.95
----LABORERS-----		
8) Group 1: Laborer (Unskilled), Common or General, acetylene burner, concrete specialist	31.0	22.15
9) Group 2: Chain saw operators, fence and guard rail erectors, pneumatic tool operators, powdermen	31.25	22.15
10) Group 3: Pipelayers	31.5	22.15
11) Group 4: Jackhammer/Pavement breaker (handheld); mason tenders (cement/concrete), catch basin builders, asphalt rakers, air track operators, block paver, curb setter and forklift operators	31.5	22.15
12) Group 5: Toxic waste removal (non-mechanical systems)	33.0	22.15
13) Group 6: Blasters	32.75	22.15
Group 7: Asbestos/lead removal, non-mechanical systems (does not include leaded joint pipe)	32.0	22.15
Group 8: Traffic control signalmen	18.0	22.15
Group 9: Hydraulic Drills	29.3	18.90
----LABORERS (TUNNEL CONSTRUCTION, FREE AIR). Shield Drive and Liner Plate Tunnels in Free Air.----		
13a) Miners, Motormen, Mucking Machine Operators, Nozzle Men, Grout Men, Shaft & Tunnel Steel & Rodmen, Shield & Erector, Arm Operator, Cable Tenders	33.23	22.15 + a
13b) Brakemen, Trackmen	32.26	22.15 + a
----CLEANING, CONCRETE AND CAULKING TUNNEL----		

Project: Improvements to the Foster Street Neighborhood (Manchester)

14) Concrete Workers, Form Movers, and Strippers	32.26	22.15 + a
15) Form Erectors	32.59	22.15 + a
----ROCK SHAFT LINING, CONCRETE, LINING OF SAME AND TUNNEL IN FREE AIR:----		
16) Brakemen, Trackmen, Tunnel Laborers, Shaft Laborers	32.26	22.15 + a
17) Laborers Topside, Cage Tenders, Bellman	32.15	22.15 + a
18) Miners	33.23	22.15 + a
----TUNNELS, CAISSON AND CYLINDER WORK IN COMPRESSED AIR: ----		
18a) Blaster	39.72	22.15 + a
19) Brakemen, Trackmen, Groutman, Laborers, Outside Lock Tender, Gauge Tenders	39.52	22.15 + a
20) Change House Attendants, Powder Watchmen, Top on Iron Bolts	37.54	22.15 + a
21) Mucking Machine Operator	40.31	22.15 + a
----TRUCK DRIVERS----(*see note below)		
Two axle trucks	29.86	25.79 + a
Three axle trucks; two axle ready mix	29.97	25.79 + a
Three axle ready mix	30.03	25.79 + a
Four axle trucks, heavy duty trailer (up to 40 tons)	30.08	25.79 + a
Four axle ready-mix	30.13	25.79 + a
Heavy duty trailer (40 tons and over)	30.35	25.79 + a

As of: February 11, 2021

Project: Improvements to the Foster Street Neighborhood (Manchester)

Specialized earth moving equipment other than conventional type on-the road trucks and semi-trailer (including Euclids)	30.13	25.79 + a
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----POWER EQUIPMENT OPERATORS----

Group 1: Crane handling or erecting structural steel or stone, hoisting engineer (2 drums or over), front end loader (7 cubic yards or over), Work Boat 26 ft. & Over, Tunnel Boring Machines. (Trade License Required)	42.45	25.30 + a
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Group 2: Cranes (100 ton rate capacity and over); Excavator over 2 cubic yards; Piledriver (\$3.00 premium when operator controls hammer); Bauer Drill/Caisson. (Trade License Required)	42.11	25.30 + a
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Group 3: Excavator/Backhoe under 2 cubic yards; Cranes (under 100 ton rated capacity), Gradall; Master Mechanic; Hoisting Engineer (all types of equipment where a drum and cable are used to hoist or drag material regardless of motive power of operation), Rubber Tire Excavator (Drott-1085 or similar); Grader Operator; Bulldozer Fine Grade (slopes, shaping, laser or GPS, etc.). (Trade License Required)	41.32	25.30 + a
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Group 4: Trenching Machines; Lighter Derrick; Concrete Finishing Machine; CMI Machine or Similar; Koehring Loader (Skooper)	40.91	25.30 + a
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Group 5: Specialty Railroad Equipment; Asphalt Paver; Asphalt Spreader; Asphalt Reclaiming Machine; Line Grinder; Concrete Pumps; Drills with Self Contained Power Units; Boring Machine; Post Hole Digger; Auger; Pounder; Well Digger; Milling Machine (over 24	40.28	25.30 + a
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Group 5 continued: Side Boom; Combination Hoe and Loader; Directional Driller.	40.28	25.30 + a
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Group 6: Front End Loader (3 up to 7 cubic yards); Bulldozer (rough grade dozer).	39.95	25.30 + a
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Group 7: Asphalt Roller; Concrete Saws and Cutters (ride on types); Vermeer Concrete Cutter; Stump Grinder; Scraper; Snooper; Skidder; Milling Machine (24	39.59	25.30 + a
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Group 8: Mechanic, Grease Truck Operator, Hydroblaster, Barrier Mover, Power Stone Spreader; Welder; Work Boat under 26 ft.; Transfer Machine.	39.17	25.30 + a
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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).	38.71	25.30 + a
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Group 10: Vibratory Hammer, Ice Machine, Diesel and Air Hammer, etc.	36.54	25.30 + a
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Group 11: Conveyor, Earth Roller; Power Pavement Breaker (whiphammer), Robot Demolition Equipment.	36.54	25.30 + a
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Group 12: Wellpoint Operator.	36.48	25.30 + a
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As of: February 11, 2021

Project: Improvements to the Foster Street Neighborhood (Manchester)

Group 13: Compressor Battery Operator.	35.86	25.30 + a
Group 14: Elevator Operator; Tow Motor Operator (Solid Tire No Rough Terrain).	34.66	25.30 + a
Group 15: Generator Operator; Compressor Operator; Pump Operator; Welding Machine Operator; Heater Operator.	34.23	25.30 + a
Group 16: Maintenance Engineer/Oiler	33.54	25.30 + a
Group 17: Portable asphalt plant operator; portable crusher plant operator; portable concrete plant operator.	38.11	25.30 + a
Group 18: Power Safety Boat; Vacuum Truck; Zim Mixer; Sweeper; (minimum for any job requiring CDL license).	35.53	25.30 + a
**NOTE: SEE BELOW		
----LINE CONSTRUCTION----(Railroad Construction and Maintenance)---		
-		
20) Lineman, Cable Splicer, Technician	48.19	6.5% + 22.00
21) Heavy Equipment Operator	42.26	6.5% + 19.88
22) Equipment Operator, Tractor Trailer Driver, Material Men	40.96	6.5% + 19.21
23) Driver Groundmen	26.5	6.5% + 9.00
23a) Truck Driver	40.96	6.5% + 17.76
----LINE CONSTRUCTION----		
24) Driver Groundmen	30.92	6.5% + 9.70
25) Groundmen	22.67	6.5% + 6.20
26) Heavy Equipment Operators	37.1	6.5% + 10.70
27) Linemen, Cable Splicers, Dynamite Men	41.22	6.5% + 12.20

As of: February 11, 2021

Project: Improvements to the Foster Street Neighborhood (Manchester)

28) Material Men, Tractor Trailer Drivers, Equipment Operators

35.04

6.5% + 10.45

Project: Improvements to the Foster Street Neighborhood (Manchester)

Welders: Rate for craft to which welding is incidental.

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

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

ALL Cranes: When crane operator is operating equipment that requires a fully licensed crane operator to operate he receives an extra \$4.00 premium in addition to the hourly wage rate and benefit contributions:

- 1) Crane handling or erecting structural steel or stone; hoisting engineer (2 drums or over)**
- 2) Cranes (100 ton rate capacity and over) Bauer Drill/Caisson**
- 3) Cranes (under 100 ton rated capacity)**

Crane with 150 ft. boom (including jib) - \$1.50 extra

Crane with 200 ft. boom (including jib) - \$2.50 extra

Crane with 250 ft. boom (including jib) - \$5.00 extra

Crane with 300 ft. boom (including jib) - \$7.00 extra

Crane with 400 ft. boom (including jib) - \$10.00 extra

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

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

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

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

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

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

The annual adjustments will be posted on the Department of Labor's Web page: www.ct.gov/dol. For those without internet access, please contact the division listed below.

The Department of Labor will continue to issue the initial prevailing wage rate schedule to the Contracting Agency for the project.

All subsequent annual adjustments will be posted on our Web Site for contractor access.

Contracting Agencies are under no obligation pursuant to State labor law to pay any increase due to the annual adjustment provision.

Effective October 1, 2005 - Public Act 05-50: any person performing the work of any mechanic, laborer, or worker shall be paid prevailing wage

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.

As of: February 11, 2021

Project: Improvements to the Foster Street Neighborhood (Manchester)

~~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: February 11, 2021