

Solicitation for:
Year 11 – Water Systems Improvements
IFB 20-07
City of Woburn, Massachusetts

Posted: February 27, 2020
Due: March 12, 2020 11:00AM EST
ODELUCA@CITYOFWOBURN.COM

Deliver to:
City of Woburn
Purchasing Department
ATTN: Orazio DeLuca, MCPPO
Chief Procurement Officer
odeluca@cityofwoburn.com
10 Common Street
Woburn, MA 01801



Section 00010
WOBURN, MASSACHUSETTS
WATER SYSTEM IMPROVEMENTS Year 11
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Section 00020
Invitation to Bid
City of Woburn, Massachusetts
Water System Improvements, Year 11
IFB 20-07

Sealed bids for “City of Woburn Massachusetts, **“Water System Improvements, Year 11”**, **IFB 20-07** will be accepted by the **Department of Public Works** acting through the **Purchasing Agent**. **Sealed bids** will be accepted at the Office of the Purchasing Agent, City Hall, 10 Common Street, Woburn, Massachusetts 01801, until **11:00 AM on March 12, 2020** and at that time the bids shall be publicly opened and read aloud.

The proposed work includes furnishing all labor, tools and equipment necessary to: **clean and cement line approximately three thousand nine hundred (3,900) feet of 6 inch cast iron water main; furnish and install two thousand two hundred (2,200) feet of 8 inch ductile iron pipe; furnish and install eight hundred and fifty (850) feet of 16 inch ductile iron pipe; including furnishing and installing all valves, hydrants, fittings, couplings, temporary water and pavement as necessary to complete the work as described herein.** The Superintendent of Public Works reserves the right to phase work based on school zones, municipal refuse collection routes, other municipal projects within the area or other restrictions that may affect when a street can be milled and resurfaced. During the contract period, streets may be added and/or deleted based on available funding and the immediate needs of the City.

The contract term is set for one (1) year with two (2) additional one (1) year options to renew the contract based on the sole recommendations of the City of Woburn. The right is reserved to reject any and all bids or parts of bids and to make an award as may be determined to be in the best interests of the City of Woburn.

The Contract Documents, including Specifications and Drawings, may be examined at the Purchasing Department, City Hall, 10 Common Street, Woburn, Massachusetts 01801, on and after **February 27, 2020** between the hours of 9:00 A.M. and 4:30 P.M., Monday through Wednesday, 9:00 A.M. and 7:00 P.M on Thursday and 9:00 A.M. and 1:00 P.M on Friday. Copies of the Contract Documents may be obtained at the Office of the Purchasing Agent’s website at WWW.CITYOFWOBURN.COM.

Each bid must be accompanied by bid security in the form of certified check, cashier’s check; treasurer’s check or bid bond in an amount not less than 5 percent of the value of the bid. Bidders may not withdraw their bids for a period of 30 calendar days after the bid opening.

Attention of bidders is called particularly to the requirements as to conditions of employment to be observed and minimum rates to be paid under the contract as determined by the Department of Labor and Industries under the provisions of the Massachusetts General Laws, Chapter 149, Section 26-27D inclusive.

Bids must be submitted in triplicate, in a sealed envelope, clearly labeled “Water System Improvements, Year 11”, IFB 20-07, or they may be rejected.

Participation Goals, effective as of July 1, 2011: Pursuant to MGL. Chapter 7, § 40N, the goals for MBE and WBE participation established for this municipal contract, are as follows:

MBE/WBE: Combined Goal of 10.4% of the Contract Price.

In accordance with G.L. c. 23A, § 44 and G.L. c. 7, § 40N, the Contractor shall comply with all applicable requirements for the Work promulgated by the Massachusetts State Office of Minority and Women Business Assistance (SOMWBA). Refer to for further information: www.somwba.state.ma.us

The successful bidder will be required to furnish a Performance Bond in an amount equal to 100 percent of the contract price and a Labor and Material Payment Bond, in an amount equal to 50 percent of the contract price, for the faithful performance of the Contract. The right is reserved to waive any informalities in or to reject any or all bids received, and to award the contract to any of the Contractors bidding on the work if, in the City's opinion, the best interests of the City thereby will be promoted.

Complete instructions for the filing of bids are included in Section 00100 of the Contract Documents, Instructions to Bidders.

CITY OF WOBURN, MASSACHUSETTS

Orazio Deluca
Purchasing Agent

Section 00100
INFORMATION FOR BIDDERS
Water System Improvements, Year 11
IFB 20-07

1. RECEIPT AND OPENING OF BIDS

The City of Woburn, Massachusetts, herein called the Awarding Authority, will receive sealed Bids for Construction of the work to be done under this Contract, including the following, all as indicated on the Contract Drawings and specified herein:

- A. Furnish all labor, materials, tools and equipment for the project as specified on the attached drawings and specifications.
- B. The construction of all incidentals to complete work as described above.

Such bids, addressed to the City of Woburn, and clearly marked “**Water System Improvements, Year 11**”, **IFB 20-07** will be received at the Office of the Woburn Purchasing Agent, City Hall, 10 Common St., Woburn, Massachusetts 01801, until the date and time stated in the Invitation to Bid,

2. BID FORM

- A. Each Bid shall be submitted on the required Forms for General Bids. These forms shall be removed and submitted separately. All blank spaces for bid prices must be filled in with the lump sum and unit prices for which the Bid is being submitted. **Three copies of the bid forms must be submitted.**
- B. Bid forms must be completed in ink or by typewriter. Where so indicated, amounts shall be stated in words and figures. Discrepancies between words and figures will be resolved in favor of words. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.
- C. A Bid which includes for any item a Bid Price that is abnormally low or high may be rejected as unbalanced.
- D. A bid security in the amount of 5% of the bid shall accompany each bid. The bid security may be in the form of certified check, cashier’s check; treasurer’s check or bid bond.

3. AVAILABILITY OF DOCUMENTS

The Contract Documents, including Specifications and Drawings, may be examined at the Purchasing Department, City Hall, 10 Common Street, Woburn, Massachusetts 01801, on and after **February 27, 2020** between the hours of 9:00 A.M. and 4:30 P.M., Monday through Wednesday, 9:00 A.M. and 7:00 P.M on Thursday and 9:00 A.M. and 1:00 P.M on Friday. Copies of the Contract Documents may be obtained at the Office of the Purchasing Agent’s website at WWW.CITYOFWOBURN.COM

4. ALTERNATES

Where Alternates exist in the bid, each Bidder shall acknowledge Alternates on the Form for General Bid by entering the dollar amount of addition or subtraction necessitated by the Alternate. In the event an Alternate does not involve a change in the amount of the base bid, the Bidder shall so indicate by writing "No Change", or "N.C." or "0" in space provided that Alternate.

5. COMPARISON OF BIDS

- A. Bids will be compared on the basis of the extended prices (unit price times the quantity) stated in the Bid.
- B. In the event of a discrepancy between written and numerical figures in extended prices, the written figures shall govern.

6. WITHDRAWAL OF BIDS

- A. Any bid may be withdrawn prior to the time designated for receipt of bids upon written request. Withdrawal of bids must be received over the Bidder's signature prior to the date and time set for receipt of bids.
- B. Bidders may not withdraw or modify their bids for a period of 30 days, Saturday, Sunday and legal holidays excluded, following the opening of the bids.

7. ADDENDA AND INTERPRETATIONS

All questions by prospective bidders as to the interpretations of the Information for Bidders, bid forms, form of contract, general and supplementary conditions, drawings, specifications or bonds, must be submitted in writing to Orazio DeLuca, MCPPO (odeluca@cityofwoburn.com) Chief Procurement Officer-Purchasing Department, City Hall, 10 Common St, Woburn, Massachusetts 01810, by **March 12, 2020 at 11:00 AM**. An interpretation of all questions so raised which, in the Engineer's opinion requires interpretation, will be made public via addendum issued by the Purchasing Department. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under this bid as submitted. All addenda so issued shall be covered in the Bid and shall become part of the Contract Documents.

8. DELETIONS FROM CONTRACT

The Awarding Authority reserves the right, prior to award of the Contract, to delete any portion of the contractor's work as its interests may appear, and to adjust the quantities of work at any time.

9. EXAMINATION

By submitting a bid, the bidder warrants that it has examined the site of the work, the specifications and drawings and is fully acquainted with all conditions and restrictions pertaining to the work and the execution thereof. No claim for any extra work or extension of time will be allowed for failure to observe this requirement. Conditional bids will not be accepted.

10. CONTRACT TIME

All work of the Contract, excluding final payment only, shall be completed by **June 30, 2021**. The Owner wishes to proceed with this project as soon as practical.

11. ABILITY AND EXPERIENCE

- A. The Owner will not award a contract to any bidder who cannot furnish satisfactory evidence of their ability and experience in this type of work and that they have sufficient plant and capital to enable them to prosecute and complete the work within the given time period.
- B. The Owner may make such investigations as it deems necessary to determine the above and a bidder shall furnish any information requested in this regard and shall furnish same under oath if required.

12. INSURANCE CERTIFICATES

The Contractor will not be permitted to start any construction work until they have submitted certificates of insurance acceptable to the Awarding Authority and Owner. Certificates shall be submitted at the time of execution of the contract. Refer to Special Supplementary Conditions for details regarding the insurance requirements under this contract.

13. RIGHTS OF THE OWNER

- A. The Owner may reject, as informal, bids that are incomplete, conditional, or obscure, or that contain additions or erasures that are not initialed or other irregularities.
- B. The Owner reserves the right to reject any or all bids or to accept any bid as their interests may appear.
- C. The Owner anticipates awarding a contract for this project within ten (10) days of the date of bid opening; however, this date is subject to change. Bidders shall be prepared to submit within five (5) working days all documents and information required for full execution of the Contract Agreement. If the Contractor fails to do so, the Owner reserves the right to rescind the Contract Award.

14. EXECUTION OF THE AGREEMENT

- A. Within ten (10) days of the receipt of the Agreement signed by the successful bidder, the Owner shall sign the Agreement and return a duplicate of the executed Agreement.
- B. The Notice to Proceed shall be issued within ten (10) days of the execution of the Agreement. This time period may be extended by mutual agreement between the Owner Authority and the Contractor.

15. MINIMUM WAGE RATES

Construction associated with this contract is governed by the Massachusetts Prevailing Wage law.

16. SAFETY AND HEALTH REGULATIONS

- A. The successful bidder shall comply with the Department of Labor Safety and Health Regulations for

Construction promulgated under the Occupational Safety and Health Act of 1970 (PC-91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL-91-54).

- B. The successful bidder shall have a competent person or persons, as required under Occupational Safety and Health Act, on the Site to inspect the work and to supervise the conformance of the work with the regulations of the Act.
- C. This project is subject to the Safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part 1926. Contractors shall be familiar with the requirements of these regulations. Contractors must provide copies of OSHA certification cards for all employees to be utilized for this project.

17. NON-DISCRIMINATION IN EMPLOYMENT

- A. Contracts for work under this proposal shall obligate the Contractor and any Subcontractors not to discriminate in employment practices.
- B. Bidders for the General Contract must submit with their initial bid a signed statement as to whether they have previously performed work subject to the President's Executive Order No. 11246, or any preceding similar Executive Order.
- C. Bidders must, if requested, submit a compliance report concerning their employment practices and policies in order to maintain their eligibility to receive the award of the contract.
- D. Bidders must, if requested, submit a list of all subcontractors who will perform work on the project and submit written signed statements from authorized agents of the labor pools with which they will or may deal for employees on the work, together with supporting information to the effect that said labor pools' practices and policies are in conformity with Executive Order 11246, and that said labor pools will affirmatively cooperate in or offer no hindrance to the recruitment, employment, and equal treatment of employees seeking employment and performing work under the Contract, or certification as to what efforts have been made to secure such statement when such agents or labor pools have failed to furnish same prior to the Award of the Contract.

18. ACCESS TO THE SITE

Representatives of the City of Woburn, the Grant Awarding Agency and of the Commonwealth of Massachusetts shall have access to the work wherever it is in preparation or progress and the successful Bidder shall provide proper facilities for such access and inspection.

19. "OR EQUAL" CLAUSE

- A. Whenever the specifications define the material or article required by using the name of the proprietary product or of a manufacturer or vendor rather than by using descriptive detail of substance and function, the words "or equal" are to be understood to follow immediately the name of the maker, vendor, or proprietary product. The words, "or equal" shall be interpreted as including any material or article which, in the opinion of the Project Engineer, is equal in quality, durability, appearance, strength and design to the article named and which will perform adequately the functions imposed by the general design.
- B. Whenever in the specifications the names of manufacturers are mentioned as indicating that their products will comply with a particular specification, or when specific trade names or plate numbers or

letters are mentioned, it is not intended to exclude products of other manufacturers whose names, trade names or symbols have not been mentioned, provided however, that such products otherwise comply, in the opinion of the Project Engineer, with the specification. The Project Engineer's opinion in all cases mentioned in this section shall be final.

20. PROJECT GUARANTEE

- A. The Contractor guarantees that the work and services to be performed under the Contract and all work, material, and equipment performed, furnished, used or installed in the construction of the same, shall be free from defects and flaws and shall be performed and furnished in strict accordance with the Drawings, Specifications, and other Contract Documents; that the strength of all parts of all manufactured equipment shall be adequate and as specified and that the performance test requirements of the Contract shall be fulfilled. This guarantee shall be for a period of one (1) year from and after the date of completion and acceptance of the work as stated in the final estimate. If part of the work is accepted by the Owner, the guarantee for that part of the work shall be for a period of one (1) year from the date fixed for such acceptance.
- B. If at any time within said period of guarantee any part of the work requires repairing, correction or replacement, the Owner may notify the Contractor in writing to make the required repairs, correction or replacements to the satisfaction of the Owner within three (3) days from the date of receipt of such notice, or having commenced fails to prosecute such work with diligence, the Owner may employ other persons to make the same, and all direct and indirect costs of making said repairs, corrections or replacements, including compensation for additional professional services, shall be paid by the Contractor.
- C. It is hereby, however, agreed and understood that this guarantee shall not include any repairs or replacements made necessary by any cause or causes other than improper, inadequate, or defective work, quality of the work, materials or design by the Contractor or those employed directly or indirectly by the Contractor.

21. INFORMATION NOT GUARANTEED

- A. All information given on the Drawings or in the other Contract Documents relating to subsurface and other conditions, natural phenomena, existing pipes, and other structures is from the best sources available to the Owner. All such information is furnished only for the information and convenience of bidders and is not guaranteed.
- B. It is agreed and understood that the Owner 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 on the Drawings or in the other Contract Documents.
- C. It is agreed further and understood that no bidder or contractor shall use or be entitled to use any of the information made available to them or obtained in any examination made by them in any manner as a basis of or ground for any claim or demand against the Owner or the Project Engineer, 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 be otherwise expressly provided for in the Contract Documents.

22. LAWS AND REGULATIONS

The Bidder's attention is directed to the fact that all applicable Federal Laws, State Laws and municipal ordinances related to the construction of the project shall apply to the contract throughout, as though herein written out in full.

23. METHOD OF AWARD - LOWEST RESPONSIBLE AND ELIGIBLE BIDDER

- A. The Contract will be awarded on the basis of the lowest bid of the Base Bid submitted by a responsible and eligible bidder if such bid does not exceed the amount of funds available to finance the Contract.
- B. If the amount of available funds exceeds the lowest bid of the Base Bid, the Contract will be awarded on the basis of the total bid for the Base Bid plus Alternates, to the extent that there are available funds. The Owner may select no or all Alternates, or any combination of Alternates in descending numerical order, to the extent that there are available funds. The Contract will be awarded on this basis to the lowest Qualified Bidder of the Base Bid and Alternates selected (if any).
- C. During the period of the Contract, the Owner shall have the right to add Alternate items through a Change Order at the Bid Price shown on the Form for General Bid.

24. SEVERABILITY

If any provisions of this Agreement or portion of such provision of the application thereof to any persons, entity, or circumstances is held invalid, the remainder of the Agreement (or remainder of such provision) and the application of such to other persons, entities, or circumstances shall not be affected thereby so long as such remaining or modified provisions reflect the intent of the parties.

25. 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.

30. NOTICE OF REQUIREMENTS RELATING TO SUBCONTRACTOR

Bidders are specifically advised that the following conditions apply to any person for, or other party to whom it is proposed to award a subcontract under this contract:

- A. The Subcontractor must be acceptable to the Owner and is subject to verification by the Owner of its eligibility to perform work under this contract.

Section 00300
STATEMENT OF BIDDER'S QUALIFICATIONS
And Bid Forms

1.01 BIDDERS AFFIDAVIT

All questions must be answered, and the data given must be clear and comprehensive. This statement must be notarized. If necessary, Questions may be answered on separate attached sheets. The Bidder may submit any additional information he desires.

1. Name of Bidder.
2. Permanent main office address
3. When organized?
4. If a corporation, where incorporated?
5. How many years have you been engaged in the contracting business under your present firm or trade name?
6. Contracts on hand: (Schedule these, showing amount of each contract and the appropriate anticipated dates of completion.)
7. General character of work performed by your company.
8. Have you ever failed to complete any work awarded to you? If so, where and why?
9. List the more important projects recently completed by your company, stating the approximate cost for each and the month and year completed.
10. Experience in construction work similar in importance to this project.
11. List your major equipment available for this contract.
12. Background and experience of the principal members of your organization, including the officers
13. Credit available: \$_____.
14. Give bank references: _____.
15. List all MassDOT pre-qualifications held: _____
16. The undersigned hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Owner or the Engineer in verification or recitals comprising this Statement of Bidder's Qualifications.

Dated at _____ this _____ day of _____, 20____.

By: _____
Title: _____

State of _____)

) ss

County of _____)

_____ being duly sworn, deposes and say that he is _____ of _____ and that the answers to the foregoing questions and all statements therein contained are true and correct.

Subscribe and sworn to me before this _____ day of _____, 20____.

Notary Public

My commission expires _____, 20____.

1.02 BID BOND

PROJECT: "Water System Improvements, Year 11", IFB 20-07

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned

_____ as PRINCIPAL, AND _____

and SURETY, are held and firmly bound unto the _____

called the OWNER in the penal sum of _____ (\$ _____), lawful money of the United State, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the accompanying bid, dated _____, 20____, for _____.

NOW THEREFORE, if Principal shall not withdraw said bids within the period specified therein after the opening of the same, or, if not period be specified, within sixty (60) days after the said opening, and shall within the period specified therefore, or if not period specified, within ten (10) days after the prescribed forms are presented to him for signature, enter into a written Contract with the OWNER in accordance with the Bid as accepted and give bond with good and sufficient surety or sureties, as may be required for the faithful performance and proper fulfillment of such Contract; or in the event of the withdrawal of said Bid within the period specified, or the failure to enter into such Contract and give such bond within the time specified, if the Principal shall pay the OWNER the difference between the amount specified in said Bid and the amount of with the OWNER may procure the required work or supplies for both, in the latter be in excess of the former, then the above obligation shall be voice and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bonded parities have executed this instrument under there several seals this _____day of _____, 20____, the name and corporate seal of each corporate party being thereto affixed and presented duly signed by this undersigned representative, pursuant to authority of its governing body.

In presence of:

_____ (SEAL)
(Individual Principal)

Business Address _____

Partnership _____ (SEAL)

Business Address _____

Attest: By _____(Corp. Principal)

Business Address _____

By _____

Attest: By _____ (Affix Corp. Seal)

Attest: By _____ (Corp. Surety)

By _____

Countersigned
By

Attorney-in-Fact,
State of _____

1.03 CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the _____

Secretary of the Corporation names as Principal in the within bond; that _____,
who signed and said bond on behalf of the Principal was then _____
of said corporation; and that I know his signature, and his signature thereto is genuine; and
that said bond was duly signed, sealed, and attested to for and in behalf of said corporation by
authority of this governing body.

Title _____ (Corporate Seal)

PROJECT

IDENTIFICATION: **“Water System Improvements, Year 11”, IFB 20-07**

THIS BID IS SUBMITTED TO: **Orazio DeLuca, Purchasing Agent
Woburn City Hall
10 Common Street
Woburn, MA 01801
(781) 897-5950**

1. The undersigned BIDDER proposes and agrees, if the BID is accepted, to enter into an Agreement with OWNER to complete all Work as specified or indicated in the Contract Documents for the Contract Price and within the Contract time indicated in this Bid and in accordance with the Contract Documents.
2. BIDDER accepts all of the terms and conditions of the Instructions to Bidders. This Bid will remain open for sixty days after the day of Bid opening. BIDDER will sign the Agreement and submit the Contract Surety and other documents required by the Contract Documents within fifteen days after the date of the OWNER’S Notice of Award.
3. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:

3.1 BIDDER has examined copies of all the Contract Documents and of the following addenda:

Date	Number
------	--------

(receipt of all of which is hereby acknowledged) and also copies of the Notice to Bidders and the Instructions to Bidders.

3.2 BIDDER has examined the site and locality where the Work is to be performed, the legal requirements (federal, state and local laws, ordinances, rules and regulations) and the conditions affecting cost, progress of performance of the Work and has made such independent investigations as BIDDER deems necessary.

3.3 This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation, and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for himself any advantage over any other Bidder or over OWNER.

- 4. BIDDER will complete the Work for the prices shown in the attached Bid Forms.
- 5. BIDDER agrees that the work will be completed on or before **June 30, 2021**.
- 6. The following documents are attached to and made a condition of the Bid:
 - 6.1 A tabulation of Subcontractors and other persons or organizations required to be identified in this Bid.
 - 6.2 Required Bidders Qualification Statement with supporting data (if requested by the Owner or the Engineer).
- 7. Communication concerning this Bid shall be addressed to:

Orazio DeLuca, Purchasing Agent
Woburn City Hall
10 Common Street
Woburn, MA 01801
(781) 897-5950
mgauthier@cityofwoburn.com

- 8. The terms used in this Bid which are defined in the General Conditions of the Construction Contract, included as part of the Contract Documents, have the meanings assigned to them in the General Conditions.

SUBMITTED on _____, 20____

The BIDDER is:
An Individual

By _____ (SEAL)
(Individual's Name)

Doing business as _____

Business address: _____

Telephone No.: _____
A Corporation

By _____
(Corporation Name)

(State of Incorporation)

By _____
(Name of person authorized to sign)

(Corporation Seal) _____
Attest

(Secretary)

Business Address: _____

Telephone No.: _____

A Joint Venture

By _____
(Name)

(Address)

By _____
(Name)

(Address)

By _____
(Name)

(Address)

(Each joint venture must sign. The manner of signing for each individual, partnership, and corporation that is party to the joint venture should be in the manner indicated above.)

**Water System Improvements, Year 11
IFB 20-07**

CHECKLIST OF ITEMS TO BE SUBMITTED WITH BID

- Form for General Bid
- Certification as to Corporate Vote
- Non-Collusion Affidavit
- Certification of Payment of State Taxes
- OSHA General Contractor Certification Form
- Certificate of Authority
- Certificate of Good Standing
- Request for Taxpayer Identification Number and Certification
- Compliance Plan - Direct/indirect participation of Subcontractors/Suppliers/Consultants

FORM FOR GENERAL BID

Water System Improvements, Year 11, IFB 20-07

BID FORM

Bid of _____ (herein after called the "Bidder), a _____ corporation /a partnership /an individual (strike out inapplicable terms) doing business as _____.

To City of Woburn (hereinafter called the "City"):

The undersigned hereby declares to have carefully examined the Contract Invitation to Bid, Information for Bidders, form of Contract and General, Supplementary, and Special Conditions, Specifications and Contract Drawings referred to and also the site upon which the proposed work is to be performed.

- A. The undersigned also hereby declares that the winning Bidder is the only person interested in the bid: that it is made without any connection with any person making any bid for the same work; that no person acting for, or employed by the City of Woburn is directly or indirectly interested in this Bid, or in any contract which may be made under it, or in expected profits to arise there from: that it is bona fide and made without directly or indirectly influencing or attempting to influence any other person or corporation to bid or to refrain from bidding or to influence the amount of the bid of any other person or corporation, and without collusion or fraud with any other person or connection with any other person bidding for the same work; and that this Bid is made with distinct reference and relation to the plans and specifications prepared for this contract and herein mentioned. The undersigned declares that in regard to the conditions affecting the work to be done and the labor and materials needed, this Bid is based solely on its own investigation and research and not in the reliance upon any representations of any employee, officer or agent of the City. As used herein, the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal identity.
- B. No oral, written or telegraphic amendments to this Bid will be accepted. A bidder wishing to amend this Bid after transmittal to the City may do so only by amending this Bid itself prior to the time for opening the bids.
Drainage Structure
- C. The undersigned propose to furnish all labor, equipment and material required for the "**Water System Improvements, Year 11**", **IFB 20-07**, located in Woburn, Massachusetts, in accordance with the accompanying Contract Documents, Plans and Specifications prepared by the Woburn Engineering Department, within the time set forth herein for the Contract Prices specified below, subject to additions and deductions according to the terms of the Contract Documents. These prices are to cover all expenses incurred in performing the work required under the Contract Documents, of which this Bid is a part.

This Bid includes the Addenda numbered _____.

The undersigned proposes to perform the Work, furnish all materials, and complete the Work in its entirety in the manner and under the conditions required at the prices listed as follows:

Item #	Quantity	Written Description and Unit Bid Price	Unit Cost (in figures)	Total Cost (in figures)
1a	3,900 LF	Cleaning and lining of 6-inch water main using the drag-line method, Including; removal/replacement of existing main line gate valves, testing and chlorinating, temporary services, and pavement.		
		_____ Dollars	\$ _____	\$ _____
		per linear foot	per linear foot	Total Extended Cost
1b	2,200 LF	Install 8 in., cement-lined, ductile iron water pipe, valves and fittings, including earth excavation, disposal, backfill and final pavement.		
		_____ Dollars	\$ _____	\$ _____
		per linear foot	per linear foot	Total Extended Cost
1c	850	Install 12 in., cement-lined, ductile iron water pipe, valves and fittings including earth excavation, disposal, backfill and pavement.		
		_____ Dollars	\$ _____	\$ _____
		per linear foot	per linear foot	Total Extended Cost
1e	14	Additional cost to furnish and install 6 inch, 8 inch, and 12 inch sideline gate valves and appurtenances at intersecting streets will be measured as the actual number of 6", 8" and 12" gate assemblies installed and accepted by the engineer, including earth excavation, disposal, backfill and temporary and permanent pavement.		
		_____ Dollars	\$ _____	\$ _____
		per linear foot	per linear foot	Total Extended Cost
2a	40	Install 1 in. corporation stops, including earth excavation, disposal, backfill and temporary pavement		
		_____ Dollars	\$ _____	\$ _____
		per linear foot	per linear foot	Total Extended Cost
2b	40	Install 1 in. curb stops, including curb box, earth excavation, disposal, backfill and temporary pavement		
		_____ Dollars	\$ _____	\$ _____
		per linear foot	per linear foot	Total Extended Cost
2c	600	Install 1 in. type K copper tubing and fittings to reconnect to the existing water services, including earth excavation, disposal, backfill and temporary pavement.		
		_____ Dollars	\$ _____	\$ _____
		per linear foot	per linear foot	Total Extended Cost

Note: Unit prices have been established by the City for the remaining work items. The undersigned bidder agrees to perform any work not included in the bid items above at the unit cost listed below.

Item #	Quantity	Written Description and Unit Bid Price	Unit Cost	Total Cost
3	100	Miscellaneous concrete and/or controlled density fill at One Hundred Fifty and 00/100 Dollars	\$ 150.00	\$ 15,000.00
		per cubic yard		
4a	25	Rock Excavation At Eighty and 00/100 Dollars	\$ 80.00	\$ 2,000.00
		per cubic yard		
4b	25	Boulder Excavation At Sixty and 00/100 Dollars	\$ 60.00	\$ 1,500.00
		per cubic yard		
5a	350	Screened gravel for utility crossings and miscellaneous purposes At twenty five and 00/100 Dollars	\$ 25.00	\$ 12,250.00
		per cubic yard		
5b	250	Common fill replacement of unsuitable backfill and miscellaneous purposes At Twenty and 00/100 Dollars	\$ 20.00	\$ 5,000.00
		per cubic yard		
6	85	Excavation below normal grade, including backfill to return to normal grade At Eighteen and 00/100 Dollars	\$ 18.00	\$ 1,530.00
		per cubic yard		
7	8	Install new hydrant assemblies including: 6-in gate valve with box cover; 6-in restrained joint, cement-lined ductile iron water main; new hydrant, earth excavation and backfill; temporary and permanent pavement At Five thousand, Six hundred and 00/100 Dollars	\$ 5,600.00	\$ 44,800.00
		per each		
8	5	Remove obstructions including: cutting existing Piping; refitting piping; earth excavation and Backfill; bracing and temporary pavement At Five thousand and 00/100 Dollars	\$ 5,000.00	\$ 25,000.00
		per each		

BID SUMMARY WORKSHEET

Total for Item #1a	\$ _____
Total for Item #1b	\$ _____
Total for Item #1c	\$ _____
Total for Item #1d	\$ _____
Total for Item #1e	\$ _____
Total for Item #1f	\$ _____
Total for Item #1g	\$ _____
Total for Item #1h	\$ _____
Total for Item #2a	\$ _____
Total for Item #2b	\$ _____
Total for Item #2c	\$ _____
Total for Item #3	\$ <u>15,000.00</u>
Total for Item #4a	\$ <u>2,000.00</u>
Total for Item #4b	\$ <u>1,500.00</u>
Total for Item #5a	\$ <u>12,250.00</u>
Total for Item #5b	\$ <u>5,000.00</u>
Total for Item #6	\$ <u>1,530.00</u>
Total for Item #7	\$ <u>44,800.00</u>
Total for Item #8	\$ <u>25,000.00</u>
TOTAL BID PRICE:	\$ _____

- D. In submitting this Bid, the Bidder understands that the City reserves the right to reject any or all of the bids, and to waive any informalities in the bidding. The City further reserves the right to award the base bid contract and any or all of the alternates indicated above.
- E. The Bidder agrees that this Bid shall be good and may not be withdrawn for a period of Sixty (60) calendar days after scheduled closing time for receiving bids.
- F. Upon receipt of written notice of the acceptance of this bid, Bidder will execute a contract within 10 days.
- G. The undersigned further certifies under the penalties of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under provisions of §29F of MGL c.29 or any other applicable debarment provisions of any chapter of federal or Massachusetts General Laws or any rule or regulation promulgated thereunder.
- H. The undersigned further certifies that they are able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work and that they will comply fully with all laws and regulations applicable to awards made subject to Davis-Bacon regulations.
- I. The undersigned agrees that all sub-contractors that perform work on this project will do so under a written agreement with the Contractor.

Respectfully submitted:

(Seal – if bid is by a corporation)

(Name of General Bidder)

By _____
(Name of Person Signing Bid and Title)

(Business Address)

Federal ID# _____

(Municipality and State)

CERTIFICATION AS TO CORPORATE VOTE

If a corporation, complete below or attach to each signed copy of the Contract a notarized copy of vote of corporation authorizing the signatory to sign this Contract.

At a duly authorized meeting of the Board of Directors of the

_____ held on _____
(Name of Corporation) (Date)

at which all the Directors were present or waived notice, it was VOTED, that,

_____ held on _____
(Name) (Officer)

of this company be and hereby is authorized to execute contract and bonds in the name and behalf of said company, and affix its corporate seal thereto; and such execution of any contract or obligation in this company's name on its behalf by such

_____ of the company, shall be valid
(Officer)

and binding upon this company.

A true copy,

ATTEST: _____
(Clerk)

Place of Business: _____

I hereby certify that I am the Clerk of _____, that
(Name of Corporation)
_____ is the duly elected _____ of
(Name) (Officer)

said company, and that the above vote has not been amended or rescinded and remains in full force and effect as the date of this Contract.

(Corporate Seal)

NON-COLLUSION AFFIDAVIT

The undersigned certifies under penalties of perjury that this Bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this section the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

Signature and Title

Company Name

Date

CERTIFICATION OF PAYMENT OF STATE TAXES

Pursuant to M.G.L. Chapter 62C, Sec. 49A, I certify under the penalties of perjury that I, to the best of my knowledge and belief, have filed all state tax returns and paid all state taxes required under law.

Name of Company

Social Security Number or
Federal Identification Number

Signature and Title

Date

OSHA GENERAL CONTRACTOR CERTIFICATION FORM

Pursuant to Chapter 306 of the Acts of 2004

An Act Relative to the Health and Safety on Construction Projects GENERAL

CONTRACTOR'S CERTIFICATION – BID FORM

I, the undersigned, hereby certify under penalties of perjury that I, and all subcontractors who are not filed sub-bidders, shall:

- (1) certify that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is a least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee.

As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

Signature: _____
(Individual Submitting Bid)

Duly Authorized

Name of Business or Entity: _____

Date: _____

RETURN THIS FORM WITH YOUR BID

CERTIFICATE OF AUTHORITY

At a duly authorized meeting of the Board of Directors of _____
(Name of Corporation)

held on _____ it was
VOTED that: (Date)

(Name)

(Officer)

of this corporation, be and he/she hereby is authorized to submit bids and proposals, execute contracts, deeds and bonds in the name and on behalf of said corporation, and affix its corporate seal hereto; and such execution of any contract, deed or obligation in this corporation's name on its behalf by such _____ under seal of the company, shall be valid (Officer) and binding upon this corporation.

A True Copy,

ATTEST: _____

TITLE: _____

PLACE OF BUSINESS: _____

DATE OF THIS CERTIFICATE:

I hereby certify that I am the clerk of the _ _____
(Corporation)

that _____ is the duly elected
_____ of (Name)
(Office)

said corporation, and that the above vote has not been amended or rescinded and remains in full force and effect as of the date of this contract.

(Clerk)

CORPORATE SEAL:

CERTIFICATE OF GOOD STANDING

TO: Contractor
FROM: Purchasing Department
RE: CERTIFICATE OF GOOD STANDING

The Contractor must comply with our request for a CURRENT “Certificate of Good Standing”.

If you require information on how to obtain the “Certificate of Good Standing” or Certificate of Registration (Foreign Corporations) from the Commonwealth of Massachusetts, please call the Secretary of State’s Office at (617) 727-2850 (Press #1) located at One (1) Ashburton Place, 17th Floor, Boston, MA 02133 or you may access their web site at:

www.sec.state.ma.us/corp/certificates/certificate_request.asp

If your company is incorporated outside of Massachusetts and therefore is a “foreign corporation”, but is registered to do business in Massachusetts, please comply with our request for the Certificate of Registration from the Commonwealth of Massachusetts. If your company is a foreign corporation, but is not registered to do business in Massachusetts, please provide the Certificate of Good Standing from your state of incorporation.

Please note that without the above certificate (s), the City of Woburn cannot execute your contract.

IMPORTANT NOTICE

Requests for Certificates of Good Standing by mail may take a substantial amount of time. A certificate may be obtained immediately in person at the Secretary’s Office at the address above. Also, at this time, the Secretary of State’s Office may not have your current annual report recorded. If this is the case, and you are therefore unable to obtain the Certificate of Good Standing, please forward a copy of your annual report filing fee check with your signed contracts. Please forward your original Certificate of Good Standing to the Purchasing Department upon receipt.

Thank You,

Purchasing Agent

Request for Taxpayer Identification Number and Certification

Give Form to the requester. Do not send to the IRS.

Name (as shown on your income tax return)	
Business name/disregarded entity name, if different from above	
Check appropriate box for federal tax classification:	
<input type="checkbox"/> Individual/sole proprietor <input type="checkbox"/> C Corporation <input type="checkbox"/> S Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Trust/estate	
<input type="checkbox"/> Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=:partnership) ... _____	
<input type="checkbox"/> Other (see instructions) <small>Use</small>	
Address (number, street, and apt. or suite no.)	Requester's name and address (optional)
City, state, and ZIP code	
List account number(s) here (optional)	

Exempt payee

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on the "Name" line to avoid backup withholding. For individuals, this is your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the Part I instructions on page 3. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN* on page 3.

Social security number

Employer identification number

Note. If the account is in more than one name, see the chart on page 4 for guidelines on whose number to enter.

Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me), and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report an interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding, and
3. I am a U.S. citizen or other U.S. person (defined below).

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions on page 4.

Sign _____
 Here _____ U.S. person..-

Date _____ **General Instructions**

Section references are to the Internal Revenue Code unless otherwise noted.

Purpose of Form

A person who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) to report, for example, income paid to you, real estate transactions, mortgage interest you paid, acquisition or abandonment of secured property, cancellation of debt, or contributions you made to an IRA.

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN to the person requesting it (the requester) and, when applicable, to:

1. Certify that the TIN you are giving is correct (or you are waiting for a number to be issued),
2. Certify that you are not subject to backup withholding, or
3. Claim exemption from backup withholding if you are a U.S. exempt payee. If applicable, you are also certifying that as a U.S. person, your allocable share of any partnership income from a U.S. trade or business is not subject to the withholding tax on foreign partners' share of effectively connected income.

Note. If a requester gives you a form other than Form W-9 to request your TIN, you must use the requester's form if it is substantially similar to this Form W-9.

Definition of a U.S. person. For federal tax purposes, you are considered a U.S. person if you are:

- An individual who is a U.S. citizen or U.S. resident alien,
- A partnership, corporation, company, or association created or organized in the United States or under the laws of the United States,
- An estate (other than a foreign estate), or
- A domestic trust (as defined in Regulations section 301.7701-7).

Special rules for partnerships. Partnerships that conduct a trade or business in the United States are generally required to pay a withholding tax on any foreign partners' share of income from such business.

Further, in certain cases where a Form W-9 has not been received, a partnership is required to presume that a partner is a foreign person, and pay the withholding tax. Therefore, if you are a U.S. person that is a partner in a partnership conducting a trade or business in the United States, provide Form W-9 to the partnership to establish your U.S. status and avoid withholding on your share of partnership income.

Compliance Plan - Direct/indirect Participation of Subcontractors/Suppliers/Consultants

M/WBE firms may participate in the performance of this contract, either DIRECTLY or INDIRECTLY, as: Prime Bidders/Proposers; Joint Venture Partners; Subcontractors; and/or Suppliers. (if performing INDIRECTLY approval by CPS is required.)

Name of M/WBE Firm Race/Gender		
Address:		
City/State/Zip: Email:		
Telephone No. Fax CPS Vendor No.		
Contact Person		
Dollar Amt. \$	%	Participation: Direct Y N Indirect Y N
Description of Commodity/Services:		

Name of M/WBE Firm Race/Gender		
Address		
City/State/Zip Email:		
Telephone No. Fax CPS Vendor No.		
Contact Person		
Dollar Amt. \$	%	Participation Direct Y N Indirect Y N
Description of Commodity/Services		

Name of M/WBE Firm Race/Gender		
Address		
City/State/Zip Email:		
Telephone No. Fax CPS Vendor No.		
Contact Person		
Dollar Amt. \$	%	Participation Direct Y N Indirect Y N
Description of Commodity/Services		

Total WBE Direct \$ _____ % Total

WBE Indirect \$ _____ %

Total MBE Direct \$ _____ %

Total MBE Indirect \$ _____ %

Section 00500 AGREEMENT
**OWNER-CONTRACTOR AGREEMENT FOR PUBLIC
WORKS CONSTRUCTION**

THIS AGREEMENT made this _____ day of _____ in the year **2020**, between _____; with a usual place of business at _____ thereinafter called the CONTRACTOR, and the **City of Woburn**, acting by its Mayor, with a usual place of business at City Hall, 10 Common Street, Woburn, MA 01801-4139, hereinafter called the OWNER.

The CONTRACTOR and the OWNER, for the consideration hereinafter named, agree as follows:

1. Scope of Work

The Contractor shall furnish all labor, materials, equipment, and insurance to perform all work required for the project known as the **“Water System Improvements, Year 11”, IFB 20-07** in strict accordance with the Contract Documents and all related Drawings and Specifications. The said Documents, Specifications, Drawings, and any GENERAL SUPPLEMENTARY CONDITIONS are incorporated herein by reference and are made a part of this Agreement.

2. Contract Price

The Owner shall pay the Contractor for the performance of this Agreement, subject to additions and deductions provided herein, in current funds, the sum of \$ _____ based **on the unit prices tendered with the bid.**

3. Commencement and Completion of Work

It is agreed that time is of the essence of this Agreement. The Contractor shall commence and prosecute the work under this Agreement upon execution hereof and shall complete the work on or before June **30, 2020**.

- A. Definition of Term. The Term “Substantial completion” shall mean the date certified by the Owner when construction is sufficiently complete, in accordance with the Contract Documents, so the Owner may occupy the project, or designated portion(s) thereof, for the use for which it is intended.
- B. Time as Essential Condition. It is understood and agreed that the commencement of and substantial completion of the work are essential conditions of this Agreement. It is further agreed that time is of the essence for 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 Documents any additional time is allowed for the completion of any work, the new time fixed by such extension shall be of the essence of this Agreement. It is understood and agreed that the times for the completion of the work are reasonable, taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.
- C. Progress and Completion. Contractor shall commence work promptly upon execution of this Agreement and shall prosecute and complete the work regularly, diligently and uninterruptedly at such a rate of progress as will insure Substantial Completion within the stipulated number of calendar days.

4. Performance of the Work

A. Direction of the Work. The Contractor shall supervise and direct the Work, using his best skills and attention which shall not be less than such state of skill and attention generally rendered by the contracting profession for projects similar to the Project in scope, difficulty and location. The Contractor shall maintain adequate supervisory personnel at the project site during the performance of the Work. He shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Agreement.

B. Responsibility for the Work

- a. The Contractor shall be responsible to the Owner for the acts and omissions of his employees, Subcontractors and their agents and employees, and other persons performing any of the Work under a contract with the Contractor. This obligation shall also extend to the presence on the Site of suppliers of materials or equipment, their employees, contractors, and agents engaged in the work.
- b. The Contractor shall not be relieved from his obligations to perform the Work in accordance with the Contract Documents either by the activities or duties of the Owner in its administration of the Agreement, or by inspections, tests or approvals required or performed by persons other than the Contractor.

C. Permits and Fees. Unless otherwise expressly provided, the Contractor shall secure and pay for all permits and fees, licenses and inspections necessary for the proper execution and completion of the Work which are customarily secured after execution of the Agreement and which are legally required at the time the bids are received, and the same shall at all times be the property of the Owner and shall be delivered to the Owner upon completion of the Project.

D. Notices, Compliance With Laws

- a. The Contractor shall give all notices and comply with all federal, state and local laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the performance of the Work. The Contractor shall provide the Owner with reproductions of all permits, licenses and receipts for any fees paid. The Owner represents that it has disclosed to the Contractor all orders and requirements known to the Owner of any public authority particular to this Agreement.
- b. If the Contractor observes that any of the Contract Documents are at variance with applicable laws, statutes, codes and regulations in any respect, he shall promptly notify the Owner in writing, and any necessary changes shall be accomplished by appropriate modification.
- c. If the Contractor performs any Work which he knows or should know is contrary to such laws, ordinances, rules and regulations, and without such notice to the Owner, he shall assume full responsibility therefor and shall bear all costs attributable thereto.
- d. In the performance of the Work, the Contractor shall comply with all applicable federal, state and local laws and regulations including those relating to workplace and employee safety. The Contractor shall notify the Owner immediately of any conditions at the place of

the work which violate said laws and regulations and shall take prompt action to correct and eliminate any such violations.

- E. Project Superintendent. The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site at all times during the progress of the Work. The superintendent shall represent the Contractor and all communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be so confirmed on written request in each case.
- F. Progress Schedule. The Contractor, immediately after being awarded the Contract, shall prepare and submit for the Owner's information an estimated progress schedule for the Work. The progress schedule shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.
- G. Drawings, Specifications, and Submittals
- a. The Contractor shall maintain at the site for the Owner one record copy of all Drawings, Specifications, Addenda, Change Orders, and other Modifications, and "As-Built" Drawings and Specifications in good order and marked currently to record all changes made during construction, and approved Shop Drawings, Product Data, and Samples. These shall be delivered to the Owner upon completion of the Work.
 - b. By approving and submitting Shop Drawings, Product Data, and Samples, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.
 - c. The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Owner's approval of Shop Drawings, Product Data or Samples unless the Contractor has specifically informed the Owner in writing of such deviation at the time of submission and the Owner has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data, or Samples by the Owner's approval thereof.
 - d. The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the Owner on previous submittals.
 - e. No portion of the Work requiring submission of a Shop Drawing, Product Data, or Sample shall be commenced until the submittal has been approved by the Owner. All such portions of the Work shall be in accordance with approved submittals.
- H. Protection of the Work and Owner's Property. The Contractor shall at all times safely guard the Owner's property from injury or loss in connection with this Agreement. He shall at all times safely guard and protect his own work, and that of adjacent property from damage. The Contractor shall replace or make good any such damage, loss or injury. The Contractor shall clean the work area and restore it to its original condition upon completion of the work.

- I. Quality of the Work. The Contractor shall perform the work in a good, workmanlike manner. The Contractor hereby guarantees that the entire work constructed by him under the Agreement will meet fully all requirements thereof as to quality of workmanship and materials. The Contractor hereby agrees to make at his own expense any repairs or replacements made necessary by defects in materials or workmanship supplied to him that become evident within one (1) year after the date of the final payment, and to restore to full compliance with the requirements set forth herein any part of the work constructed hereunder, which during said one (1) year period is found to be deficient with respect to any provisions of the Contract Documents. The Contractor also agrees to hold the Owner harmless from claims of any kind arising from damage due to said defects. The Contractor shall make all repairs and replacements promptly upon receipt of written orders for same from the Owner. If the Contractor fails to make the repairs and replacements promptly, the Owner may do the work and the Contractor shall be liable to the Owner for the cost thereof.
- J. Warranty. The Contractor guarantees to Owner that all materials incorporated into the work will be new unless otherwise specified or agreed. Prior to final payment, the Contractor shall deliver to the Owner all manufacturers' warranties, together with such endorsements or assignments as are necessary to ensure to the Owner the full rights and benefits of such warranties.

5. Affirmative Action/Equal Employment Opportunity

The Contractor is directed to comply with all applicable State Laws, Ordinances, Bylaws, and rules and regulations regarding affirmative action/equal employment opportunity requirements. Failure of the Contractor to comply with any such law, rule or regulation shall constitute grounds for the Owner to terminate the Agreement.

6. Site Information Not Guaranteed; Contractor's Investigation

All information given in the Contract Documents relating to subsurface and other conditions, natural phenomena, existing pipes, and other structures is from the best sources at present available to the Owner. All such information is furnished only for the information and convenience of the Contractor and is not guaranteed.

It is agreed and understood that the Owner 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 Documents.

Contractor has familiarized himself with the nature and extent of the Contract Documents, work, locality, and with all local conditions and federal, state, and local laws, rules, ordinances, and regulations that in any manner may affect costs, progress, or performance of the work. Contractor has made, or has caused to be made, examinations, investigations, and tests and studies of such reports and related data in addition to those referred to in the paragraph above as he deems necessary for the performance of the work at the Contract Price, within the Contract Time, and in accordance with the other Terms and Conditions of the Contract Documents; and no additional examinations, tests, investigations, reports, and similar data are or will be required by the Contractor for such purposes.

Contractor has correlated the results of all such observations, examinations, investigations, tests, reports, and data with the Contract Documents. Contractor has given the Owner written notice of

all conflicts, errors, or discrepancies that he has discovered in the Contract Documents, and the resolution thereof by the Owner is acceptable to the Contractor.

It is further agreed and understood that the Contractor shall not 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 Owner, arising from or by reason of any variance which may exist between the information made available and the actual subsurface conditions or other conditions or structures actually encountered during the construction work, except as may otherwise be expressly provided for in the Contract Documents.

7. Project Engineer

The City Engineering Department is the representative of the Owner (Public Works Superintendent) and the Contractor shall direct all communications, questions and comments on the work and the performance thereof to the City Engineer with copies to the DPW Superintendent. Except as otherwise provided, the City Engineer shall have all the authority of the Owner set forth in the Contract Documents. In general, the City Engineer shall have the authority to review the performance of the work, reject work which is defective or otherwise does not comply with the Contract Documents and to order the Contractor to remedy defective work and take such actions which are necessary to make the work conform to the Contract Documents.

8. Wage Rates

Prevailing Wage Rates as determined by the Commissioner of the Department of Labor and Workforce Development under the provisions of Massachusetts General Laws, Chapter 149, Section 26 to 27G, as amended, apply to this project. It is the responsibility of the Contractor to provide the City with certified payrolls and to comply with all requirements of the above-cited statutes.

The schedules of prevailing wage rates were included in the initial bid documentation.

9. Payments to the Contractor

- A. The Owner shall make payment to the Contractor in accordance with the provisions of Sections 39F and 39G of Chapter 30 of the General Laws of the Commonwealth of Massachusetts. The Contractor shall submit requisitions for payment as required by said provisions and the directions of the Owner.
- B. The Contractor's applications for payment shall be subject to approval by the Engineer.
- C. Changes in the Work. No changes in the work covered by the approved Contract Documents shall be made without prior written approval of the Owner. Charges or credits for the work covered by the approved change shall be determined by one or more, or a combination of the following method:
 - a. Unit bid prices previously approved

To the cost under (c) there shall be added a fixed fee to be agreed upon but not to exceed fifteen percent (15%) of the actual cost of work. The fee shall be compensation to cover the cost of supervision, overhead, bonds, profit and any other general expenses.

D. Claims for Additional Costs. If the Contractor wishes to make a claim for an increase in the Contract Sum, he shall give the Owner written notice thereof within twenty days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the Work, except in an emergency endangering life or property. No such claim shall be valid unless so made. Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.

10. Final Payment, Effect

The acceptance of final payment by the Contractor shall constitute a waiver of all claims by the Contractor arising under the Agreement.

11. Contract Documents

The Contract Documents consist of the following, together with this Agreement:

Invitation to Bid Instructions to Bidders
This Contract Form Bid Form
Performance Bond
Labor & Materials Payment Bond Non-Collusion
Certificate
Tax Compliance Certificate
Clerk's Certificate of Corporate Vote Certificate of Insurance
General Conditions Supplementary General
Conditions General Requirements Specifications and
Addenda Contract Drawings
Schedule of Prevailing Wages

12. Terms Required By Law

This Agreement shall be considered to include all terms required to be included in it by the Massachusetts General Laws, and all other laws, applicable to the work required under this Agreement as though such terms were set forth in full herein.

13. Affirmative Marketing Program for State Assisted Projects

A. M.G.L., Chapter 193 of the Acts of 2004 established an Affirmative Marketing Program for municipal projects that are funded, in whole or in part, by state financial assistance in order to assure that Minority Business Enterprises (MBE) and Women Business Enterprises (WBE) certified by the State Office of Minority and Women Business Assistance (SOMWBA) have the opportunity to participate in state assisted building projects.

Effective July 1, 2011 the revised MBE/WBE Participation Goals for public agencies and municipalities with Affirmative Marketing Programs under G.L.c.7, § 40N, Executive Order or policy shall be combined goals as follows:

10.4% Combined MBE/WBE participation on Construction Projects

- B. In accordance with M.G.L., Chapter 23A, Section 44 and chapter 7, Section 40N, the Contractor shall comply with all applicable requirements for the Work promulgated by the Massachusetts State Office of Minority and Women Business Assistance (SOMWBA).

14. Employee OSHA Safety Training

Pursuant to M.G.L., Chapter 30, Section 39S, the Contractor hereby certifies under the penalties of perjury as follows:

- (1) that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work;
- (2) that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration at the time the employee begins work and that he shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and
- (3) that all employees to be employed in the work subject to this contract have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least ten (10) hours in duration.

15. Indemnification

The Contractor shall indemnify and hold harmless the Owner from and against any and all claims, damages, losses, and expenses, including attorney's fees, arising out of the performance of this Agreement when such claims, damages, losses, and expenses are caused, in whole or in part, by the acts, errors, or omissions of the Contractor or his employees, agents, subcontractors or representatives.

16. Insurance

The Contractor shall purchase and maintain such insurance as will protect both the Owner and the Contractor from claims which may arise under the Agreement, including operations performed for the named insured by independent contractors and general inspection thereof by the named insured. In addition, the Contractor shall require its subcontractors to maintain such insurance. Coverage shall be provided for:

- A. Claims under workers' or workmens' compensation, disability benefit and other applicable employee benefit acts;
- B. Claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
- C. Claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

D. Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person;

E. Claims for damages, including damages to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;

F. Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle; and

G. Claims involving contractual liability applicable to the Contractor's obligations under Article 13.

The limits of liability for coverage required under the preceding paragraph shall be as required by the Owner.

Except for Workmen's Compensation, all liability coverage shall name the City of Woburn as an additional insured and shall provide for 30 days prior written notice to the City of any modification or termination of coverage provided thereby. The Contractor shall provide the Owner with appropriate certificate(s) of insurance evidencing compliance with this provision prior to the commencement of any work under this Agreement.

17. Notice

All notices required to be given hereunder shall be in writing and delivered to, or mailed first class to, the parties' respective addresses stated above. In the event that immediate notice is required, it may be given by telephone or facsimile, but shall, to the extent possible, be followed by notice in writing in the manner set forth above.

18. Termination

A. Each party shall have the right to terminate this Agreement in the event of a failure of the other party to comply with the terms of the Agreement. Such termination shall be effective upon seven days' notice to the party in default and the failure within that time of said party to cure its default.

B. The Owner shall have the right to terminate the Agreement without cause, upon ten (10) days' written notice to the Contractor. In the event that the Agreement is terminated pursuant to this subparagraph, the Contractor shall be reimbursed in accordance with the Contract Documents for all Work performed up to the termination date, and for all materials or equipment not incorporated in the Work, but delivered and suitably stored at the site. Payment for material or equipment stored at the site shall be conditioned upon submission by the Contractor of bills of sale or such other evidence as is satisfactory to Owner to establish the Owner's title to such material or equipment or otherwise protect the Owner's interests.

19. Miscellaneous

A. Royalties and Patents. The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof, except that the Owner shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified; but if

the Contractor believes or has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Owner, and thereafter the Owner insists on the use of the design, process or products specified.

- B. Assignment. The Contractor shall not assign or transfer any of its rights, duties or obligations under this Agreement without the written approval of the Owner.
- C. Governing Law. This Agreement shall be governed by and construed in accordance with the law of the Commonwealth of Massachusetts.

IN WITNESS WHEREOF, the parties hereto have set their hands and seals, the Owner by its authorized representatives who, however, incur no personal liability by reason of the execution hereof or of anything herein contained, as of the day and year first above written.

CITY OF WOBURN, MA

Scott D. Galvin, Mayor

I certify that an appropriation is available In
the amount of this Contract:

Charlie Doherty, City Auditor

Account #

Ellen Callahan Doucette, Esq., City Solicitor

Orazio Deluca, Purchasing Director

John E. Corey, PE, City Engineer

Contractor

By: _____

Name: _____

Title: _____

Section 00550
CHANGE ORDER FORM

Date: _____

Project: **Year 10 Cleaning and Lining** _____

Change Order No. **1** _____

Contract Amount (As Bid): _____

Contractor: _____

Amount of Previous Change Orders: **\$0.00** _____

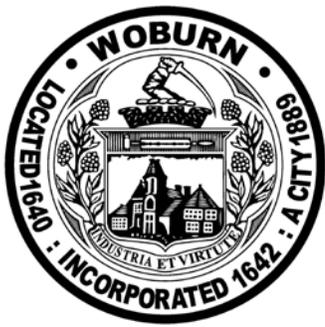
Net Change in Contract Price
(this Change Order): _____

Total Adjusted Contract Price
(including this Change Order): _____

Reason for Change in Contract:

The details of additional cost for this work have been enclosed.

Attachments: Itemized costs
Cost Summary Sheet



City of Woburn

Permit issued by D.P.W.
 50 North Warren Street
 Woburn, MA 01801
 Phone (781) 897-5980
 FAX (781) 897-5989

Permit Number _____
 Date Issued _____
 Expiration Date _____

TRENCH PERMIT

Pursuant to G.L. c. 82A §1 and 520 CMR 7.00 et seq.(as amended)

THIS PERMIT MUST BE FULLY COMPLETED PRIOR TO CONSIDERATION

Name of Applicant			Phone	Cell
Street Address				
City/Town	MA	ZIP		
Name of Excavator (if different from applicant)			Phone	Cell
Street Address				
City/Town	MA	ZIP		
Name of Owner(s) of Property			Phone	Cell
Street Address				
City/Town	MA	ZIP		
Other Contact			Permit Fee Received No () Yes ()	
Description, location and purpose of proposed trench: Please describe the exact location of the proposed trench and its purpose (include a description of what is (or is intended) to be laid in proposed trench (eg; pipes/cable lines etc..) Please use reverse side if additional space is needed.				
Insurance Certificate #:				
Name and Contact Information of Insurer:				
Policy Expiration Date:				
Dig Safe #:				
Name of Competent Person (as defined by 520 CMR 7.02):				

Massachusetts Hoisting License #	
License Grade:	Expiration Date:

BY SIGNING THIS FORM, THE APPLICANT, OWNER, AND EXCAVATOR ALL ACKNOWLEDGE AND CERTIFY THAT THEY ARE FAMILIAR WITH, OR, BEFORE COMMENCEMENT OF THE WORK, WILL BECOME FAMILIAR WITH, ALL LAWS AND REGULATIONS APPLICABLE TO WORK PROPOSED, INCLUDING OSHA REGULATIONS, G.L. c. 82A, 520 CMR 7.00 et seq., AND ANY APPLICABLE MUNICIPAL ORDINANCES, BY-LAWS AND REGULATIONS AND THEY COVENANT AND AGREE THAT ALL WORK DONE UNDER THE PERMIT ISSUED FOR SUCH WORK WILL COMPLY THEREWITH IN ALL RESPECTS AND WITH THE CONDITIONS SET FORTH BELOW.

THE UNDERSIGNED OWNER AUTHORIZES THE APPLICANT TO APPLY FOR THE PERMIT AND THE EXCAVATOR TO UNDERTAKE SUCH WORK ON THE PROPERTY OF THE OWNER, AND ALSO, FOR THE DURATION OF CONSTRUCTION, AUTHORIZES PERSONS DULY APPOINTED BY THE MUNICIPALITY TO ENTER UPON THE PROPERTY TO MONITOR AND INSPECT THE WORK FOR CONFORMITY WITH THE CONDITIONS ATTACHED HERETO AND THE LAWS AND REGULATIONS GOVERING SUCH WORK.

THE UNDERSIGNED APPLICANT, OWNER AND EXCAVATOR AGREE JOINTLY AND SEVERALLY TO REIMBURSE THE MUNICIPALITY FOR ANY AND ALL COSTS AND EXPENSES INCURRED BY THE MUNICIPALITY IN CONNECTION WITH THIS PERMIT AND THE WORK CONDUCTED THEREUNDER, INCLUDING BUT NOT LIMITED TO ENFORCING THE REQUIREMENTS OF STATE LAW AND CONDITIONS OF THIS PERMIT, INSPECTIONS MADE TO ASSURE COMPLIANCE THEREWITH, AND MEASURES TAKEN BY THE MUNICIPALITY TO PROTECT THE PUBLIC WHERE THE APPLICANT OWNER OR EXCAVATOR HAS FAILED TO COMPLY THEREWITH INCLUDING POLICE DETAILS AND OTHER REMEDIAL MEASURES DEEMED NECESSARY BY THE MUNICIPALITY.

THE UNDERSIGNED APPLICANT, OWNER AND EXCAVATOR AGREE JOINTLY AND SEVERALLY TO DEFEND, INDEMNIFY, AND HOLD HARMLESS THE MUNICIPALITY AND ALL OF ITS AGENTS AND EMPLOYEES FROM ANY AND ALL LIABILITY, CAUSES OR ACTION, COSTS, AND EXPENSES RESULTING FROM OR ARISING OUT OF ANY INJURY, DEATH, LOSS, OR DAMAGE TO ANY PERSON OR PROPERTY DURING THE WORK CONDUCTED UNDER THIS PERMIT.

APPLICANT SIGNATURE

_____ DATE _____

EXCAVATOR SIGNATURE (IF DIFFERENT)

_____ DATE _____

OWNER'S SIGNATURE (IF DIFFERENT)

_____ DATE: _____

For City/Town use -- Do not write in this section	
PERMIT APPROVED BY	\$ _____ Application Fee
PERMITTING AUTHORITY	
CONDITIONS OF APPROVAL	

CONDITIONS AND REQUIREMENTS PURSUANT TO G.L.C.82A AND 520 CMR 7.00 et seq. (as amended)

By signing the application, the applicant understands and agrees to comply with the following:

- i. No trench may be excavated unless the requirements of sections 40 through 40D of chapter 82, and any accompanying regulations, have been met and this permit is invalid unless and until said requirements have been complied with by the excavator applying for the permit including, but not limited to, the establishment of a valid excavation number with the underground plant damage prevention system as said system is defined in section 76D of chapter 164 (DIG SAFE);
- ii. Trenches may pose a significant health and safety hazard. Pursuant to Section 1 of Chapter 82 of the General Laws, an excavator shall not leave any open trench unattended without first making every reasonable effort to eliminate any recognized safety hazard that may exist as a result of leaving said open trench unattended. Excavators should consult regulations promulgated by the Department of Public Safety in order to familiarize themselves with the recognized safety hazards associated with excavations and open trenches and the procedures required or recommended by said department in order to make every reasonable effort to eliminate said safety hazards which may include covering, barricading or otherwise protecting open trenches from accidental entry.
- iii. Persons engaging in any in any trenching operation shall familiarize themselves with the federal safety standards promulgated by the Occupational Safety and Health Administration on excavations: 29 CFR 1926.650 et.seq., entitled Subpart P "Excavations".
- iv. Excavators engaging in any trenching operation who utilize hoisting or other mechanical equipment subject to chapter 146 shall only employ individuals licensed to operate said equipment by the Department of Public Safety pursuant to said chapter and this permit must be presented to said licensed operator before any excavation is commenced;
- v. By applying for, accepting and signing this permit, the applicant hereby attests to the following: (1) that they have read and understands the regulations promulgated by the Department of Public Safety with regard to construction related excavations and trench safety; (2) that he has read and understands the federal safety standards promulgated by the Occupational Safety and Health Administration on excavations: 29 CMR 1926.650 et.seq., entitled Subpart P "Excavations" as well as any other excavation requirements established by this municipality; and (3) that he is aware of and has, with regard to the proposed trench excavation on private property or proposed excavation of a city or town public way that forms the basis of the permit application, complied with the requirements of sections 40-40D of chapter 82A.
- vi. This permit shall be posted in plain view on the site of the trench.

For additional information please visit the Department of Public Safety's website at www.mass.gov/dps

Summary of Excavation and Trench Safety Regulation (520 CMR 14.00 et seq.)

This summary was prepared by the Massachusetts Department of Public Safety pursuant to G.L.c.82A and does not include all requirements of the 520 CMR 14.00. To view the full regulation and G.L.c.82A, go to www.mass.gov/dps. Pursuant to M.G.L. c. 82, § 1, the Department of Public Safety, jointly with the Division of Occupational Safety, drafted regulations relative to trench safety. The regulation is codified in section 14.00 of title 520 of the Code of Massachusetts Regulations. The regulation requires all excavators to obtain a permit prior to the excavation of a trench made for a construction-related purpose on public or private land or rights-of-way. All municipalities must establish a local permitting authority for the purpose of issuing permits for trenches within their municipality. Trenches on land owned or controlled by a public (state) agency requires a permit to be issued by that public agency unless otherwise designated.

In addition to the permitting requirements mandated by statute, the trench safety regulations require that all excavators, whether public or private, take specific precautions to protect the general public and prevent unauthorized access to unattended trenches. Accordingly, unattended trenches must be covered, barricaded or backfilled. Covers must be road plates at least ¾" thick or equivalent; barricades must be fences at least 6' high with no openings greater than 4" between vertical supports; backfilling must be sufficient to eliminate the trench. Alternatively, excavators may choose to attend trenches at all times, for instance by hiring a police detail, security guard or other attendant who will be present during times when the trench will be unattended by the excavator.

The regulations further provide that local permitting authorities, the Department of Public Safety, or the Division of Occupational Safety may order an immediate shutdown of a trench in the event of a death or serious injury; the failure to obtain a permit; or the failure to implement or effectively use adequate protections for the general public. The trench shall remain shutdown until re-inspected and authorized to re-open provided, however, that excavators shall have the right to appeal an immediate shutdown. Permitting authorities are further authorized to suspend or revoke a permit following a hearing. Excavators may also be subject to administrative fines issued by the Department of Public Safety for identified violations.

Summary of 1926 CFR Subpart P -OSHA Excavation Standard

This is a worker protection standard, and is designed to protect employees who are working inside a trench. This summary was prepared by the Massachusetts Division of Occupational Safety and not OSHA for informational purposes only and does not constitute an official interpretation by OSHA of their regulations, and may not include all aspects of the standard. For further information or a full copy of the standard go to www.osha.gov.

- **Trench Definition per the OSHA standard:**
 - An excavation made below the surface of the ground, narrow in relation to its length.
 - In general, the depth is greater than the width, but the width of the trench is not greater than fifteen feet.
- **Protective Systems** to prevent soil wall collapse are always required in trenches deeper than 5', and are also required in trenches less than 5' deep when the competent person determines that a hazard exists. Protection options include:
 - Shoring. Shoring must be used in accordance with the OSHA Excavation standard appendices, the equipment manufacturer's tabulated data, or designed by a registered professional engineer.
 - Shielding (Trench Boxes). Trench boxes must be used in accordance with the equipment manufacturer's tabulated data, or a registered professional engineer.
 - Sloping or Benching. In Type C soils (what is most typically encountered) the excavation must extend horizontally 1 ½ feet for every foot of trench depth on both sides, 1 foot for Type B soils, and ¾ foot for Type A soils.
 - A registered professional engineer must design protective systems for all excavations greater than 20' in depth.
- **Ladders** must be used in trenches deeper than 4'.
 - Ladders must be inside the trench with workers at all times, and located within 25' of unobstructed lateral travel for every worker in the trench.
 - Ladders must extend 3' above the top of the trench so workers can safely get onto and off of the ladder.
- **Inspections** of every trench worksite are required:
 - Prior to the start of each shift, and again when there is a change in conditions such as a rainstorm.
 - Inspections must be conducted by the competent person (see below).
- **Competent Person(s) is:**
 - Capable (i.e., trained and knowledgeable) in identifying existing and predictable hazards in the trench, and other working conditions which may pose a hazard to workers, and
 - Authorized by management to take necessary corrective action to eliminate the hazards. Employees must be removed from hazardous areas until the hazard has been corrected.
- **Underground Utilities** must be:
 - Identified prior to opening the excavation (e.g., contact Digsafe).
 - Located by safe and acceptable means while excavating.
 - Protected, supported, or removed once exposed.
- **Spoils** must be kept back a minimum of 2' from the edge of the trench.
- **Surface Encumbrances** creating a hazard must be removed or supported to safeguard employees. Keep heavy equipment and heavy material as far back from the edge of the trench as possible.
- **Stability of Adjacent Structures:**
 - Where the stability of adjacent structures is endangered by creation of the trench, they must be underpinned, braced, or otherwise supported.
 - Sidewalks, pavements, etc. shall not be undermined unless a support system or other method of protection is provided.
- **Protection from water accumulation hazards:**
 - It is not allowable for employees to work in trenches with accumulated water. If water control such as pumping is used to prevent water accumulation, this must be monitored by the competent person.
 - If the trench interrupts natural drainage of surface water, ditches, dikes or other means must be used to prevent this water from entering the excavation.
- **Additional Requirements:**
 - For mobile equipment operated near the edge of the trench, a warning system such as barricades or stop logs must be used.
 - Employees are not permitted to work underneath loads. Operators may not remain in vehicles being loaded unless vehicles are equipped with adequate protection as per 1926.601(b)(6).
 - Employees must wear high-visibility clothing in traffic work zones.
 - Air monitoring must be conducted in trenches deeper than 4' if the potential for a hazardous atmosphere exists. If a hazardous atmosphere is found to exist (e.g., O₂ <19.5% or >23.5%, 20% LEL, specific chemical hazard), adequate protections shall be taken such as ventilation of the space.
 - Walkways are required where employees must cross over the trench. Walkways with guardrails must be provided for crossing over trenches > 6' deep.
 - Employees must be protected from loose rock or soil through protections such as scaling or protective barricades.

Section 00610
PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That we _____
(Name of Contractor)

a _____ hereinafter called "Principal" and
(Corporation, Partnership, Joint Venture or Individual)

_____ of _____, State of _____
(Surety) (City)

_____ hereinafter called the "Surety" and licensed by the State Division of Insurance to do business under the laws of the Commonwealth of Massachusetts, are held and firmly bound to the City of Woburn, Massachusetts, hereinafter called "Owner", in the penal sum of _____ Dollars (\$_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas the Principal has entered into a certain contract with the Owner (the "Construction Contract"), dated the _____ day of _____, 20____, for the construction described as follows:
_____.

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements of the Construction Contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety, and if he shall satisfy all claims and demands incurred under the Construction Contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void; otherwise, this obligation shall remain in full force and effect.

PROVIDED, FURTHER, that the Surety's obligation under this Bond shall arise after (1) the Owner has declared the Principal in default of the Construction Contract or (2) has declared that the Principal has failed, or is otherwise unable or unwilling, to execute the work consistent with, and in conformance to, the Construction Contract (collectively referred to as a "Contractor Default"). The determination of a Contractor Default shall be made solely by the Owner.

When the Surety's obligation under this Bond arises, the Surety, at its sole expense and at the consent and election of the Owner, shall immediately take one of following steps: (1) arrange for the Principal to perform and complete the work of the Construction Contract; (2) arrange for a contractor other than the Principal to perform and complete the work of the Construction Contract; (3) reimburse the Owner, in a manner and at such time as the Owner shall decide, for all costs and expenses incurred by the Owner in performing and completing the work of the Construction Contract.

ATTEST:

(SEAL)

By

Surety

(Attorney-in-Fact)

(Address-Zip Code)

Witness as to Surety

(Address-Zip Code)

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is a Partnership, all partners should execute Bond.

Section 00620
PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That we

_____, a _____
(Name of Contractor) (Corporation, Partnership, Joint Venture or Individual)

hereinafter called "Principal" and _____
(Surety)

of _____, State of _____

hereinafter called the "Surety" and licensed by the State Division of Insurance to do business under the laws of the Commonwealth of Massachusetts, are held and firmly bound to the City of Woburn, Massachusetts, hereinafter called "Owner", in the penal sum of _____ Dollars

(\$ _____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the Owner, dated the _____ day of _____, 20____, a copy of which is hereto attached and made a part hereof for the construction described as follows:

Water System Improvements Year 11

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any way affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of this contract or to the work or to the specifications.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in six (6) counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20_____.

ATTEST:

By _____
(Principal Secretary)

Principal

(Address-Zip Code)

Witness as to Principal

(Address-Zip Code)

(SEAL)

ATTEST:

By _____
(Attorney-in-Fact)

Surety

(Address-Zip Code)

(SEAL)

Witness as to Surety

(Address-Zip Code)

NOTE: If Contractor is a Partnership, all partners should execute Bond.

Section 00700
GENERAL CONDITIONS

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Section 00700

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

ARTICLE 1

CONTRACT DOCUMENTS

1.1 DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents consist of the Owner-Contractor Agreement, the Conditions of the Contract (General, Supplemental and other Conditions), the Drawings, the Specifications, all Addenda issued prior to and all Modifications issued after execution of the Contract, and all applicable laws, ordinances and regulations. A Modification is (1) a written amendment to the contract signed by both parties, (2) a Change Order, (3) a written interpretation issued by the Owner or (4) a written order for a minor change in the Work issued by the Owner pursuant to Paragraph 12.3. The Contract Documents include Bidding Documents such as the Advertisement or Invitation to Bid, the Instructions to Bidders, sample forms, the Contractor's Bid or portions of Addenda relating to any of these, or any other documents, specifically enumerated in the Owner-Contractor Agreement.

1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. This Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification as defined in Subparagraph 1.1.1.

1.1.3 THE WORK

The Work comprises the completed construction required by the Contract Documents and includes all labor necessary to produce such construction, and all materials and equipment incorporated or to be incorporated in such construction.

1.1.4 THE PROJECT

The project is the total construction of which the Work performed under the Contract Documents may be the whole or a part.

1.1.5 "OR EQUAL"

The use of the words "Or Equal" following the name of any manufacturer, vendor or proprietary product shall be understood to mean that articles or materials may be substituted which, in the opinion of the Owner, are equal in quality, durability, appearance, strength, design and performance to the articles or materials named or described and will perform adequately in providing a first-class facility.

When submitting shop drawing information on articles or materials which are being proposed as substitutes for specified items, the Contractor shall clearly identify them as such. If the articles or materials are accepted as equal to those on which dimensions on the drawings are based, any dimensional variance from those shown and/or specified shall be shown on the shop drawings prepared by the Contractor, illustrating the manner in which conformity to dimensions and design is to be obtained. All such drawings shall be subject to the approval of the Owner and the installation of the article shall not proceed without first obtaining said approval.

1.2 EXECUTION, CORRELATION AND INTENT

1.2.1 The Contract Documents shall be signed in not less than quadruplicate by the Owner and Contractor.

1.2.2 By executing the Contract, the Contractor represents that he has visited the site, familiarized himself with the local conditions under which the Work is to be performed, and correlated his observations with the requirements of the Contract Documents.

1.2.3 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work. The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all. Work not covered in the Contract Documents will not be required unless it is consistent therewith and is reasonably

inferable therefrom as being necessary to produce the intended results. Words and abbreviations which have well-known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings.

1.2.4 The organization of the Specifications into divisions, sections and articles, and the arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

1.3 OWNERSHIP AND USE OF DOCUMENTS

1.3.1 All Drawings, Specifications and copies thereof furnished by the Owner are and shall remain the Owner's property. They are to be used only with respect to this Project and are not to be used on any other project without the prior written consent of the Owner. With the exception of one contract set for each party to the Contract, such documents are to be returned or suitably accounted for to the Owner at the completion of the Work. Submission or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of any reserved rights.

ARTICLE 2

2.1 ADMINISTRATION OF THE CONTRACT

2.1.1 The designated representative of the Owner or its Engineer will visit the site at intervals appropriate to the stage of construction to familiarize himself generally with the progress and quality of the Work and to determine in general if the Work is proceeding in accordance with the Contract Documents. However, the Owner's Representative or Engineer will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work.

2.1.2 The Owner shall at all times have access to the Work wherever it is in preparation and progress. The Contractor shall provide facilities for such access so the Owner may perform its functions under the Contract Documents.

2.1.3 Based on the Owner's observations and an evaluation of the Contractor's Applications for Payment, the Owner will determine the amounts owing to the Contractor and will issue Certificates for Payment in such amounts, as provided in Paragraph 9.4.

2.1.4 The Owner will render information necessary for the proper execution or progress of the Work within twenty (20) days of any request by the contractor or in accordance with any time limit agreed upon.

2.1.5 The Owner will have authority to reject Work which does not conform to the Contract Documents. Whenever, in his opinion, he considers it necessary or advisable for the implementation of the intent of the Contract Documents, he will have authority to require special inspection or testing of the Work in accordance with Subparagraph 7.7.2 whether or not such Work be then fabricated, installed or completed. Any such rejection of work shall not relieve the Contractor of the responsibility for maintaining protection of the Work and the Owner's property.

2.1.6 The Owner or its Engineer will review and approve or take other appropriate action upon Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for conformance with the design concept of the Work and with the information given in the Contract Documents. Such action shall be taken with reasonable promptness so as to cause no delay. The Owner's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

2.1.7 The Owner will prepare Change Orders in accordance with Article 12, and will have authority to order minor changes in the Work as provided in Subparagraph 12.4.1.

2.1.8 The Owner will conduct inspections to determine the date of Substantial Completion and Final Completion, will review written warranties and related documents required by the Contract and assembled by the Contractor, and will issue a final Certificate for Payment upon compliance with the requirements of Paragraph 9.9.

ARTICLE 3

OWNER

3.1 DEFINITION

3.1.1 The Owner is the person or entity identified as such in the Owner-Contractor Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Owner means the Owner or his authorized representative, which for this Project shall be the City Engineer..

3.1.2 The Engineer for the Project is the City of Woburn Engineering Department

3.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

3.2.1 The Owner shall, at the time of execution of the Agreement and any subsequent Change Orders, certify for the Contractor that financial arrangements have been made to fulfill the Owner's obligations under the Contract.

3.2.2 The Owner shall furnish all surveys describing the physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site.

3.2.3 Except as provided in Subparagraph 4.7.1. Owner shall secure and pay for necessary approvals, easements, assessments and charges required for the construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

3.2.4 Information or services under the Owner's control shall be furnished by the Owner with reasonable promptness to avoid delay in the orderly progress of the Work.

3.2.5 The Owner will furnish the Contractor with five copies of all Drawings and Specifications and revisions issued during the progress of the Work; all additional copies will be furnished upon request at the cost of reproduction.

3.2.6 The Owner, through its designated agent or Engineer, shall forward all instructions directly to the Contractor.

3.2.7 The foregoing are in addition to other duties and responsibilities of the Owner enumerated herein and especially those in respect to Work by Owner or by Separate Contractors, Payments and Completion, and Insurance in Articles 6, 9 and 11 respectively.

3.3 OWNER'S RIGHT TO STOP THE WORK

3.3.1 If the Contractor fails to correct defective Work as required by Paragraph 13.2 or fails to carry out the Work in accordance with the Contract Documents or if the Owner shall for any other reason so require, the Owner, by a written order signed personally or by an agent specifically so empowered by the Owner in writing, may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated or until further written notice from the Owner; however, this right of the Owner to stop the Work shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Subparagraph 6.1.3. The Contractor shall resume the Work after such stoppage promptly upon written notice to do so from the Owner. If such stoppage is required through no fault of the Contractor, the Contract Time (and the dates for achieving Substantial Completion and Final Completion) shall be extended by a period equal to the period of the stoppage, and the Contractor shall be compensated for its reasonable and justifiable costs incurred as a result of such stoppage.

3.4 OWNER'S RIGHT TO CARRY OUT THE WORK

3.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within seven days after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to any other remedy he may have, perform such work or cause such work to be performed and/or make good such deficiencies. In such case an appropriate Change Order shall be issued deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for additional services made necessary by such default, neglect or failure. If the payments then or thereafter due the Contractor are not sufficient to cover the amount, the Contractor shall pay the difference to the Owner.

ARTICLE 4

CONTRACTOR

4.1 DEFINITION

4.1.1 The Contractor is the person or entity identified as such in the Owner-Contractor Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Contractor means the Contractor or his authorized representative.

4.2 REVIEW OF CONTRACT DOCUMENTS

4.2.1 The Contractor shall carefully study and compare the Contract Documents and shall at once report to the Owner any error, inconsistency or omission he may discover. The Contractor shall not be liable to the Owner for any damage resulting from errors, inconsistencies or omissions in the Contract Documents which he discovers but shall be liable for damage to the extent he reasonably should have but failed to discover such errors, inconsistencies or omissions. The Contractor shall perform no portion of the Work at any time without Contract Documents or, where required, approved Shop Drawings, Product Data or Samples for such portion of the Work.

4.3 SUPERVISION AND CONSTRUCTION PROCEDURES

4.3.1 The Contractor shall supervise and direct the Work, using his best skill and attention which shall not be less than such state of skill and attention generally rendered by the contracting profession for projects similar to the Project in scope, difficulty and location. The Contractor shall maintain adequate supervisory personnel at the Premises during the performance of the Work. He shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract.

4.3.2 The Contractor shall be responsible to the Owner for the acts and omissions of his employees, Subcontractors and their agents and employees, and other persons performing any of the Work under a contract with the Contractor. This obligation shall also extend to the presence on the Site of suppliers of materials or equipment, their employees, contractors, and agents engaged in the work.

4.3.3 The Contractor shall not be relieved from his obligations to perform the Work in accordance with the Contract Documents either by the activities or duties of the Owner in its administration of the Contract, or by inspection, tests or approvals required or performed under Paragraph 7.7 by persons other than the Contractor.

4.4 LABOR AND MATERIALS

4.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and service necessary for the proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

4.4.2 The Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the Work any unfit person or anyone not skilled in the task assigned to him including all persons on the Site controlled directly or indirectly by the Contractor.

4.5 WARRANTY

4.5.1 The Contractor warrants to the Owner that all materials and equipment furnished under this Contract will be new and of recent manufacture unless otherwise permitted in writing by the Owner and that all Work will be of good quality, free from faults and defects and in conformance with the Contract Documents. All Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective and, promptly after written notification of non-conformance, shall be repaired or replaced by the Contractor with Work conforming to such requirements. If required by the Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. This warranty is not limited by the provisions of Paragraph 13.2.

4.6 TAXES

4.6.1 The Contractor shall pay all applicable sales, consumer, use and other similar taxes for the Work or portion thereof provided by the Contractor which are legally enacted at the time bids are received, whether or not yet effective.

4.7 PERMITS, FEES AND NOTICES

4.7.1 Unless otherwise expressly provided in the Supplemental General Conditions, the Contractor shall secure and pay for all permits and fees, licenses and inspections necessary for the proper execution and completion of the Work which are customarily secured after execution of the Contract and which are legally required at the time the bids are received, and the same shall at all times be the property of the Owner and shall be delivered to the Owner upon completion of the Project.

4.7.2 The Contractor shall give all notices and comply with all federal, state and local laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the performance of the Work. The Contractor shall provide the Owner with reproductions of all permits, licenses and receipts for any fees paid. The Owner represents that it has disclosed to the Contractor all orders and requirements known to the Owner of any public authority particular to this Contract.

4.7.3 If the Contractor observes that any of the Contract Documents are at variance with applicable laws, statutes, codes and regulations in any respect, he shall promptly notify the Owner in writing, and any necessary changes shall be accomplished by appropriate Modification.

4.7.4 If the Contractor performs any Work which he knows or should know is contrary to such laws, ordinances, rules and regulations, and without such notice to the Owner, he shall assume full responsibility therefor and shall bear all costs attributable thereto.

4.8 SUPERINTENDENT

4.8.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site at all times during the progress of the Work. The superintendent shall represent the Contractor and all communications given to the superintendent

shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be so confirmed on written request in each case.

4.9 PROGRESS SCHEDULE

4.9.1 The Contractor, immediately after being awarded the Contract, shall prepare and submit for the Owner's information an estimated progress schedule for the Work. The progress schedule shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

4.10 DOCUMENTS AND SAMPLES AT THE SITE

4.10.1 The Contractor shall maintain at the site for the Owner one record copy of all Drawings, Specifications, Addenda, Change Orders and other Modifications, and "As-Built" Drawings and Specifications in good order and marked currently to record all changes made during construction, and approved Shop Drawings, Product Data and Samples. These shall be available to the Owner upon completion of the Work.

4.11 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

4.11.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or any Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

4.11.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate a material, product or system for some portion of the Work.

4.11.3 Samples are physical examples which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

4.11.4 The Contractor shall review, approve and submit, with reasonable promptness and in such sequence as to cause no delay in the Work or in the work of the Owner or any separate contractor, all Shop Drawings, Product Data and Samples required by the Contract Documents.

4.11.5 By approving and submitting Shop Drawings, Product Data and Samples, the Contractor represents that he has determined and verified all materials, field measurements, and

field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

4.11.6 The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Owner's approval of Shop Drawings, Product Data or Samples or the Engineer's approval of the same unless the Contractor has specifically informed the Owner or Engineer in writing of such deviation at the time of submission and the Owner or Engineer has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility from errors or omissions in the Shop Drawings, Product Data or Samples by the Owner's approval thereof.

4.11.7 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the Owner or its Engineer on previous submittals.

4.11.8 No portion of the Work requiring submission of a Shop Drawing, Product Data or Sample shall be commenced until the submittal has been approved by the Owner or Engineer. All such portions of the Work shall be in accordance with approved submittals.

4.12 USE OF SITE

4.12.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with any materials or equipment.

4.13 CUTTING AND PATCHING OF WORK

4.13.1 The Contractor shall be responsible for all cutting, fitting or patching that may be required to complete the Work or to make its several parts fit together properly.

4.13.2 The Contractor shall not damage or endanger any portion of the Work or the work of the Owner or any separate contractors by cutting, patching or otherwise altering any work, or by excavation. The Contractor shall not cut or otherwise alter the work of the Owner or any separate contractor except with the written consent of the Owner and of such separate contractor.

The Contractor shall not unreasonably withhold from the Owner or any separate contractor his consent to cutting or otherwise altering the Work.

4.14 CLEANING UP

4.14.1 The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations. At the completion of the Work he shall remove all his waste materials and rubbish from and about the Project in full compliance with all applicable laws and regulations as well as all his tools, construction equipment, machinery and surplus materials and the Project shall be thoroughly cleaned and ready for immediate occupancy by the Owner.

4.14.2 If the Contractor fails to clean up at the completion of the Work, the Owner may do so as provided in Paragraph 3.4 and the cost thereof shall be charged to the Contractor.

4.15 COMMUNICATIONS

4.15.1 The Contractor shall forward all communications to the Owner through it's the City Engineer

4.16 ROYALTIES AND PATENTS

4.16.1 The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and shall save the Owner harmless from loss on account thereof, except that the Owner shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified, but if the Contractor believes or has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Owner, and thereafter the Owner insists on the use of the design, process or products specified.

4.17 INDEMNIFICATION

4.17.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, the Engineer and their agents and employees from and against all claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or

resulting from the performance of the Work, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom, and (2) is caused in whole or in part by any negligent act or omission of the Contractor, 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 it is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Paragraph 4.17.

4.17.2 In any and all claims against the Owner the Engineer or any of their agents or employees by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this Paragraph 4.17 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

4.17.3 The obligations of the Contractor under this paragraph 4.17 shall not extend to the liability of the Owner, the Engineer, their agents or employees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications, or (2) written directions or instructions given by the Owner, the Engineer, their agents or employees, provided they are the sole cause of the injury or damage.

ARTICLE 5

SUBCONTRACTORS

5.1 DEFINITION

5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform any of the Work at the site. The term Subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a

Subcontractor or his authorized representatives. The term Subcontractor does not include any separate contractor or his subcontractors.

5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform any of the Work at the site. The term Sub-subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Sub-subcontractor or an authorized representative thereof.

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 Unless otherwise required by the Contract Documents or the Bidding Documents, the Contractor, as soon as practicable after the award of the Contract, shall furnish to the Owner in writing the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the Work. The Owner will reply to the Contractor in writing within twenty (20) days stating whether or not the Owner, after due investigation, has reasonable objection to any such proposed person or entity.

5.2.2 The Contractor shall not contract with any such proposed person or entity to whom the Owner has made reasonable objection under the provisions of Subparagraph 5.2.1. The Contractor shall not be required to contract with anyone to whom he has a reasonable objection.

5.2.3 If the Owner has reasonable objection to any such proposed person or entity, the Contractor shall submit a substitute to whom the Owner has no reasonable objection.

5.2.4 The Contractor shall make no substitution for any Subcontractor, person or entity previously selected if the Owner makes reasonable objection to such substitution.

5.3 SUBCONTRACTUAL RELATIONS

5.3.1 By an appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the

Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these Documents, assumes toward the Owner. Said agreement shall preserve and protect the rights of the Owner under the Contract Documents with respect to the Work to be performed by the Subcontractor so that the subcontracting thereof will not prejudice such rights. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with his Sub-subcontractors. The Contractor shall make availability to each proposed Subcontractor, prior to the execution of the Subcontract, copies of the Contract Documents to which the Subcontractor will be bound by this Paragraph 5.3, and identify to the Subcontractor any terms and conditions of the proposed Subcontract which may be at variance with the Contract Documents. Each Subcontractor shall similarly make copies of such Documents available to his Sub-subcontractors. The Contractor shall be fully responsible to the Owner for the acts and omissions of all Subcontractors and other entities or persons directly or indirectly employed by him to perform the Work. If requested by the Owner, the form and substance of any Subcontract with the Contractor shall be subject to the prior written consent of the Owner, which consent shall not be unreasonably withheld or delayed.

ARTICLE 6

WORK BY OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER'S RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS

6.1.1 The Owner reserves the right to perform work related to the Project with his own forces, and to award separate contracts in connection with other portions of the Project or other work on the site under these or similar Conditions of the Contract. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, he shall make such claim as provided elsewhere in the Contract Documents.

6.1.2 When separate contracts are awarded for different portions of the Project or other work on the site, the term Contractor in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

6.1.3 The Owner will provide for the coordination of the work of his own forces and of each separate contractor with the Work of the Contractor, who shall cooperate therewith as provided in Paragraph 6.2.

6.2 MUTUAL RESPONSIBILITY

6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work, and shall connect and coordinate his Work with theirs as required by the Contract Documents.

6.2.2 If any part of the Contractor's Work depends for proper execution or results upon the work of the Owner or any separate contractor, the Contractor shall, prior to proceeding with the Work, promptly report to the Owner any apparent discrepancies or defects in such other work that render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acceptance of the Owner's or separate contractors' work as fit and proper to receive his Work, except as to defects which may subsequently become apparent in such work by others.

6.2.3 Any costs caused by defective or ill-timed work shall be borne by the party responsible therefor.

6.2.4 Should the Contractor cause damage to the work or property of the Owner, or to other work on the site, the Contractor shall promptly remedy such damage as provided in Subparagraph 10.2.5.

6.2.5 Should the Contractor wrongfully cause damage to the work or property of any separate contractor, the Contractor shall upon due notice promptly attempt to settle with such other contractor by agreement, or otherwise to resolve the dispute. If such separate contractor sues or initiates an arbitration proceeding against the Owner on account of any damage alleged to

have been caused by the Contractor, the Owner shall notify the Contractor who shall defend such proceedings at the Contractor's expense, and if any judgment or award against the Owner arises therefrom the Contractor shall pay or satisfy it and shall reimburse the Owner for all attorneys' fees and court or arbitrations costs which the Owner has incurred.

6.3 OWNER'S RIGHT TO CLEAN UP

6.3.1 If a dispute arises between the Contractor and separate contractors as to their responsibility for cleaning up as required by Paragraph 4.15, the Owner may clean up and charge the cost thereof to the contractors responsible therefor.

ARTICLE 7

MISCELLANEOUS PROVISIONS

7.1 GOVERNING LAW

7.1.1 The Contract shall be governed by the law of the Commonwealth of Massachusetts. All applicable provisions of Federal, state, or local laws, by-laws, rules, or regulations are incorporated into the Contract as if fully set forth herein, and shall prevail over any conflicting provisions of the General or Supplemental General Conditions.

7.2 SUCCESSORS AND ASSIGNS

7.2.1 The Owner and the Contractor each bind himself, his partners, successors, assigns and legal representatives to the other party hereto and to the partners, successors, assigns and legal representatives of such other party in respect to all covenants, agreements and obligations contained in the Contract Documents. The Contractor shall not assign the Contract or sublet it as a whole without the written consent of the Owner, nor shall the Contractor assign any moneys due or to become due to him hereunder, without the previous written consent of the Owner.

7.3 WRITTEN NOTICE

7.3.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or member of the firm or entity or to an officer of the corporation for whom it was intended, or if delivered at or sent by registered or certified mail to the last business address

known to him who gives the notice. Written Notice to the Owner shall be delivered to the Superintendent of Public Works, DPW Barns, 50 North Warren Street, Woburn, MA 01801.

7.4 CLAIMS FOR DAMAGES

7.4.1 Should either party to the Contract suffer injury or damage to person or property because of any act or omission of the other party or of any of his employees, agents or others for whose acts he is legally liable, claim shall be made in writing to such other party within a reasonable time after the first observance of such injury or damage. The reasonable time shall not exceed fourteen days.

7.5 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

7.5.1 The Contractor shall furnish a Performance Bond in an amount at least equal to one hundred percent (100%) of the Contract price as security for the faithful performance of this Contract and also a Payment Bond in an amount not less than one hundred percent (100%) of the Contract price as security for the payment of all persons performing labor on the project under this Contract and furnishing materials in connection with this Contract. The Performance Bond and the Payment Bond may be in one or in separate instruments in accordance with local law, and in a form acceptable to the Owner, and shall remain in effect through the one-year warranty period.

7.6 RIGHTS AND REMEDIES

7.6.1 The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law, except as otherwise set forth therein.

7.6.2 No action or failure to act by the Owner, the Engineer or Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any

such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

7.7 TESTS

7.7.1 If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any portion of the Work to be inspected, tested or approved, the Contractor shall give the Owner and Engineer timely notice of its readiness so the Owner and Engineer may observe such inspection, testing or approval. The Contractor shall bear all costs of such inspections, tests or approvals conducted by public authorities which are normal and customary for the type of work required by the Contract. Unless otherwise provided, the Owner shall bear all costs of other inspections, tests or approvals. All testing methods, organizations, and personnel shall be approved by the Owner or Engineer before the start of testing Work, without regard to what party will ultimately pay for such Work.

7.7.2 If the Owner or Engineer determines that any Work requires special inspection, testing, or approval which Subparagraph 7.7.1 does not include, it will instruct the Contractor to order such special inspection, testing or approval, and the Contractor shall give notice as provided in Subparagraph 7.7.1. If such special inspection or testing reveals a failure of the Work to comply with the requirements of the Contract Documents, the Contractor shall bear all costs thereof, including compensation for the Owner's additional services made necessary by such failure; otherwise the Owner shall bear such costs, and an appropriate Change Order shall be issued.

7.7.3 Required certificates of inspection, testing or approval shall be secured by the Contractor and promptly delivered by him to the Owner and Engineer.

7.7.4 If the Owner or Engineer is to observe the inspections, tests or approvals, he will do so promptly and, where practicable, at the source of supply.

ARTICLE 8

TIME

8.1 DEFINITIONS

8.1.1 Unless otherwise provided, the Contract Time is the period of time allotted in the Contract Documents for Substantial and Final Completion of the Work as defined in Subparagraph 8.1.3, including authorized adjustments thereto. Time is of the essence with regard to completion of the Work required by the Contract.

8.1.2 The date of commencement of the Work is the date established in a notice to proceed. If there is no notice to proceed, it shall be the date of the Owner-Contractor Agreement or such other date as may be established therein.

8.1.3 The Date of Substantial Completion of the Work or designated portion thereof is the Date certified by the Owner when construction is substantially complete, in accordance with the Contract Documents, other than only custom punch list items, the lack of or completion of which will not interfere with the Owner's use, so the Owner can lawfully occupy and utilize the Work or designated portion thereof for the use for which it is intended. The Date of Final Completion of the Work is the date on which the Owner issues its final Certificate for Payment in accordance with Paragraph 9.9.1 hereof.

8.1.4 The term day as used in the Contract Documents shall mean calendar day unless otherwise specifically designated.

8.2 PROGRESS AND COMPLETION

8.2.1 All time limits stated in the Contract Documents are of the essence of the Contract.

8.2.2 The Contractor shall begin the Work on the date of commencement as defined in Subparagraph 8.1.2. He shall carry the Work forward expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time, and Final Completion thereafter in accordance with the provisions of the Contract Documents.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 If the Contractor is delayed at any time in the progress of the Work by any act or neglect of the Owner or Engineer or by any employee of the Owner or Engineer, or by any separate contractor employed by the Owner or Engineer, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in transportation, adverse weather conditions not reasonably anticipated, unavoidable casualties, or any causes beyond the Contractor's or its Subcontractor's control, or by delay authorized by the Owner, then, provided such delay in no way results from the act or neglect of the Contractor or any of its Subcontractors, the Contract Time shall be extended by Change Order for such reasonable time as the Owner may determine.

8.3.2 Any claim for extension of time shall be made in writing to the Owner not more than seven (7) days after the commencement of the delay; otherwise it shall be waived. In the case of a continuing delay only one claim is necessary. The Contractor shall provide an estimate of the probable effect of such delay on the progress of the Work.

8.3.3 If no agreement is made stating the dates upon which interpretations shall be furnished, then no claim for delay shall be allowed on account of failure to furnish such interpretation until fifteen days after written request is made for them, and not then unless such claim is reasonable.

8.4 LIQUIDATED DAMAGES (No liquidated Damages Apply)

~~8.4.1 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 Owner, then the Contractor does hereby agree, as a part consideration for the awarding of this Contract, to pay to the Owner 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 Contract 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 Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of~~

~~damages which the Owner would sustain and said amount shall be retained from time to time by the Owner from current periodical estimates.~~

8.4.2 It is further agreed that time is of the essence of each and every portion of this Contract and of the specifications wherein as definite and certain length of times if 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.

8.4.3 Provided, that the contractor shall not be charged with liquidated damages or any excess cost when the Owner determines that the Contractor is without fault and the Contractor's reasons for the time extension are acceptable to the Owner; Provided, further, that the Contractor shall not be charged with liquidated damages or any excess cost when the delay in completion of the work is due:

1. To any preference, priority or allocation order duly issued by the Government;
2. To unforeseeable cause beyond the control and without the fault of negligence of the Contractor, including, but not restricted to, acts of God, or of the public enemy, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and severe weather; and
3. To any delays of subcontractors or suppliers occasioned by any of the causes specified in subsection (1.) and (2.) of this article:

8.4.4 Provided, further, that the Contractor shall, within ten (10) days from the beginning of such delay, unless the Owner shall grant a further period of time prior to the date of final settlement of the Contract, notify the Owner, in writing, of the causes of the delay, who shall ascertain the facts and extent of the delay and notify the Contractor within a reasonable time of its decision in the matter.

ARTICLE 9

PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

9.1.1 The Contract Sum is stated in the Owner-Contractor Agreement and, including authorized adjustments thereto, is the total amount payable by the Owner to the Contractor for the performance of the Work under the Contract Documents.

9.2 SCHEDULE OF VALUES

9.2.1 Before the first Application for Payment, the Contractor shall submit to the Owner a schedule of values allocated to the various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Owner may require. This schedule, unless objected to by the Owner, shall be used only as a basis for the Contractor's Application for Payment.

9.3 APPLICATIONS FOR PAYMENT

9.3.1 The Contractor shall submit to the Owner an itemized Application for Payment supported by such data substantiating the Contractor's right to payment as provided elsewhere in the Contract Documents for the period ending the 25th day of each month within the Contract period.

9.3.2 Unless otherwise provided in the Contract Documents, payments will be made on account of materials or equipment not incorporated in the Work but delivered and suitably stored at the site and, if approved in advance by the Owner, payments may similarly be made for materials or equipment suitably stored at some other location agreed upon in writing. Payments for materials or equipment stored on or off the site shall be conditioned upon submission by the Contractor of bills of sale or such other procedures satisfactory to the Owner to establish the Owner's title to such materials or equipment or otherwise protect the Owner's interest, including applicable insurance and transportation to the site for those materials and equipment stored off the site. The Contractor shall assume responsibility to protect all such materials from loss or

damage at no cost to the Owner, until they are finally incorporated into the Work, whether or not they have been paid for by the Owner.

9.3.3 The Contractor warrants that title to all Work, materials and equipment covered by an Application for Payment will pass to the Owner either by incorporation in the construction or upon the receipt of payment by the Contractor, whichever occurs first, free and clear of all liens, claims, security interests or encumbrances, hereinafter referred to in this Article 9 as "liens"; 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 Work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.

9.4 CERTIFICATES OF PAYMENT

9.4.1 The Owner will, within ten days after the receipt of the Contractor's Application for Payment, issue a Certificate for Payment to the Contractor for such amount as the Owner determines is properly due, or notify the Contractor in writing his reasons for withholding a Certificate as provided in Subparagraph 9.6.1.

9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Owner, based on its observations at the site as provided in Subparagraph 3.2.7 and the data comprising the application for Payment, that the Work has progressed to the point indicated; that, to the best of his knowledge, information and belief, the quality of Work is in accordance with the Contract Documents (subject to an evaluation of the Work for conformance with the Contract Document upon Substantial Completion, to the results of any subsequent tests required by or performed under the Contract Documents correctable prior to completion, and to any specific qualifications stated in his Certificate); and that the Contractor is entitled to payment in the amount certified. However, by issuing a Certificate for Payment, the Owner shall not thereby be deemed to represent that he has made exhaustive or continuous on-site inspections to check the quality or quantity of the Work or that he has reviewed the construction means, methods,

techniques, sequences or procedures, or that he has made any examination to ascertain how or for what purpose the Contractor has used the moneys previously paid on account of the Contract Sum.

9.5 PROGRESS PAYMENTS

9.5.1 After the Owner has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents. The Owner reserves the right to a 5% general retainage from each progress payment, which retainage shall be released to the Contractor upon substantial completion.

9.5.2 The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's Work, the amount to which said Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contractor on account of such Subcontractor's Work. The Contractor shall, by an appropriate agreement with each Subcontractor, require each Subcontractor to make payments to his Sub-subcontractors in similar manner.

9.5.3 The Owner may, on request and at his discretion, furnish to any Subcontractor, if practicable, information regarding the percentages of completion or the amounts applied for by the Contractor and the action taken thereon by the Owner on account of Work done by such Subcontractor.

9.5.4 The Owner shall not have any obligation to pay or to see to the payment of any moneys to any Subcontractor except as may otherwise be required by law.

9.5.5 No Certificate for a progress payment, nor any progress payment, nor any partial or entire use or occupancy of the Project by the Owner, shall constitute an acceptance of any Work not in accordance with the Contract Documents.

9.6 PAYMENTS WITHHELD

9.6.1 The Owner shall decline to certify payment and withhold its Certificate in whole or in part, to the extent necessary reasonably to protect itself. If the Owner is unable to certify payment in the amount of the Application, he will notify the Contractor as provided in

Subparagraph 9.4.1. If the Contractor and the Owner cannot agree on a revised amount, the Owner will promptly issue a Certificate for Payment for the amount for which it determines is properly due. The Owner may also decline to certify payment or, because of subsequently discovered evidence or subsequent observations, it may nullify the whole or any part of any Certificate for Payment previously issued, to such extent as may be necessary in its opinion to protect itself from loss because of:

1. Defective work not remedied,
2. Third party claims filed or reasonable evidence indicating probable filing of such claims,
3. Failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment,
4. Reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum,
5. Damage to the Owner or another Contractor,
6. Reasonable evidence that the Work will not be completed within the Contract Time, or material failure to carry out the Work in accordance with the Contract Documents.

9.6.2 When the above grounds in Subparagraph 9.6.1 are removed, payment shall be made for amounts withheld because of them.

9.7 FAILURE OF PAYMENT

9.7.1 If the Owner does not issue a Certificate for Payment, through no fault of the Contractor, within ten days after receipt of the Contractor's Application for Payment, then the Contractor may, upon ten additional days' written notice to the Owner, stop the Work until payment of the amount owing has been received. The Contract Sum shall be increased by the amount of the Contractor's reasonable and justifiable costs of shut-down, delay and start-up, which shall be effected by appropriate Change order in accordance with Paragraph 12.3.

9.8 SUBSTANTIAL COMPLETION

9.8.1 When the Contractor considers that the Work, or a designated portion thereof which is acceptable to the Owner, is substantially complete as defined in Subparagraph 8.1.3, the Contractor shall prepare for submission to the Owner a list of items to be completed or corrected. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all work in accordance with the Contract Documents. When the Owner on the basis of an inspection determines that the Work or designated portion thereof is substantially complete, he will then prepare for a Certificate of Substantial Completion which shall establish the Date of Substantial Completion, shall state the responsibilities of the Owner and the Contractor for security, maintenance, heat, utilities, damage to the Work, and insurance, and shall fix the time within which the Contractor shall complete the items listed therein. 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 Certificate of Substantial Completion shall be submitted to the Owner and the Contractor for their written acceptance of the responsibility assigned to them in such Certificate.

9.8.2 Upon Substantial Completion of the Work or designated portion thereof and upon application by the Contractor and Certification by the Owner, the Owner shall make payment, reflecting adjustment in retainage, if any, for such Work or portion thereof, as provided in the Contract Documents.

9.9 FINAL COMPLETION AND FINAL PAYMENT

9.9.1 Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Owner will promptly make such inspection and, when it finds the Work acceptable under the Contract Documents and the Contract fully performed, it will promptly issue a final Certificate for Payment stating that to the best of its knowledge, information and belief, and on the basis of its observations and inspections, the Work has been completed in accordance with the terms and conditions of the

Contract Documents and that the entire balance found to be due the Contractor, and noted in said final Certificate, is due and payable. The Owner's final Certificate for Payment will constitute a further representation that the conditions precedent to the Contractor's being entitled to final payment as set forth in Subparagraph 9.9.2 have been fulfilled.

9.9.2 Neither the final payment nor the remaining retained percentage shall become due until the Contractor submits to the Owner (1) an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or his property might in any way be responsible, have been fully paid or otherwise satisfied, (2) consent of surety, if any, to final payment and (3), if required by the Owner, other data establishing payment or satisfaction of all such obligations, such as the written document described in Paragraph 13.2.2, receipts, releases and waivers of liens arising out of the Contract, to the extent and in such form as may be designated by the Owner. If any Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify him against any such lien. If any such lien remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

9.9.3 If, after Substantial Completion of the Work, final completion thereof is delayed for more than ninety (90) days through no fault of the Contractor or by the issuance of Change Orders affecting final completion, the Owner shall, upon application by the Contractor, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted, provided that the remaining balance for Work not fully completed or corrected shall not be less than the retainage stipulated in the Contract Documents, and if bonds have been furnished as provided in Paragraph 7.5, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Owner prior to certification of such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

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

1. Unsettled liens,
2. Faulty or defective Work appearing after Substantial Completion,
3. Failure of the Work to comply with the requirements of the Contract Documents, or
4. Terms of any special warranties required by the Contract Documents.
5. Obligations under the Performance and Payment Bonds.

9.9.5 The acceptance of final payment shall constitute a waiver of all claims by the Contractor except those previously made in writing and identified by the Contractor as unsettled prior to the time of the final Application for Payment.

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work.

10.2 SAFETY OF PERSONS AND PROPERTY

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

1. All employees on the Work and all other persons who may be affected thereby;
2. All the Work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor or any of his Subcontractors or Sub-subcontractors; and
3. Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

10.2.2 The Contractor shall give all notices and comply with all applicable laws, ordinances, rules, regulations and orders of any public authority bearing on the safety of persons or property or their protection from damage, injury or loss.

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

10.2.4 When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

10.2.5 The Contractor shall promptly remedy all damage or loss to any property referred to in Clauses 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, any Subcontractor, any Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable and for which the Contractor is responsible under Clauses 10.2.1.2 and 10.2.1.3, except damage or loss solely attributable to the acts or omissions of the Owner, the Engineer or anyone directly or indirectly employed by the Owner or Engineer, or by anyone for whose acts the Owner or Engineer may be liable, and not attributable to the acts or omissions of the Owner, the Engineer or anyone directly or indirectly employed by them, or by anyone for whose acts it may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to his obligation under Paragraph 4.13.

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

10.2.7 The Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.

10.3 EMERGENCIES

10.3.1 In any emergency affecting the safety of persons or property, the Contractor shall act, at his discretion, to prevent threatened damage, injury or loss. Any additional compensation or extension of time claimed by the Contractor on account of emergency work shall be determined as provided in Article 12 for Changes in the Work.

ARTICLE 11

INSURANCE

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.1 The Contractor shall purchase and maintain such insurance as will protect him and the Owner from claims set forth below which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

1. Claims under workers' or workmen's compensation, disability benefit and other similar employees benefit acts;
2. Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;
3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;
4. Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person;
5. Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom; and
6. Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

11.1.2 The insurance required by Subparagraph 11.1.1 shall be written for not less than any limits of liability specified in the Contract Documents, or required by law, whichever is greater.

11.1.3 The insurance required by Subparagraph 11.1.1 shall include contractual liability insurance applicable to the Contractor's obligations under Paragraph 4.18.

11.1.4 Certificates of Insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. These Certificates shall contain a provision that coverages afforded under the policies will not be cancelled until at least thirty days prior written notice has been given to the Owner. Certificates of renewal shall be delivered to the Owner at least fifteen (15) days prior to the expiration date of any insurance policy. The Contractor shall not commence the Work until all insurance required hereunder shall have been obtained and approved by the Owner, and the Contractor shall not permit any Subcontractor or Sub-subcontractor to commence work until all insurance required of them shall have been similarly obtained and approved.

11.2 OWNER'S LIABILITY INSURANCE (NOT REQUIRED THIS CONTRACT)

11.2.1 The Owner, at its option, may purchase and maintain such insurance as will protect it against claims which may arise from operations under the Contract.

11.3 PROPERTY INSURANCE (NOT REQUIRED THIS CONTRACT)

11.3.1 The Owner may, at its option, purchase and/or maintain property insurance upon the entire Work at the site to the full insurable value thereof. This insurance shall include the interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Work and shall insure against the perils of fire and extended coverage and shall include "all risk" insurance for physical loss or damage including, without duplication of coverage, theft, vandalism and malicious mischief. If the Owner does not intend to purchase or maintain such insurance for the full insurable value of the entire Work, he shall inform the Contractor in writing prior to commencement of the Work. The Contractor may then affect insurance which will protect the interests of himself, his Subcontractors and the Sub-subcontractors in the Work, and by

appropriate Change Order the cost thereof shall be charged to the Owner. If not covered under the all risk insurance or otherwise provided in the Contract Documents, the Contractor shall effect and maintain property insurance on portions of the Work stored off the site or in transit when such portions of the Work are to be included in an Application for Payment under Subparagraph 9.3.2. This insurance does not cover any tools owned by mechanics, any tools, equipment, scaffolding, staging towers, and other property owned or rented by the Contractor, the capital value of which is not included in the cost of the Work.

11.3.2 The Owner and Contractor waive all rights against (1) each other and the Subcontractors, Sub-subcontractors, agents and employees each of the other, and (2) separate contractors, if any, and their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other perils to the extent covered by insurance obtained pursuant to this Paragraph 11.3 or any other property insurance held by the Owner as trustee. The Owner or the Contractor, as appropriate, shall require of separate contractors, Subcontractors and Sub-subcontractors by appropriate agreements, written where legally required for validity, similar waivers each in favor of all other parties enumerated in this Subparagraph 11.3.2.

11.3.3 The Owner as trustee shall have power to adjust and settle any loss with the insurers.

11.3.4 The construction site may be occupied by the Owner during the Work. Insurance shall not lapse or be cancelled on account of this occupancy. The insurance certificates required under this contract shall include this requirement.

11.4 LOSS OF USE INSURANCE (NOT REQUIRED THIS CONTRACT)

11.4.1 The Owner, at his option, may purchase and maintain such insurance as will insure him against loss of use of his property due to fire or other hazards, however caused.

ARTICLE 12

CHANGES IN THE WORK

12.1 CHANGE ORDER

12.1.1 A Change Order is a written order to the Contractor signed by the Owner, issued after execution of the Contract, authorizing a change in the Work or an adjustment in the Contract Sum or the Contract Time. The Contract Sum and the Contract Time may be changed only by Change Order.

12.1.2 The Owner, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and the Contract Time being adjusted accordingly. All such changes in the Work shall be authorized by Change Order, and shall be performed under the applicable conditions of the Contract Documents.

12.1.3 The cost or credit to the Owner resulting from a change in the Work shall be determined in one or more of the following ways:

1. By mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
2. By unit prices stated in the Contract Documents or subsequently agreed upon;
3. By cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
4. By the method provided in Subparagraph 12.1.4.

12.1.4 If none of the methods set forth in Clauses 12.1.3.1, 12.1.3.2 or 12.1.3.3 is agreed upon, the Contractor, provided he receives a written order signed by the Owner, shall promptly proceed with the Work involved. The cost of such Work shall then be determined by the Owner on the basis of the reasonable expenditures and savings of those performing the Work attributable to the change, including, in the case of an increase in the Contract Sum, a reasonable allowance for overhead and profit. In such case, and also under Clauses 12.1.3.3 and 12.1.3.4

above, the Contractor shall keep and present an itemized accounting together with appropriate supporting data for inclusion in a Change Order. Unless otherwise provided in the Contract Documents, cost shall be limited to the following: actual cost of materials, including sales tax and cost of delivery; labor, including social security, old age and unemployment insurance, and fringe benefits required by agreement or custom; workers' or workmen's compensation insurance; bond premiums, rental value of equipment and machinery; and the additional costs of supervision and field office personnel directly attributable to the change. Pending final determination of cost to the Owner, payments on account shall be made on the Owner's Certificate for Payment. The amount of credit to be allowed by the Contractor to the Owner for any deletion or change which results in a net decrease in the Contract Sum will be the amount of the actual net cost. When both additions and credits covering related Work or substitutions are involved in any one change, the allowance for overhead and profit shall be figured on the basis of the net increase, if any, with respect to that change.

12.1.5 Unit prices are stated in the Bid Form and the Contract shall include all costs of the Contractor to the Owner as listed in Paragraph 12.1.4. No additional charges shall be allowed for these items under any circumstances.

12.2 CONCEALED CONDITIONS

12.2.1 Should concealed conditions encountered in the performance of the Work below the surface of the ground or should concealed or unknown conditions in an existing structure be at variance with the conditions indicated by the Contract Documents, or should unknown physical conditions below the surface of the ground or should concealed or unknown conditions in an existing structure of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in his Contract, be encountered, the Contract Sum shall be equitably adjusted by Change Order upon claim by either party made within twenty days after the first observance of the conditions.

12.3 CLAIMS FOR ADDITIONAL COST

12.3.1 If the Contractor wishes to make a claim for an increase in the Contract Sum, he shall give the Owner written notice thereof within twenty days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the Work, except in an emergency endangering life or property in which case the Contractor shall proceed in accordance with Paragraph 10.3. No such claim shall be valid unless so made. Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.

12.3.2 If the Contractor claims that additional cost is involved because of, but not limited to, (1) any written interpretation by the Owner or Engineer, (2) any order by the Owner to stop the Work pursuant to Paragraph 3.3 where the Contractor was not at fault, (3) any written order for a minor change in the Work issued pursuant to Paragraph 12.4, or (4) failure of payment by the Owner pursuant to Paragraph 9.7, the Contractor shall make such claim as provided in Subparagraph 12.3.1.

12.4 MINOR CHANGES IN THE WORK

12.4.1 The Owner and Engineer will have authority to order minor changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be affected by written order, and shall be binding on the Owner, Engineer and the Contractor. The Contractor shall carry out such written orders promptly.

ARTICLE 13

UNCOVERING AND CORRECTION OF WORK

13.1 UNCOVERING OF WORK

13.1.1 If any portion of the work should be covered contrary to the request of the Owner or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Owner, be uncovered for his observation and shall be replaced at the Contractor's expense.

13.1.2 If any other portion of the Work has been covered which the Owner has not specifically requested to observe prior to being covered, the Owner may request to see such Work and it shall be uncovered by the Contractor. If such Work be found in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such Work be found not in accordance with the Contract Documents, the Contractor shall pay such costs unless it be found that this condition was caused by the Owner or a separate contractor as provided in Article 6, in which event the Owner shall be responsible for the payment of such costs.

13.2 CORRECTION OF WORK

13.2.1 The Contractor shall promptly correct all Work rejected by the Owner or Engineer as defective or as failing to conform to the Contract Documents whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected Work, including compensation for the Owner's additional services made necessary thereby.

13.2.2 The Contractor shall provide a document to the Owner certifying that if within one year after the Date of Substantial Completion of the Work or designated portion thereof or within one year after acceptance by the Owner of designated equipment or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be defective or requiring excessive service or maintenance or not in accordance with the Contract Documents, the Contractor shall correct it within seven (7) days after receipt of a written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such approval, which written acceptance shall specifically refer to such defect. This obligation shall survive termination of the Contract. The Owner shall give such notice promptly after discovery of the condition. The provisions of this paragraph are in addition to, and not in limitation of, the Owner's other rights and remedies hereunder and in law and equity.

13.2.3 The Contractor shall remove from the site all portions of the Work which are defective or non-conforming and which have not been corrected under Subparagraph 4.5.1, 13.2.1 and 13.2.2, unless removal is waived by the Owner in writing.

13.2.4 If the Contractor fails to correct defective or nonconforming Work as provided in Subparagraphs 4.3.1, 12.2.1 and 13.2.2. The Owner may correct it in accordance with Paragraph 3.4.

13.2.5 If the Contractor does not proceed with the correction of such defective or non-conforming Work within a reasonable time fixed by written notice from the Owner, the Owner may remove it and may store the materials or equipment at the expense of the Contractor. If the Contractor does not pay the cost of such removal and storage within ten days thereafter, the Owner may upon ten additional days' written notice sell such Work at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs that should have been borne by the Contractor, including compensation for the Owner's additional services made necessary thereby. If such proceeds of sale do not cover all costs which the Contractor should have borne, the difference shall be charged to the Contractor and an appropriate Change Order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

13.2.6 The Contractor shall bear the cost of making good all work of the Owner or separate contractors destroyed or damaged by such correction or removal.

13.2.7 Nothing contained in this Paragraph 13.2 shall be construed to establish a period of limitation with respect to any other obligation which the Contractor might have under the Contract Documents, including Paragraph 4.5 hereof. The establishment of the time period of one year after the Date of Substantial Completion or such longer period of time as may be prescribed by law or by the terms of any warranty required by the Contract Documents relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which his obligation to comply with the Contract Documents may be sought to

be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to his obligation other than specifically to correct the Work.

13.3 ACCEPTANCE OF DEFECTIVE OR NON-CONFORMING WORK

13.3.1 If the Owner prefers to accept defective or nonconforming Work, he may do so instead of requiring its removal and correction, in which case a Change Order will be issued to reflect a reduction in the Contract Sum where appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 14

TERMINATION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR

14.1.1 If the Work is stopped for a period of ninety (90) days under an order of any court or other public authority having jurisdiction, or as a result of an act of government, such as a decision of a national emergency making materials unavailable, through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing any of the Work under a contract with the Contractor, or if the Work should be stopped for a period of thirty days by the Contractor because the Owner has not issued a Certificate for Payment as provided in Paragraph 9.7 or because the Owner unjustifiably has not made payment thereon as provided in Paragraph 9.7, then the Contractor may, upon seven additional days written notice to the Owner, terminate the Contract and recover from the Owner payment for all Work executed and for any proven loss sustained upon any materials, equipment, tools, construction equipment and machinery, including reasonable profit and damages.

14.2 TERMINATION BY THE OWNER

14.2.1 To the extent permitted by law, if the Contractor is adjudged a bankrupt, or if he makes a general assignment for the benefit of his creditors, or if a receiver is appointed on account of his insolvency, or if he refuses or fails, repeatedly except in cases for which extension

of time is provided, to supply enough properly skilled workmen or proper materials, or if he fails to make prompt proper payment to Subcontractors for materials or labor, or disregards laws, ordinances, rules, regulations or order of any public authority having jurisdiction, or otherwise fails to comply with any provision of the Contract Documents, then the Owner may, without prejudice to any right or remedy and after giving the Contractor and his surety, if any, seven days' written notice, terminate the employment of the Contractor and take possession of the site and of all materials, equipment, tools, construction equipment and machinery thereon owned by the Contractor and may finish the Work by whatever method he may deem expedient.

14.2.2 If the unpaid balance of the Contract Sum exceeds the costs of finishing the Work, including compensation for the Owner's additional services made necessary thereby, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The obligation to pay said amount to the Contractor or to the Owner, as the case may be, shall survive the termination of the Contract.

Section 00750

TERMS and CONDITIONS

These TERMS and CONDITIONS shall apply to all Contracts with the City of Woburn.

- 1. BID OFFERS.** The right is reserved to reject any and all bids or parts of bids and to make an award as may be determined to be in the best interests of the City of Woburn. Bids not submitted in triplicate will be rejected. Bids with erasures/alterations will be rejected.
- 2. PRICES** quoted must be F.O.B. Delivered Destination-Woburn, MA. No charges will be allowed for packing, crating, freight, handling, or cartage unless specifically stated and included with bid.
- 3. AWARDS** to a bidder may be cancelled if the bidder shall fail to prosecute the work with promptness and diligence.
- 4. PAYMENT.** The City of Woburn shall make no payment for a supply or service rendered prior to execution of a written Contract. Bills for services, materials, or supplies furnished by bidders under Contract should be submitted before the first day of the in which payment is to be made to insure payment by twentieth day of that month, except where the allowance for a discount differs from the above. Contractor agrees to submit bills and delivery slips to the City Department in sufficient time for such discounts to be taken advantage of by the City and, in any event, shall not be less than ten (10) days from the submission to the Department of such bills and delivery slips. Time in connection with a discount offered will be computed from the date of delivery to the City, as specified on the order or from the date a correct invoice is received by the using agency of the City, if the latter date is later than the date of delivery.
- 5. GUARANTEES.** The successful bidder shall repair, replace, or make good, without cost to the City, any defects or faults arising within one (1) year after the date of acceptance of articles furnished hereunder resulting from imperfect or defective work done or materials furnished by the Seller.
- 6. PATENTS.** The Seller shall indemnify and save harmless the City and all persons acting for or on behalf of it from all suits and claims against them, or any of them, arising from or occasioned by the use of any material, equipment, or apparatus, or any part thereof, which infringes or is alleged to infringe on any patent rights. In case such material, equipment, or apparatus, or any part thereof, in any such suit is held to constitute an infringement, the Seller within a reasonable time, will, at its expense and as the City may elect, replace such material, equipment, or apparatus, or remove the material, equipment, or apparatus and refund the sums paid.
- 7. LEGALITY.** The successful bidder shall comply with all applicable United States, Massachusetts, and/or City of Woburn codes, statutes, ordinances, rules, and regulations.
- 8. TAXES.** Purchases made by the City are exempt from Massachusetts Sales Tax and Federal Excise Taxes. Bid prices must exclude any such taxes. Exemption certificates will be furnished upon request.

9. BONDS. If this Invitation requires bid surety, the surety shall be in the form of bid bond of a MA Licensed Company, certified check, bank check, money order from a responsible bank, made payable to City of Woburn and must be filed with the original bid at the Office of the Purchasing Agent. Failure to submit surety will cause the bid to be rejected. The bid surety will be returned to the successful bidder within seven (7) days after the execution of the awarded contract and approval by the City of the performance bond. In the case of a default, the bid surety shall be forfeited to the City of Woburn. The successful bidder may be required to furnish a performance bond in an amount and with a MA licensed Surety satisfactory to the City. The Contractor will assume all costs for bonds.

10. ORDERS. Verbal Orders are not binding on the City of Woburn, and any delivery made or work performed without written order or written Contract are at the risk of the Seller or Contractor and may result in an unenforceable claim. The actual needs of City Departments shall govern the actual amount delivered under Contract to be drawn and entered into between the successful bidder and the City. Purchase Orders issued by the City to pay for goods or services shall be made part of Contract.

11. INDEMNITY. Contractor shall agree to Indemnify, Defend, and Hold the City Harmless from any and all claims arising out of the performance of this contract from the negligence, willful acts or omissions of the contractor, its employees, agents, or any sub-contractors.

12. EQUALITY. Where trade names or specific manufacturers are mentioned in the specifications, the City does not intend to limit competition, but merely to indicate the general type of commodity to be supplied. The City invites offers on comparable commodities to those named or described in the specification. Naming of any commercial name, trademark or other identifier shall not be construed to exclude any item or manufacturer not mentioned by name or as limiting competition, but shall establish a standard of equality only. An item shall be considered equal to the item so named or described if:(a)it is at least equal in quality, durability, appearance, strength, and design;(b)it will perform at least equally the function imposed by the general design for the purpose being contracted for or the material being purchased; and(c)it conforms in a substantial way, even with deviations, to the detailed requirements for the item in the specifications. The name and identification of all materials, other than the one named, shall be submitted to the City in writing for approval, prior to the purchase, use, or fabrication of such items. Subject to the provisions of M.G.L., Ch.30,s.39J, or other applicable statute, approval shall be at the sole discretion of the City, it shall be in writing to be effective, and the decision of the City shall be final. The City may require tests of all materials so submitted to establish quality standards at the vendor's expense. All directions, specifications, and advice by the manufacturer for the proper installation, handling, storage, adjustment, or operation of their equipment shall be complied with and the responsibility for the proper performance shall continue to rest with the vendor. Include a written brochure outlining all features of the product offered whenever possible.

13. MINORITY BUSINESS ENTERPRISE PLAN - Pursuant to M.G.L. c 7, §40N and M.G.L. c. 7, §61, the Supplier Diversity Office (“SDO”) (formerly SOMWBA) and the Division of Capital Asset Management (“DCAM”) have set revised participation goals for Minority Business Enterprise (“MBE”) and Women Business Enterprise (“WBE”) participation for affected state funded building projects and state assisted municipal building projects as defined in the above referenced laws and related Executive Orders, including Executive Orders 524 and 526.

Effective January 1, 2012, and until such time as the goals may be revised, the MBE and WBE participation goals for building construction and design awards and expenditures on new projects advertised on or after the effective date will be a combined MBE/WBE goal as follows:

10.4% combined MBE/WBE participation on construction contract awards; and,
17.9% combined MBE/WBE participation on design contract awards.

Overall annual designations by awarding authorities, as well as MBE/WBE participation on individual projects with a combined MBE/WBE participation goal, must include a reasonable representation of both MBE and WBE firms that meets or exceeds the combined goal. Proposed MBE/WBE participation plans that include solely MBE or solely WBE participation, or do not include a reasonable amount of participation by both MBE and WBE firms to meet the combined goal, will not be considered responsive. Where the prime contractor or designer is an SDO certified MBE or WBE, the prime must bring a reasonable amount of participation by a firm or firms that hold the certification which is not held by the prime contractor or designer on the project. Proposed participation on construction projects or design projects which consists solely of either an MBE or WBE representing 100% of the overall combined goal will not be considered reasonable participation.

The SDO and DCAM will determine whether there is reasonable participation by both MBE and WBE firms on individual projects under their respective oversight. Firms submitting MBE/WBE participation plans which do not provide reasonable participation by both MBE/WBE firms shall be provided an opportunity to revise and resubmit their plans within the time frame set by the awarding authority; however no price adjustments shall be permitted as a result of the revised plan. Firms failing to submit an MBE/WBE participation plan deemed reasonable and accepted by the awarding authority shall not be awarded the contract.

Participation by MBE and WBE firms must be documented, tracked and reported on separately as MBE participation and WBE participation by prime vendors, subcontractors and awarding authorities.

14. RIGHT TO KNOW LEGISLATION, M.G.L., Ch.111F and 454 CMR 21.06

All vendors furnishing substances or mixtures which may be classified as toxic or hazardous, pursuant to MGL,Ch.111F , are cautioned to obtain and read the Law and the Regulations referred to above. Copies may be obtained from the State House Bookstore, State House, Room 117, Boston, MA 02133 for a fee.

15. NON-COLLUSION AFFIDAVIT, M.G.L., Ch.30, s.39M and/or Ch.30B, s. 10

Any person submitting a bid or proposal for the procurement or disposal of supplies or services to any governmental body shall certify in writing on the bid or proposal, as follows: the undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club or other organization, entity, or group of individuals.

16. STATE TAXES PAID: Pursuant to M.G. L. Ch.62C, s.49A, the undersigned certifies that, to the best of their knowledge and belief, they have complied with all the laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting of child

support.

17. BID OFFERS will be reviewed and awards made as soon as is possible. Awards will be made within 30 business days from Bid Opening or will be rejected. Offers must be signed to be valid.

18. UNIT PRICE. The case of arithmetical error in any offer involving extension of prices quoted herein, the unit price will govern the final price of quantities offered.

19.INSURANCE.Contractor shall purchase and maintain coverage for Workers' Compensation, Comprehensive General Liability, including products, completed operations, and contractual liability; Automobile Liability to protect their employees and others from bodily injury and damages to property which may arise out of or result from the Contractor's operations under this agreement, whether such operations be the Contractor's, any subcontractor, or anyone directly or indirectly employed by any of them. This insurance shall be in limits specified by Law, or as specified in the specifications. **In no case shall the limits be less than \$ 1,000,000 in Bodily Injury and in Property Damages.** A certificate of insurance naming the City of Woburn as Additional Named Insured shall be filed with the City prior to the commencement of any contract's operations. All policies and certificates shall contain an endorsement requiring at least thirty (30) days written notice, non-renewal or cancellation of coverage to City of Woburn. Compliance by the Contractor with the insurance requirements shall not relieve the Contractor from liability under the full indemnity provisions contained herein (see 11).

20. INDEPENDENT CONTRACTOR. The contractor is neither an agent nor an employee of the City of Woburn and is not authorized to act in behalf of the City of Woburn.

21. COMPLETE AGREEMENT. The written contract supersedes all prior agreements or understandings between the parties and shall not be changed unless mutually agreed by both parties in writing.

22. ASSIGNMENT / SUB-CONTRACTING. The Contractor shall not assign any interest in a contract nor engage any other entity, company, subcontractor or individual to perform any obligation to the City without prior written consent of the City of Woburn.

23. CONFLICT OF INTEREST. The bidder certifies that no official or employee of the City of Woburn has a financial interest in this offer or in the contract which the bidder offers to execute or in the expected profit to arise there from, unless there has been compliance with the provisions of M.G.L.,Ch.43, s.27 (Interest in Public Contracts by Public Employees) and of provisions of M.G.L.,Ch.268A,s.20 (Conflict of Interest Law) and that this offer is made in good faith without fraud or collusion or connection with any other person submitting an offer to the City of Woburn.

24. TERMINATION. The City of Woburn shall have the Right to terminate this Agreement, if:(A) the Contractor neglects or fails to perform or observe any of its obligations hereunder and cure is not affected by the Contractor within Fifteen (15) Days next following its receipt of a termination notice issued by the City of Woburn, or,(B)a judgment or decree is entered against the Contractor approving a petition for arrangement, liquidation, dissolution or similar relief relating to any bankruptcy or insolvency and such judgment or decree remains unvacated for Thirty (30) Days; or Immediately, if Contractor shall file a voluntary petition in bankruptcy or any petition or answer seeking any arrangement, liquidation or dissolution relating to bankruptcy, insolvency or

other relief of debtors, or shall seek or consent or acquiesce in appointment of any trustee, receiver or liquidation of Contractor's property; or (C) funds are not appropriated or otherwise made available to support continuation of performance in any Fiscal Year succeeding the first year of this Agreement. City of Woburn shall pay all reasonable and supportable costs incurred prior to termination which payment shall not exceed the value of any services provided. **NOTICE:** The City of Woburn may terminate this Contract or any Purchase Order issued hereunder **without cause** at anytime, effective upon the termination date stated in the notice of termination. The Contractor shall cease performance upon the stated termination date. If the Contract or any Purchase Order is terminated under this subsection, the Contractor shall be entitled to be paid for supplies and/or services delivered and accepted prior to the notice of termination. In no event shall the Contractor be entitled to be paid for any supplies or services delivered after the effective date of termination.

25. RETURN OF PROPERTY. Upon termination, the Contractor shall immediately return to the City of Woburn, without limitation, all documents, plans, drawings, tools, equipment, and items of any nature whatsoever supplied to the Contractor by the City, or items developed by the Contractor in accordance with the terms of a Contract with the City of Woburn.

26. INTERPRETATION OF SPECIFICATIONS. Any prospective bidder that requests an interpretation of existing specifications' terms or conditions must do so within five (5) working days before the scheduled bid opening. All requests shall be in writing to the Purchasing Agent.

27. INFORMATION. The submission of a bid offer authorizes the City to contact any and all parties referenced by the bidder in regard to financial and operational information. The City shall have the right to request verification of any information or qualifications submitted as part of any offer to the City.

28. PRICE REDUCTION. It is understood and agreed that should any price reductions occur between the opening of the bid offers and the completion of the delivery of goods or services that the benefit of all such reductions will be extended to City.

29. GOVERNING LAW. The offer and any Contract which may ensue shall be governed by the Laws of the Commonwealth of Massachusetts.

30. ENFORCEABILITY. In the event that any provision of this offer or Contract is found to be legally unenforceable, such legal unenforceability shall not prevent enforcement of any other provisions of a Contract.

31. SAMPLES. Any qualified bidder may be required to submit samples of the goods offered at the request of the Purchasing Agent. Evaluation for acceptability will be a determining factor in the selection process.

32. DISCRIMINATION. It is understood and agreed that it shall be a material breach of Contract resulting from this bid offer for the Contractor to engage in any practice which shall violate any provision of M.G.L., Ch.151B, relative to discrimination in hiring, discharge, or, terms or conditions of employment.

CERTIFICATIONS

Statements below shall be submitted with each Bid or Proposal and shall be duly dated and signed with an **original signature** and all other information, or, the Bid or Proposal may be rejected.

In witness whereof, the undersigned certifies, under the pains and penalties of perjury that:

1. STATE TAXES PAID: Pursuant to M.G.L. Chapter 62C, s. 49A, the undersigned certifies that, to the best of my knowledge and belief, have complied with all the laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting of child support.

2. CERTIFICATE OF NON-COLLUSION: M.G.L. C. 30, s. 39M and/or C. 30B, s.10 : Any person submitting a bid or proposal for the procurement or disposal of supplies or services to any governmental body shall certify in writing, on the bid or proposal, as follows: The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club or other organization, entity, or group of individuals.

3. PUBLIC CONTRACTS - DEBARMENT: M.G.L. C. 550, Acts of 1991: The undersigned certifies that the said "person" is not presently debarred from doing public construction work in the Commonwealth of Massachusetts under the provisions of C. 29, s. 29F, or any other applicable debarment provision of any other Chapter of the General Laws, or any Rule or Regulation promulgated thereunder. Additionally, the undersigned is not presently debarred by any Agency of the Federal Government.

4. HEALTH & SAFETY ON PUBLIC CONSTRUCTION PROJECTS OVER \$ 10000: Chapter 306 of the Acts of 2004: The undersigned certifies that the firm is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work;(2) that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the U.S. OSHA that is at least 10 hours in duration at the time that the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and(3) that all employees to be employed in the work subject to this bid have successfully completed a course in construction safety and health approved by the U.S. OSHA that is at least 10 hours in duration.

5. COMPLIANCE: The undersigned is in compliance with all of the provisions, and shall remain in full compliance with the provisions for the life of any Contract resulting from this solicitation. That the bidder is qualified to perform any such Contract and possesses, or shall obtain, all requisite licenses and/or permits to complete performance; shall maintain all unemployment, workers' compensation, professional and personal liability insurance policies sufficient to cover its performance under any such Contract; and shall comply with relevant prevailing wage rates and employment laws. To the best of its knowledge and belief has paid all local taxes, tax titles, utilities, motor vehicle excise taxes, and water and wastewater bills in MA as required by Law.

CERTIFICATION SIGNATURES

Print Company Name _____

Circle: Corporation Partnership Individual

Authorized Signature _____

Print Name _____

Title of Person Signing Bid or Proposal _____

Date _____

Company Federal ID # or Social Security # _____

State of Incorporation _____

Approval of a Contract, or other Agreement, will not be granted unless this form is signed and fully complete.

CERTIFICATE OF AUTHORITY

At a duly authorized meeting of the Board of Directors of _____
(Name of Corporation)

held on _____ it was VOTED that:
(Date)

(Name) (Officer)

of this corporation, be and he/she hereby is authorized to submit bids and proposals, execute contracts, deeds and bonds in the name and on behalf of said corporation, and affix its corporate seal hereto; and such execution of any contract, deed or obligation in this corporation's name on its behalf by such _____ under seal of the company, shall be valid
(Officer)

and binding upon this corporation.

A True Copy,

ATTEST: _____

TITLE: _____

PLACE OF BUSINESS: _____

DATE OF THIS CERTIFICATE: _____

I hereby certify that I am the clerk of the _____
(Corporation)

that _____ is the duly elected _____ of
(Name) (Office)

said corporation, and that the above vote has not been amended or rescinded and remains in full force and effect as of the date of this contract.

(Clerk)

CORPORATE SEAL:

CERTIFICATE OF CORPORATE VOTE

The undersigned certifies under penalty of perjury that this bid is in all respects bona fide, fair, and made without collusion or fraud with any other persons. "Person" shall mean any natural person, business partnership, corporation, union, committee, club, or organization, entity, or group of individuals.

Signatures of Corporate or Company Officer

Name of Firm

Date

Pursuant to M.G.L. Ch. 62C, See 49A, I hereby certify, under pains and penalties of perjury, that _____ has complied with all laws of the Commonwealth of Massachusetts relating to taxes

Social Security of Federal
Identification Number

Signatures of Individual or Corporate Name

By: _____
Corporate Officer
(If applicable)

As directed by the Department of Revenue, any person or corporation that fails to execute the attestation clause shall not be awarded the bid. (M.G.L., Ch. 62C, See 4A.) Submission of a Social Security of Federal Identification Number is purely voluntary.

SECTION 00800

SUPPLEMENTAL GENERAL CONDITIONS

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Attachment A - Wage Rates and Certificate
of Compliance

Attachment B - (MBE/EEO/AA) Policies

1. Commonwealth of Massachusetts

1. INTRODUCTION

The following supplements modify, change, delete from or add to Section 00700 GENERAL CONDITIONS. Where any Subsection of the General Conditions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplemental General Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

2. In accordance with General Laws Chapter 149, Section 26 through 27D, the Contractor is obligated to comply with the prevailing wage rates established by the Commission of the Department of Labor and Industries for mechanics, apprentices, chauffeurs, teamsters and laborers employed on the Project. The schedule of applicable prevailing wage rates for the Project, together with a Certificate of Compliance therewith, are set forth in Attachment A herein.
3. The Insurance provisions of Article II of The General Conditions are amended by adding the following requirements:

The Contractor shall carry and continuously maintain until completion of the Contract, insurance as specified below and in such form as shall protect him performing work covered by this Contract, or the City of Woburn and its employees, agents and officials, from all claims and liability for damages for bodily injury, including accidental death, and for property damage, which may arise from operations under this Contract. The Contractor covenants and agrees to hold the City and its employees, agents and officials harmless from loss or damage due to claims for personal injury and/or property damage arising from, or in connection with operations under this Contract.

Except as otherwise stated, the amounts of such insurance shall be for each policy, not less than:

- (A) For liability for bodily injury, including accidental death, \$1,000,000 for any one person and \$1,000,000 on account of one occurrence and \$1,000,000 Aggregate Limit.
 - (B) For liability for property damage \$1,000,000 on account of any one occurrence and \$1,000,000 Aggregate Limit. Extra-territorial clause shall be included.
- 1.) Worker's Compensation insurance as required by the General Laws of the Commonwealth of Massachusetts.
 - 2.) Bodily Injury Premise-Operations, Contractor's Protective and Completed Operations Public Liability Insurance in the amounts required in (A) above.

- 3.) Property Damage Premises-Operations, Contractor's Protective and Completed Operations Public Liability Insurance in the amounts required in (B) above.
- 4.) Bodily Injury Liability Insurance covering the operation of all motor vehicles owned by the Contractor and vehicles not owned by the Contractor, while such vehicles are being operated in connection with the prosecution of the work under this Contract, in the amounts required in (A) above.
- 5.) Property Damage Liability Insurance covering the operation of all motor vehicles owned by the Contractor and vehicles not owned by the Contractor while such vehicles are being operated in connection with prosecution of the work under this Contract, in the amounts required in (B) above.
- 6.) Contractual Liability Insurance covering the liability assumed by the Contractor in the amounts required under (A) and (B) above.
- 7.) Owner's Protective Insurance secured by the Contractor on behalf of the City of Woburn which will directly protect the City and/or its employees, agents and officers from liability for bodily injuries, including accident death, in the amounts required in (A) above, and for property damage in the amounts required in (B) above.

All policies shall be so written that the Owner will be notified of cancellation or restrictive amendment at least fifteen (15) days prior to the effective date of such cancellation or amendment. A certificate from the Contractor's Insurance Carrier showing at least the coverage and limits of liability specified above and expiration date shall be filed with the Owner before operations are begun.

Such certificates shall not merely name the types of policy provided, but shall specifically refer to this Contract and shall state that such insurance is required by this Contract. The Contractor shall make no claims against the City of Woburn or its officers for any injury to any of his officers or employees or for damage to his trucks or equipment arising out of work contemplated by this Contract.

4. Modified Supplemental Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program and the Special Provisions for Participation by Minority and Women Business Enterprises.

The Contractor shall abide by the Commonwealth of Massachusetts' Modified Supplemental Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program and the Special Provisions of Participation by Minority and Women Business Enterprises, (the Program is attached in its entirety as (Attachment B.1)), as well as with all other applicable Federal, State and Local equal employment opportunity, affirmative action, minority/women's business enterprise laws, rules, regulations and policies. (See Attachment B.2).

SECTION 00850
Excerpts from Chapter 30 of the
Massachusetts General Laws

Certain excerpts from the Massachusetts General Laws are applicable to Construction contracts. Attention is directed to the following sections of Chapter 30 of the General Laws of Massachusetts as amended to date:

Section 39F. "(1) Every contract awarded pursuant to sections forty-four A to L inclusive, of chapter one hundred and forty-nine shall contain the following subparagraphs (a) through (i) and every contract awarded pursuant to section thirty-nine M of chapter thirty shall contain the following subparagraphs (a) through (h) and in each case those subparagraphs shall be binding between the general contractor and each subcontractor."

- (a) Forthwith after the general contractor receives payment on account of a periodic estimate, the general contractor shall pay to each subcontractor the amount paid for the labor performed and the materials furnished by that subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.
- (b) Not later than the sixty-fifth-day after each subcontractor substantially completes his work in accordance with the plans and specifications, the entire balance due under the subcontract less amounts retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the subcontractor; and the awarding authority shall pay that amount to the general contractor. The general contractor shall forthwith pay to the subcontractor the full amount received from the awarding authority less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.
- (c) Each payment made by the awarding authority to the general contractor pursuant to subparagraphs (a) and (b) of this paragraph for the labor performed and the materials furnished by a subcontractor shall be made to the general contractor for the account of that subcontractor; and the awarding authority shall take reasonable steps to compel the general contractor to make each such payment to each such subcontractor. If the awarding authority has received a demand for direct payment from a subcontractor for any amount which has already been included in a payment to the general contractor or which is to be included in a payment to the general contractor for payment to the subcontractor as provided in subparagraphs (a) and (b), the awarding authority shall act upon the demand as provided in this section.

- (d) If, within seventy-days after the subcontractor has substantially completed the subcontract work, the subcontractor has not received from the general contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, the subcontractor may demand direct payment of that balance from the awarding authority. The demand shall be by a sworn statement delivered to or sent by certified mail to the awarding authority, and a copy shall be delivered or sent by certified mail to the general contractor at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of completion of the subcontract work. Any demand made after substantial completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth-day after the subcontractor has substantially completed the subcontract work. Within ten-days after the subcontractor has delivered or so mailed the demand to the awarding authority and delivered or so mailed a copy to the general contractor, the general contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the awarding authority and a copy shall be delivered to or sent by certified mail to the subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor and of the amount due for each claim made by the general contractor against the subcontractor.
- (e) Within fifteen-days after receipt of the demand by the awarding authority, but in no event prior to the seventieth-day after substantial completion of the subcontract work, the awarding authority shall make direct payment to the subcontractor of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount (i) retained by the awarding authority as the estimated cost of completing the incomplete or unsatisfactory items of work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the general contractor in the sworn reply; provided, that the awarding authority shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by subparagraph (d). The awarding authority shall make further direct payments to the subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this subparagraph.
- (f) The awarding authority shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (e) in an interest-bearing joint account in the names of the general contractor and the subcontractor in a bank in Massachusetts selected by the awarding authority or agreed upon by the general contractor and the subcontractor

and shall notify the general contractor and the subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in an agreement between the general contractor and the subcontractor or as determined by decree of a court of competent jurisdiction.

- (g) All direct payments and all deductions from demands for direct payments deposited in an interest-bearing account or accounts in a bank pursuant to subparagraph (f) shall be made out of amounts payable to the general contractor at the time of receipt of a demand for direct payment from a subcontractor and out of amounts which later become payable to the general contractor and in the order of receipt of such demands from subcontractors. All direct payments shall discharge the obligation of the awarding authority to the general contractor to the extent of such payment.
- (h) The awarding authority shall deduct from payments to a general contractor amounts which, together with the deposits in interest-bearing accounts pursuant to subparagraph (f), are sufficient to satisfy all unpaid balances of demands for direct payment received from subcontractors. All such amounts shall be earmarked for such direct payments, and the subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the general contractor.
- (i) If the subcontractor does not receive payment as provided in subparagraph (a) or if the general contractor does not submit a periodic estimate for the value of the labor or materials performed or furnished by the subcontractor and the subcontractor does not receive payment for same when due less the deductions provided for in subparagraph (a), the subcontractor may demand direct payment by following the procedure in subparagraph (d) and the general contractor may file a sworn replay as provided in that same subparagraph. A demand made after the first-day of the month following that for which the subcontractor performed or furnished the labor and materials for which the subcontractor seeks payment shall be valid even if delivered or mailed prior to the time payment was due on a periodic estimate from the general contractor. Thereafter the awarding authority shall proceed as provided in subparagraph (e), (f), (g), and (h)."

Section 39G. "Upon substantial completion of the work required by a contract with the commonwealth, or any agency or political subdivision thereof, for the construction, reconstruction, alteration, remodeling, repair or improvement of public ways, including bridges and other highway structures, sewers and water mains, airports and other public works, the contractor shall present in writing to the awarding authority its certification that the work has been substantially completed. Within twenty-one-days thereafter, the awarding authority shall present to the contractor either a written declaration that the work has been substantially completed or an itemized list of incomplete or unsatisfactory work items required by the contract sufficient to demonstrate that the work has not been substantially completed. The awarding authority may include with such list a notice

setting forth a reasonable time, which shall not in any even be prior to the contract completion date, within which the contractor must achieve substantial completion of the work. In the event that the awarding authority fails to respond by presentation of a written declaration or itemized list as aforesaid, to the contractor's certificate within the twenty-one-day period, the contractor's certification shall take effect as the awarding authority's declaration that the work has been substantially completed."

"Within sixty-five-days after the effective date of a declaration of substantial completion, the awarding authority shall prepare and forthwith send to the contractor for acceptance a substantial completion estimate for the quantity and price of the work done and all but one percent retainage on that work, including the quantity, price and all but one percent retainage for the undisputed part of each work item and extra work item in dispute but excluding the disputed part thereof, less the estimated cost of completing all incomplete and unsatisfactory work items and less the total periodic payments made to date for the work. The awarding authority also shall deduct from the substantial completion estimate an amount equal to the sum of all demands for direct payment filed by subcontractors and not yet paid to subcontractors or deposited in joint accounts pursuant to section thirty-nine F, but no contract subject to said section thirty-nine F shall contain any other provisions authorizing the awarding authority to deduct any amount by virtue of claims asserted against the contract by subcontractors, material suppliers or other."

"If the awarding authority fails to prepare and send to the contractor any substantial completion estimate required by this section on or before the date hereinabove set forth, the awarding authority shall pay to the contractor interest on the amount which would have been due to the contractor pursuant to such substantial completion estimate at the rate of three percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston from such date to the date on which the awarding authority sends that substantial completion estimate to the contractor for acceptance or to the date of payment therefor, whichever occurs first. The awarding authority shall include the amount of such interest in the substantial completion estimate."

"Within fifteen-days after the effective date of the declaration of substantial completion, the awarding authority shall send to the contractor by certified mail, return receipt requested, a complete list of all incomplete or unsatisfactory work items, and, unless delayed by causes beyond his control, the contractor shall complete all such work items within forty-five-days after the receipt of such list or before the then contract completion date, whichever is later. If the contractor fails to complete such work within such time, the awarding authority may, subsequent to seven-days' written notice to the contractor by certified mail, return receipt requested, terminate the contract and complete the incomplete or unsatisfactory work items and charge the cost of same to the contractor."

"Within thirty-days after receipt by the awarding authority of a notice from the contractor stating that all of the work required by the contract has been completed, the awarding authority shall prepare and forthwith send to the contractor for acceptance a final estimate for the quantity and price of the work done and all retainage on that work less all payments made to date, unless the awarding authority's inspection shows that work items required by the contract remain incomplete or unsatisfactory, or that documentation

required by the contract has not been completed. If the awarding authority fails to prepare and send to the contractor the final estimate within thirty-days after receipt of notice of completion, the awarding authority shall pay to the contractor interest on the amount which would have been due to the contractor pursuant to such final estimate at the rate hereinabove provided from the thirtieth-day after such completion until the date on which the awarding authority sends the final estimate to the contractor for acceptance or the date of payment therefor, whichever occurs first, provided that the awarding authority's inspection shows that not work items required by the contract remain incomplete or unsatisfactory. Interest shall not be paid hereunder on amounts for which interest is required to be paid in connection with the substantial completion estimate as hereinabove provided. The awarding authority shall include the amount of the interest required to be paid hereunder in the final estimate."

"The awarding authority shall pay the amount due pursuant to any periodic, substantial completion or final estimate within thirty-five-days after receipt of written acceptance for such estimate from the contractor and shall pay interest on the amount due pursuant to such estimate at the rate hereinabove provided from that thirty-fifth-day to the date of payment. In the case of periodic payment, the contracting authority may deduct from its payment a retention based on its estimate of the fair value of its claim against the contractor, a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and a retention to secure satisfactory performance of the contractual work not exceeding five percent of the approved amount of any periodic payments, and the same right to retention shall apply to bonded subcontractors entitled to direct payment under section thirty-nine F of chapter thirty; provided that a five percent value of all items that are planted in the ground shall be deducted from the periodic payments until final acceptance."

"No periodic, substantial completion or final estimate or acceptance or payment thereof shall bar a contractor from reserving all rights to dispute the quantity and amount of, or the failure of the awarding authority to approve a quantity and amount of, all or part of any work item or extra work item."

"Substantial completion, for the purposes of this section, shall mean either that the work required by the contract has been completed except for work having a contract price of less than one percent of the then adjusted total contract price, or substantially all of the work has been completed and opened to public use except for minor incomplete or unsatisfactory work items that do not materially impair the usefulness of the work required by the contract."

Section 39K. "Every contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building by the commonwealth, or by any county, city, town, district, board, commission or other public body, when the amount is more than five thousand dollars in the case of the commonwealth and more than two thousand dollars in the case of any county, city, town, district, board, commission or public body, shall contain the following paragraph: Within fifteen-days (twenty-four-days in the case of the commonwealth) after receipt from the contractor, at the place designated by the awarding authority if such a place is so designated, of a periodic

estimate requesting payment of the amount due for the preceding month, the awarding authority will make a periodic payment to the contractor for the work performed during the preceding month and for the materials not incorporated in the work but delivered and suitably stored at the site (or at some location agreed upon in writing) to which the contractor has title or to which a subcontractor has title and has authorized the contractor to transfer title to the awarding authority, less (1) a retention based on its estimate of the fair value of its claims against the contractor and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and less (3) a retention not exceeding five percent of the approved amount of the periodic payment. After the receipt of a periodic estimate requesting final payment and within sixty-five-days after (a) the contractor fully completes the work or substantially completes the work so that the value of the work remaining to be done is, in the estimate of the awarding authority, less than one percent of the original contract price, or (b) the contractor substantially completes the work and the awarding authority takes possession for occupancy, whichever occurs first, the awarding authority shall pay the contractor the entire balance due on the contract less, (1) a retention based on its estimate of the fair value of its claims against the contractor and of the cost of completing the incomplete and unsatisfactory items of work less (2) a retention for direct payments to subcontractors based on demand for same in accordance with the provisions of section thirty-nine F, or based on the record of payments by the contractor to the subcontractors under this contract if such record of payment indicates that the contractor has not paid subcontractors as provided in section thirty-nine F. If the awarding authority fails to make payment as herein provided, there shall be added to each such payment daily interest at the rate of three percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston commencing on the first-day after said payment is due and continuing until the payment is delivered or mailed to the contractor; provided, that no interest shall be due, in any event, on the amount due on a periodic estimate for final payment until fifteen-days (twenty-four-days in the case of the commonwealth) after receipt of such a periodic estimate from the contractor, at the place designated by the awarding authority if such a place is so designated. The contractor agrees to pay to each subcontractor a portion of any such interest paid in accordance with the amount due each subcontractor."

"The awarding authority may make changes in any periodic estimate submitted by the contractor and the payment due on said periodic estimate shall be computed in accordance with the changes so made, but such changes or any requirement for a corrected periodic estimate shall not affect the due date for the periodic payment or the date for the commencement of interest charges on the amount of the periodic payment computed in accordance with the changes made, as provided herein; provided, that the awarding authority may, within seven-days after receipt, return to the contractor for correction, any periodic estimate which is not in the required form or which contains computations not arithmetically corrected and, in that event, the date of receipt of such periodic estimate shall be the date of receipt of the corrected periodic estimate in proper form with arithmetically correct computations. The date of receipt of a periodic estimate received on a Saturday shall be the first working day thereafter. The provisions of section thirty-nine G shall not apply to any contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building to which this section applies."

"All periodic estimates shall be submitted to the awarding authority, or to its designee as set forth in writing to the contractor, and the date of receipt by the awarding authority or its designee shall be marked on the estimate. All periodic estimates shall contain a separate item for each filed subtrade and each subtrade listed in sub-bid form as required by specifications and a column listing the amount paid to each filed subcontractor and Sub-subcontractor as of the date the periodic estimate is filed. The person making payment for the awarding authority shall add the daily interest provided for herein to each payment for each day beyond the due date based on the date of receipt marked on the estimate."

"A certificate of the architect to the effect that the contractor has fully or substantially completed the work shall, subject to the provisions of section thirty-nine J, be conclusive for the purposes of this section."

Section 39L. "Public Construction work by foreign corporations; restrictions and reports." The Commonwealth and every county, city, town, district, board, commission or other public body which, as the awarding authority, request proposals, bids or sub-bids for any work in the construction, reconstruction, alteration, remodeling, repair or demolition of any public building or other public works (1) shall not enter into a contract for such work with, and shall not approve as a subcontractor furnishing labor and materials for a part of any such work, a foreign corporation which has not filed with such awarding authority a certificate of the state secretary stating that such corporation has complied with sections three and five of chapter one hundred and eighty-one and the date of such compliance, and (2) shall report to the state secretary and to the department of corporations and taxation any foreign corporation performing work under such contract or subcontract, and any person, other than a corporation, performing work under such contract or subcontract, and residing or having a principal place of business outside the commonwealth."

Section 39M(b). "Specifications for such contracts, and specifications for contracts awarded pursuant to the provisions of said sections forty-four A to forty-four L of said chapter one hundred and forty-nine, shall be written to provide for full competition for each item of material to be furnished under the contract; except, however, that said specifications may be otherwise written for sound reasons in the public interest stated in writing in the public records of the awarding authority or promptly given in writing by the awarding authority to anyone making a written request therefor, in either instance such writing to be prepared after reasonable investigation. Every such contract shall provide that an item equal to that named or described in the said specifications may be furnished; and an item shall be considered equal to the item so named or described if (1) it is at least equal in quality, durability, appearance, strength and design, (2) it will perform at least equally the function imposed by the general design for or the public work being contracted for or the material being purchased, and (3) it conforms substantially, even with deviations, to the detailed requirements for the item in the said specifications."

"For each item of material the specifications shall provide for either a minimum of three named brands of material or a description of material which can be met by a minimum of three manufacturers or producers, and for the equal of any one of said named or described materials."

Section 39N. Every contract subject to section forty-four A of Chapter one hundred and forty-nine or subject to section thirty-nine M of chapter thirty shall contain the following paragraph in its entirety and an awarding authority may adopt reasonable rules or regulations in conformity with that paragraph concerning the filing, investigation and settlement of such claims:

"If, during the progress of the work, the contractor or the awarding authority discovers that the actual subsurface or latent physical conditions encountered at the site differ substantially or materially from those shown on the plans or indicated in the contract documents either the contractor or the contracting authority may request an equitable adjustment in the contract price of the contract applying to work affected by the differing site conditions. A request for such an adjustment shall be in writing and shall be delivered by the party making such claim to the other party as soon as possible after such conditions are discovered. Upon receipt of such a claim from a contractor, or upon its own initiative, the contracting authority shall make an investigation of such physical conditions, and, if they differ substantially or materially from those shown on the plans or indicated in the contract documents or from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the plans and contract documents and are of such a nature as to cause an increase or decrease in the cost of performance of the work or a change in the construction methods required for the performance of the work which results in an increase or decrease in the cost of the work, the contracting authority shall make an equitable adjustment in the contract price and the contract shall be modified in writing accordingly."

Section 39O. Every contract subject to the provisions of section thirty-nine M of this chapter or subject to section forty-four A of chapter one hundred forty-nine shall contain the following provisions (a) and (b) in their entirety....

- (a) "The awarding authority may order the general contractor in writing to suspend, delay, or interrupt all or any part of the work for such period of time as it may determine to be appropriate for the convenience of the awarding authority; provided however, that if there is a suspension, delay or interruption for fifteen-days or more due to a failure of the awarding authority to act within the time specified in this contract, the awarding authority shall make an adjustment in the contract price for any increase in the cost of performance of this contract but shall not include any profit to the general contractor on such increase; and provided further, that the awarding authority shall not make any adjustment in the contract price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this contract provides for an equitable adjustment of the contract price under any other contract provisions."
- (b) "The general contractor must submit the amount of a claim under provision (a) to the awarding authority in writing as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the awarding authority shall not approve any costs in the claim incurred more than twenty-days before the general contractor notified the awarding authority in writing of the act or failure to act involved in the claim."

Section 39P. "Every contract subject to section thirty-nine M of this chapter or section forty-four A of chapter one hundred forty-nine which requires the awarding authority, or any official, its architect or engineer to make a decision on interpretation of the specifications, approval of equipment, material or any other approval, or progress of the work, shall require that the decision be made promptly and, in any event, no later than thirty-days after the written submission for decision; but if such decision requires extended investigation and study, the awarding authority, the official, architect or engineer shall, within thirty-days after the receipt of the submission, give the party making the submission written notice of the reasons why the decision cannot be made within the thirty-day period and the date by which the decision will be made."

Section 39R(a). The words defined herein shall have the meaning stated below whenever they appear in this section:

- (1) "Contractor" means any person, corporation, partnership, joint venture, sole proprietorship, or other entity awarded a contract pursuant to section thirty-nine M of chapter thirty, sections forty-four A through H, inclusive, of chapter one hundred and forty-nine and sections thirty B through thirty P, inclusive, of chapter seven.

- (2) "Contract" means any contract awarded or executed pursuant to sections thirty B through thirty P, inclusive, of chapter seven and any contract awarded or executed pursuant to section thirty-nine M of chapter thirty, or sections forty-four A through H, inclusive, of chapter one hundred and forty-nine, which is for an amount or estimated amount greater than one hundred thousand dollars
- (3) "Records" means books of original entry, accounts, checks, bank statements and all other banking documents, correspondence, memoranda, invoices, computer printouts, tapes, discs, papers and other documents or transcribed information of any type, whether expressed in ordinary or machine language.
- (4) "Independent Certified Public Accountant" means a person duly registered in good standing and entitled to practice as a certified public accountant under the laws of the place of his/her residence or principal office and who is in fact independent. In determining whether an accountant is independent with respect to a particular person, appropriate consideration should be given to all relationships between the accountant and that person or any affiliate thereof. Determination of an accountant's independence shall not be confined to the relationships existing in connection with the filing of reports with the awarding authority.
- (5) "Audit," when used in regard to financial statements, means an examination of records by an independent certified public accountant in accordance with generally accepted accounting principles and auditing standards for the purpose of expressing a certified opinion thereon, or, in the alternative, a qualified opinion or a declination to express an opinion for stated reasons.
- (6) "Accountant's Report," when used in regard to financial statements, means a document in which an independent certified public accountant indicates the scope of the audit which he/she has made and sets forth his/her opinion regarding the financial statements taken as a whole with a listing of noted exceptions and qualifications, or an assertion to the effect that an overall opinion cannot be expressed. When an overall opinion cannot be expressed the reason therefor shall be stated. An accountant's report shall include as a part thereof a signed statement by the responsible corporate officer attesting that management has fully disclosed all material facts to the independent certified public accountant, and that the audited financial statement is a true and complete statement of the financial condition of the contractor.
- (7) "Management," when used herein, means the chief executive officer, partners, principals or other person or persons primarily responsible for the financial and operational policies and practices of the contractor.

- (8) Accounting terms, unless otherwise defined herein, shall have a meaning in accordance with generally accepted accounting principles and auditing standards.
- (b) Subsection (a)(2) hereof notwithstanding, every agreement or contract awarded or executed pursuant to sections thirty B through thirty P, inclusive, of chapter seven, and pursuant to section thirty-nine M of chapter thirty or to section forth-five A through H, inclusive, of chapter one hundred and forty-nine, shall provide that:
- (1) The contractor shall make, and keep for at least six years after final payment, books, records, and accounts which in reasonable detail accurately and fairly reflect the transactions and dispositions of the contractor, and
- (2) Until the expiration of six years after final payment, the awarding authority, office of inspector general, and the deputy commissioner of capital planning and operations shall have the right to examine any books, documents, papers or records of the contractor or of his/her subcontractors that directly pertain to, and involve transactions relating to, the contractor or his/her subcontractors, and
- (3) If the agreement is a contract as defined herein, the contractor shall describe any change in the method of maintaining records or recording transactions which materially affect any statements filed with the awarding authority, including in his/her description the date of the change and reasons therefor, and shall accompany said descriptions with a letter from the contractor's independent certified public accountant approving or otherwise commenting on the changes, and
- (4) If the agreement is a contract as defined herein, the contractor has filed a statement of management on internal accounting controls as set forth in paragraph (c) below prior to the execution of the contract, and
- (5) If the agreement is a contract as defined herein, the contractor has field prior to the execution of the contracts and will continue to file annually, an audited financial statement for the most recent completed fiscal year as set forth in paragraph (d) below.
- (c) Every contractor awarded a contract shall file with the awarding authority a statement of management as to whether the system of internal accounting controls of the contractor and subsidiaries reasonably assures that:

- (1) Transactions are executed in accordance with management's general and specific authorization;
- (2) Transactions are recorded as necessary:
 - i. To permit preparation of financial statements in conformity with generally accepted accounting principles, and
 - ii. To maintain accountability for assets;
- (3) Access to assets is permitted only in accordance with management's general or specific authorization; and
- (4) The recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action was taken with respect to any difference.

Every contractor awarded a contract shall also file with the awarding authority a statement prepared and signed by an independent certified public accountant, stating that he/she has examined the statement of management on internal accounting controls, and expressing an opinion as to:

- (1) Whether the representations of management in response to this paragraph, and paragraph (b) above are consistent with the result of management's evaluation of the system of internal accounting controls; and
 - (2) Whether such representations of management are, in addition, reasonable with respect to transactions and assets in amounts which would be material when measured in relation to the applicant's financial statements.
- (d) Every contractor awarded a contract by the commonwealth or by any political subdivision thereof shall annually file with the awarding authority and the deputy commissioner of capital planning and operations during the term of the contract a financial statement prepared by an independent certified public accountant on the basis of an audit by such accountant. The final statement filed shall include the date of final payment. All statements shall be accompanied by an accountant's report. Such statements shall be made available to the awarding authority upon request.
- (e) The office of inspector general, the deputy commissioner for capital planning and operations and any other awarding authority shall enforce the provisions of this section. The deputy commissioner of capital planning and operations may after providing an opportunity for the inspector general and other interested parties to comment, promulgate pursuant to the

provisions of chapter thirty A such rules, regulations and guidelines as are necessary to effectuate the purposes of this section. Such rules, regulations and guidelines may be applicable to all awarding authorities. A contractor's failure to satisfy any of the requirements of this section may be grounds for debarment pursuant to section forty-four C of chapter one hundred and forty-nine.

- (f) Records and statements required to be made, kept or filed under the provisions of this section shall not be public records as defined in section seven of chapter four and shall not be open to public inspection; provided, however, that such records and statements shall be made available pursuant to the provisions of clause (2) of paragraph (b).

Section 40. "Bonds give to the commonwealth, any county, city, town or political subdivision to secure the performance of contracts for the construction or repair of public buildings or other public works may be discharged or released by the awarding authority, upon such terms as it deems expedient, after the expiration of one year from the time of completion, subject to section thirty-nine K, of the work contracted to be done; provided that no claim filed under said bond is pending, and provided further, that no such bonds shall be discharged or released prior to the expiration of all special guarantees provided for in the contract unless new bonds in substitution therefor specifically relating to the unexpired guarantees shall be taken."

EQUAL EMPLOYMENT OPPORTUNITIES

The Contractor and each Subcontractor shall comply with the provisions of the Governor's "Executive Order No. 74", dated July 20, 1970, entitled the "Governor's Code of Fair Practices", as amended by the Governor's "Executive Order No. 116", dated May 1, 1975; with the Fair Employment Practices Law of Massachusetts, as amended; with the Rules and Regulations of the Massachusetts Commission Against Discrimination, as in force at the date hereof; and with all other applicable municipal, state and federal laws and regulation regarding equal employment opportunity.

CITY OF WOBURN, MASSACHUSETTS 2020- YEAR II WATER MAIN IMPROVEMENTS

PREPARED BY
CITY OF WOBURN
ENGINEERING DEPARTMENT
10 COMMON STREET
WOBURN, MASSACHUSETTS 01801



MAYOR
SCOTT D. GALVIN

**SUPERINTENDENT of
PUBLIC WORKS**
JOHN F. DURAN III, PE

**DEPUTY SUPERINTENDENT of
PUBLIC WORKS**
LEONARD BURNHAM

CITY ENGINEER
JOHN E. COREY JR., P.E.

**W.T.P. and DISTRIBUTION
MANAGER**
ANTHONY BLAZEJOWSKI



SHEET INDEX

SHEET NUMBER	TITLE
COVER SHEET	YEAR II WATER MAIN IMPROVEMENTS
1 OF 6	MOUNTAIN STREET
2 OF 6	HOUGHTON STREET 1
3 OF 6	HOUGHTON STREET 2
4 OF 6	DAVIS STREET
5 OF 6	MONTVALE AVENUE
6 OF 6	DETAILS

LEGEND

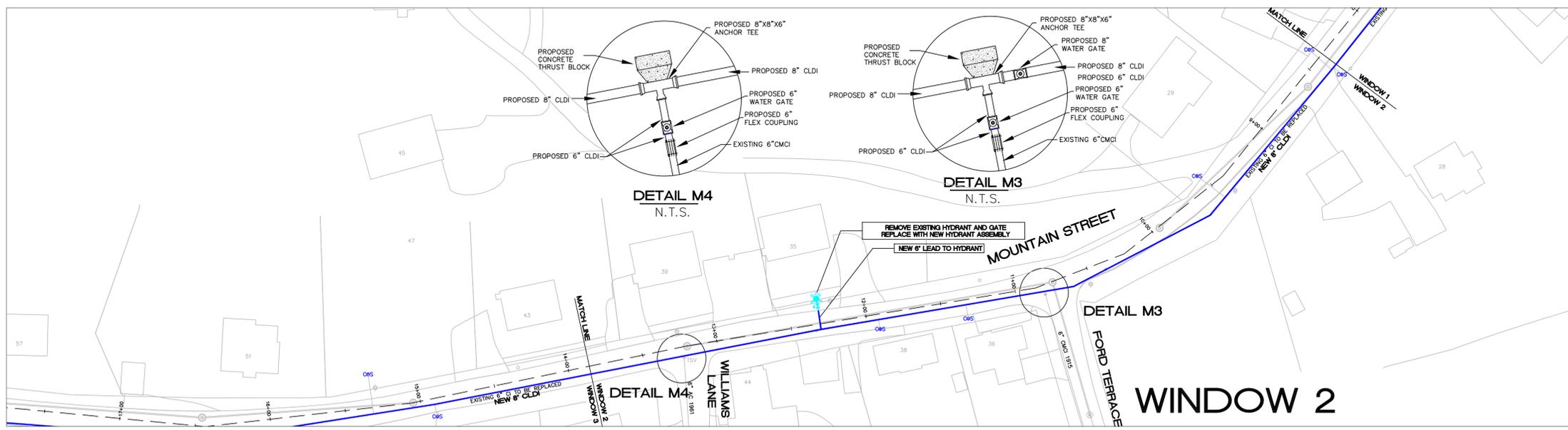
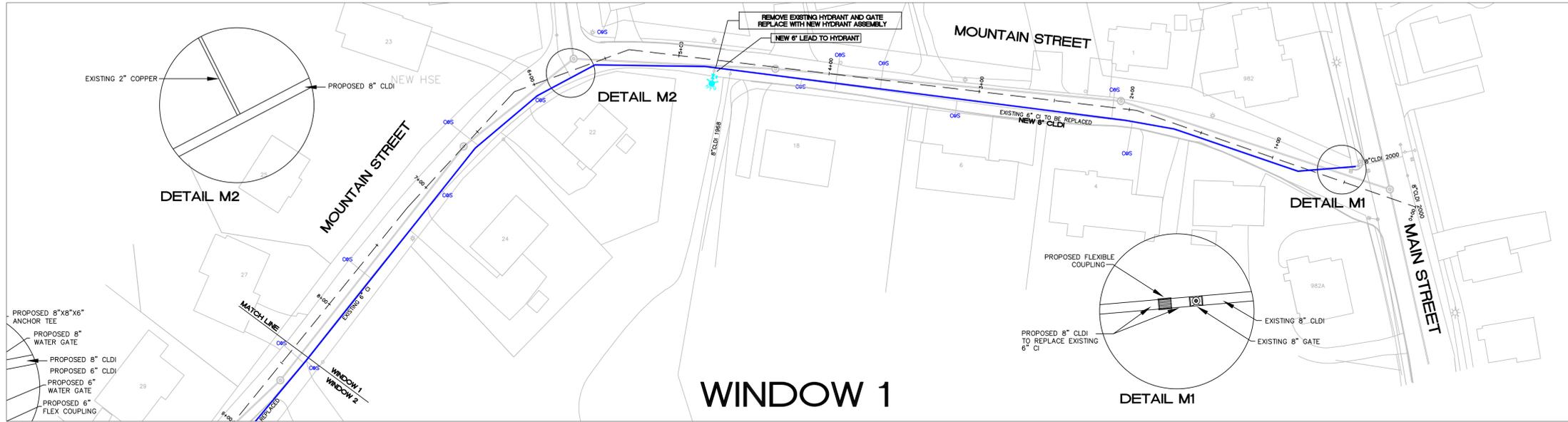
EXISTING	PROPOSED
● SEWER MANHOLE	— PROPOSED WATER MAIN
● WATER VALVE MANHOLE	--- WATER MAIN TO BE CLEANED AND LINED
● DRAIN MANHOLE	⊕ HYDRANT ASSEMBLY
● CATCH BASIN	⊕ WATER GATE VALVE
● ELECTRIC MANHOLE	--- TEMPORARY WATER SUPPLY
● TELEPHONE MANHOLE	--- TEMPORARY WATER SUPPLY BURIED
⊕ WATER VALVE	
⊕ WATER SERVICE CURB STOP	
⊕ GAS SERVICE CURB STOP	
— SEWER MAIN	
— WATER MAIN	
— DRAIN LINE	
— ELECTRIC LINE	
— TELEPHONE LINE	
— GAS LINE	
⊕ UTILITY POLE	
⊕ UTILITY POLE/STREET LIGHT	
⊕ STREET LIGHT	
⊕ HYDRANT	
⊕ TRAFFIC SIGNAL POLE	
⊕ SIGN POST	
100.50 TOP & BOTTOM CURB ELEVATION	
100.00 SPOT ELEVATION	
100.00 SPOT ELEVATION	
--- CONTOUR LINE	

GENERAL NOTES:

1. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. ALL CONSTRUCTION ACTIVITY SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS.
2. THE CONSTRUCTION PLANS CONTAINED HERE IN ARE SUPPLEMENTAL TO THE CONTRACT SPECIFICATIONS. THE TWO TAKEN TOGETHER FORM THE BASIS OF THE WORK OF THE CONTRACT REQUIREMENTS.
3. ALL TEMPORARY HYDRANT LOCATIONS TO BE APPROVED BY THE FIRE CHIEF

GENERAL UTILITY NOTES:

1. THE EXISTING MUNICIPAL UTILITIES SHOWN ON THIS PLAN ARE BASED ON AVAILABLE PLANS AND INFORMATION AND FIELD LOCATIONS AND ARE TO BE CONSIDERED TO BE APPROXIMATE ONLY. THE CONTRACTOR IS RESPONSIBLE TO NOTIFY DIG SAFE PRIOR TO CONSTRUCTION TO OBTAIN THE LOCATION OF ALL PRIVATE UTILITIES.
2. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES AND INVERTS BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY CONTRACTORS FAILURE TO PROPERLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.
3. ALL PAVEMENT CUTS AND PATCHES IN PUBLIC RIGHT OF WAYS SHALL CONFORM TO THE CITY OF WOBURN TRENCH DETAILS AND SPECIFICATIONS.



YEAR 11 WATER MAIN IMPROVEMENTS
 LOCATION
MOUNTAIN STREET
 MAIN STREET - WINTER STREET

CAD	YEAR11MASTER
DATE	MO DAY YEAR
SCALE	1"=40'
DRAWN BY	GLR
CHECKED BY	JEC

REVISIONS	
DATE	COMMENT
00/00/00	X

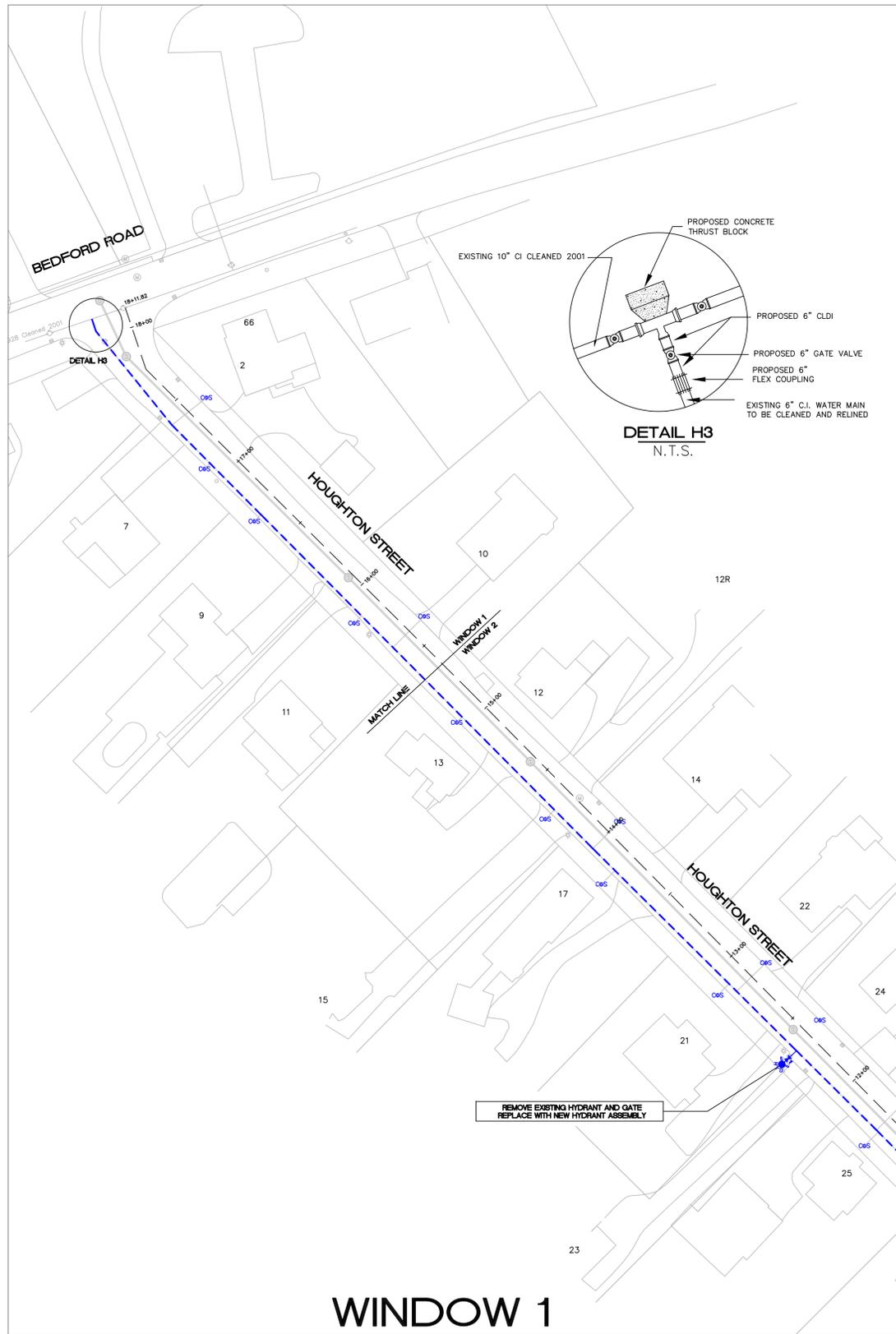
JOHN E. COREY
 PROFESSIONAL ENGINEER
 MASSACHUSETTS REG. 31513

CITY OF WOBURN
 ENGINEERING DEPARTMENT
 10 COMMON STREET
 WOBURN, MASSACHUSETTS
 01801

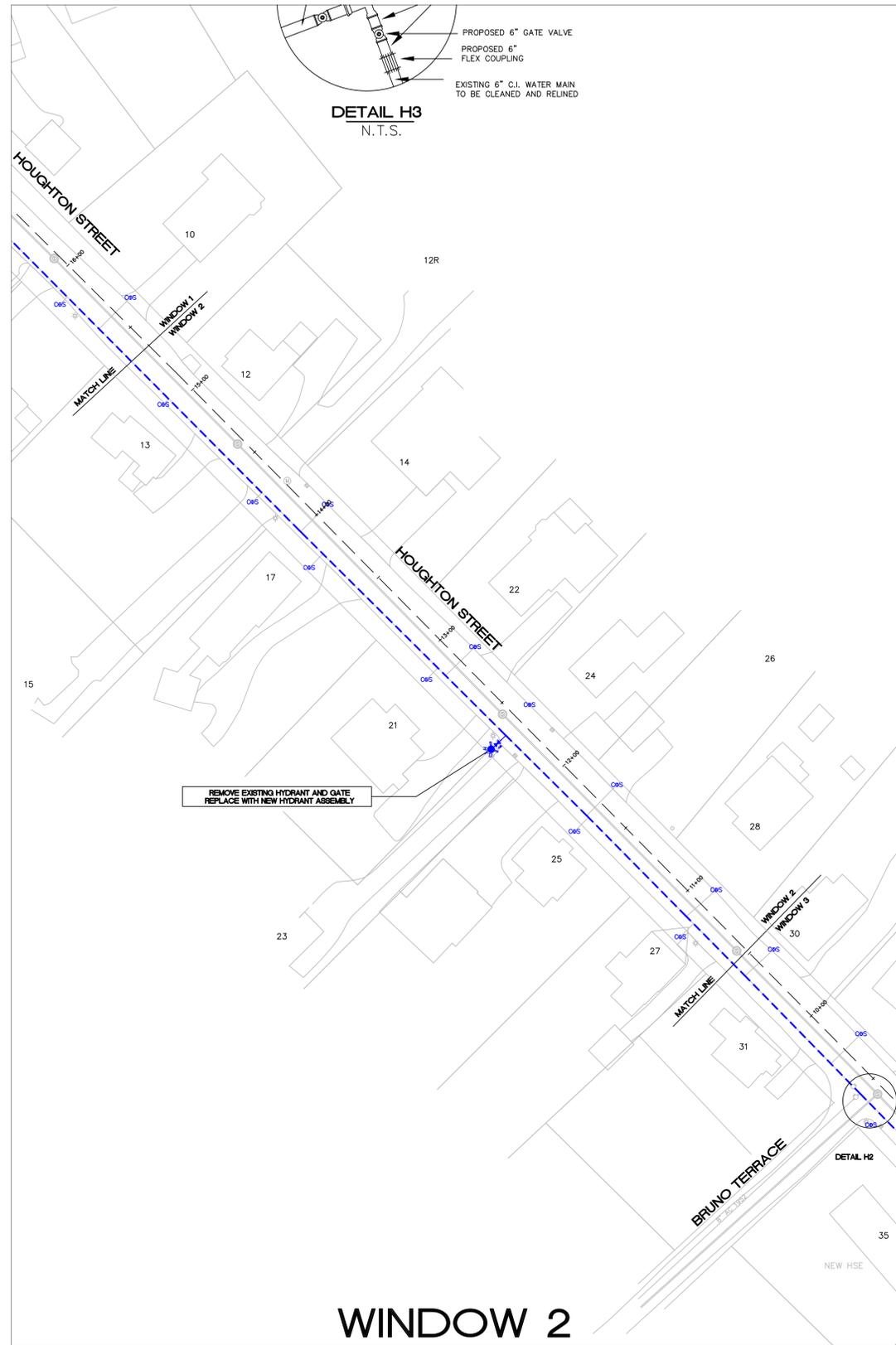
SHEET TITLE
MOUNTAIN STREET

SHEET NUMBER
1

OF 6



WINDOW 1



WINDOW 2



YEAR 11 WATER MAIN IMPROVEMENTS
 LOCATION
HOUGHTON STREET
 HARRISON AVENUE - BEDFORD ROAD

CAD	YEAR11MASTER
DATE	MO DAY YEAR
SCALE	1"=40'
DRAWN BY	GLR
CHECKED BY	JEC

REVISIONS	
DATE	COMMENT
00/00/00	X

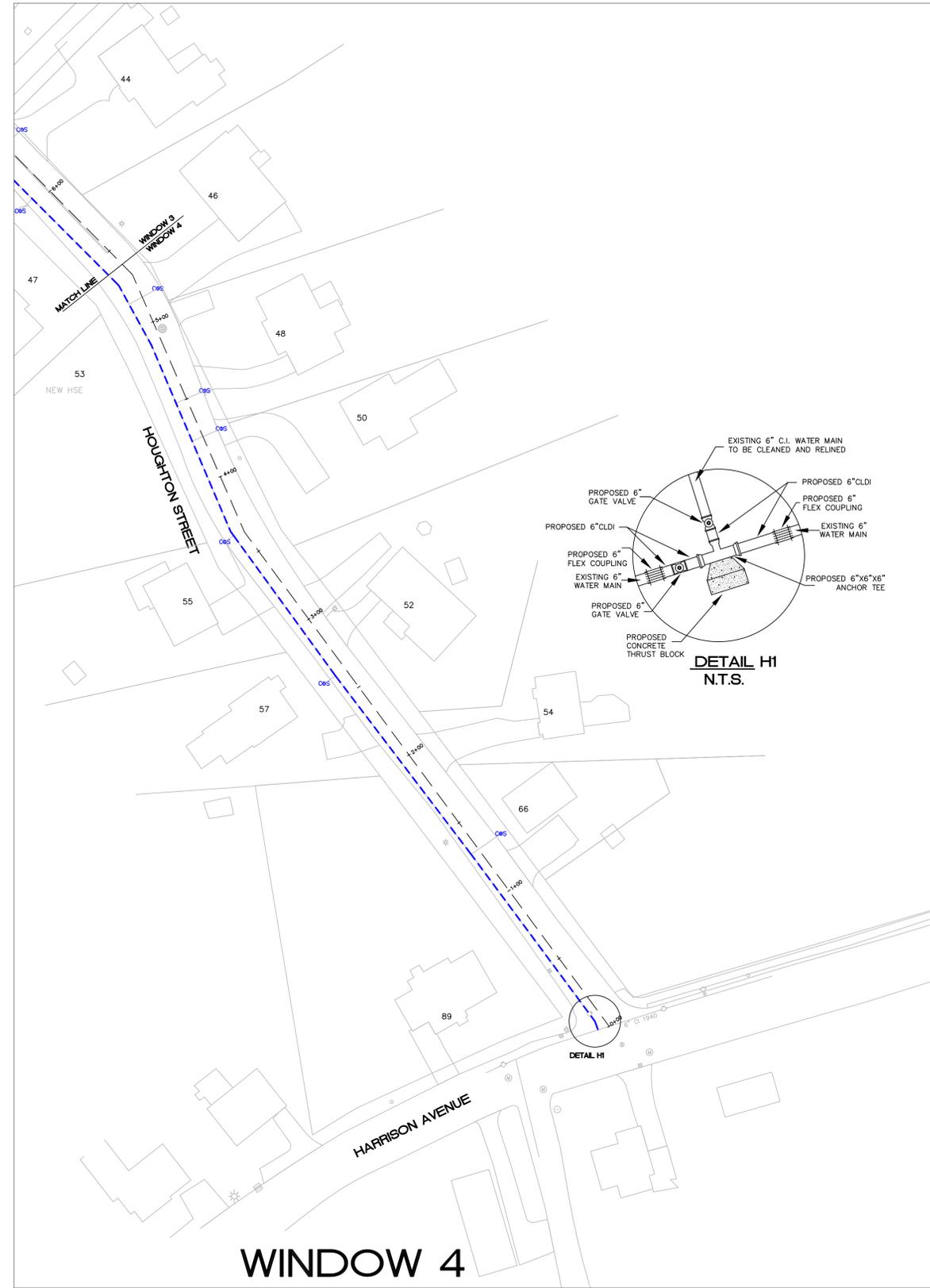
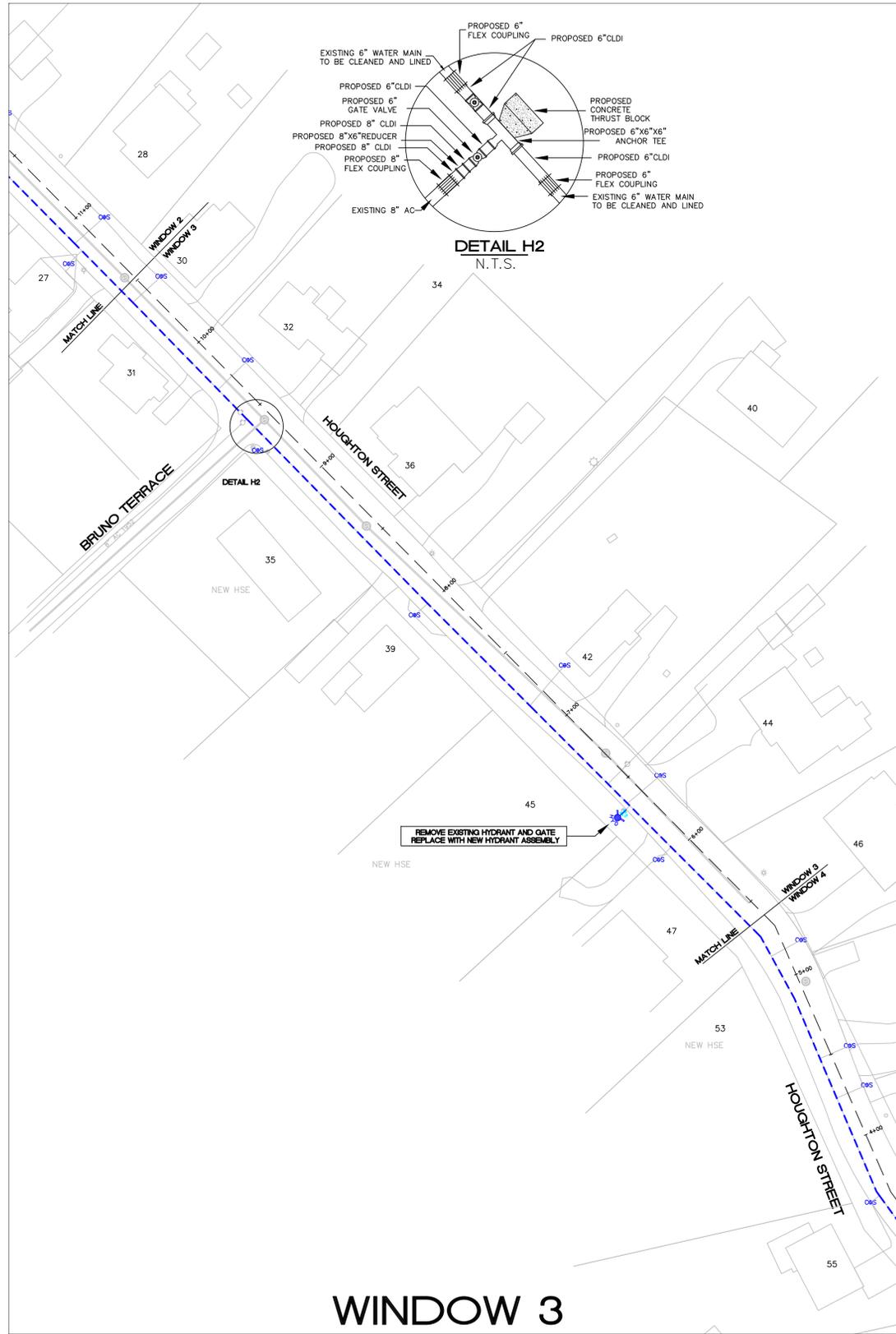
JOHN E. COREY
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 MASSACHUSETTS REG. 31913

John E. Corey, Jr.

CITY OF WOBURN
 ENGINEERING DEPARTMENT
 10 COMMON STREET
 WOBURN, MASSACHUSETTS
 01801



SHEET TITLE	HOUGHTON STREET 1
SHEET NUMBER	2
	OF 6



YEAR 11 WATER MAIN IMPROVEMENTS
LOCATION
HOUGHTON STREET
HARRISON AVENUE - BEDFORD ROAD

CAD	YEAR11MASTER
DATE	MO DAY YEAR
SCALE	1"=40'
DRAWN BY	GLR
CHECKED BY	JEC

REVISIONS	
DATE	COMMENT
00/00/00	X

JOHN E. COREY
PROFESSIONAL ENGINEER
MASSACHUSETTS REG. 31513

CITY OF WOBURN
ENGINEERING DEPARTMENT
10 COMMON STREET
WOBURN, MASSACHUSETTS
01801



SHEET TITLE
HOUGHTON STREET 2

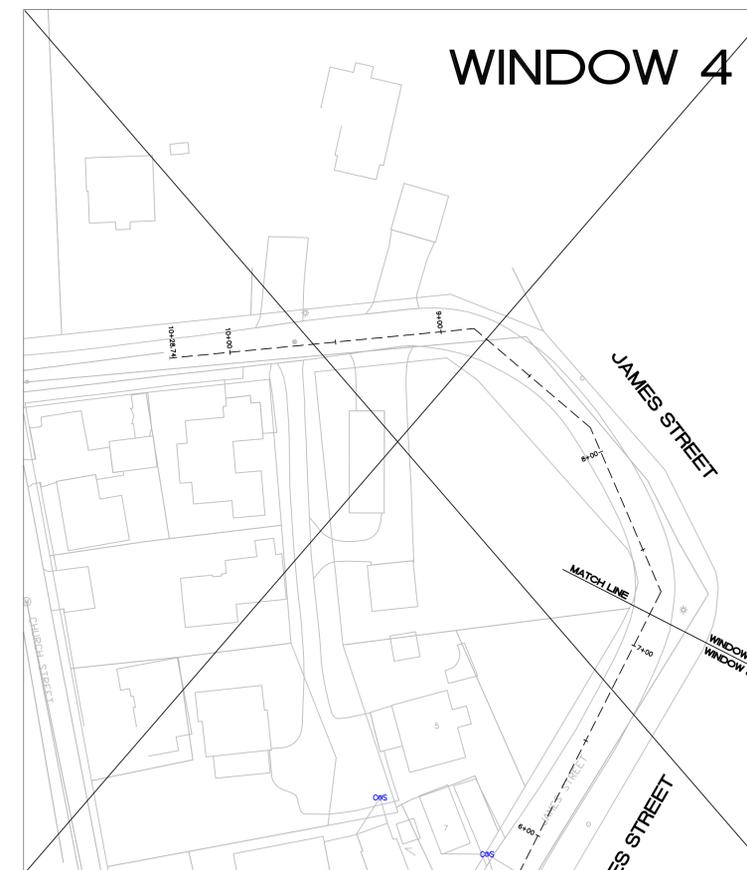
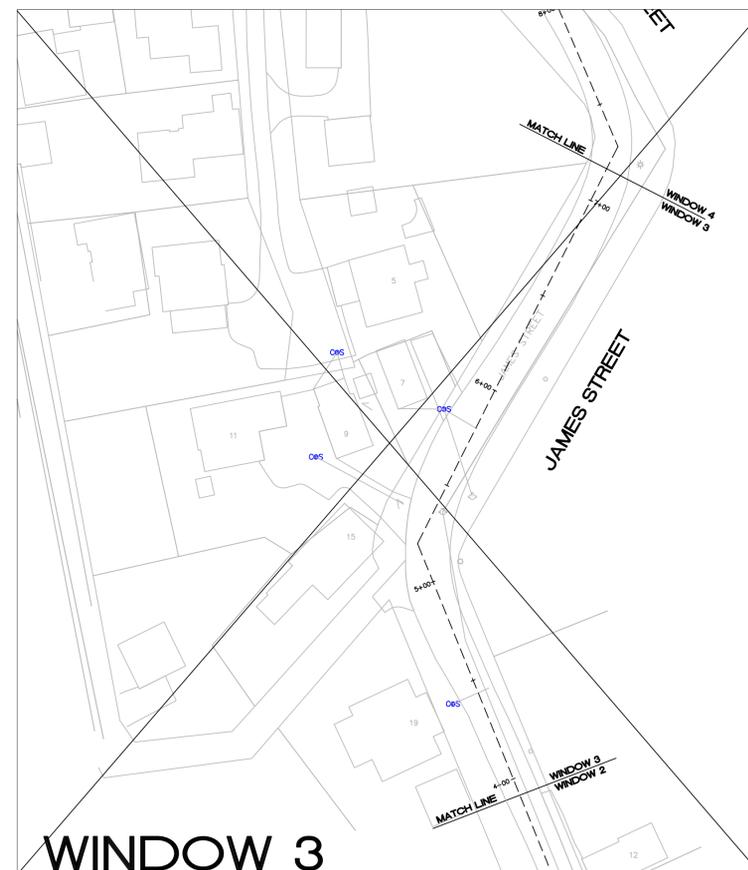
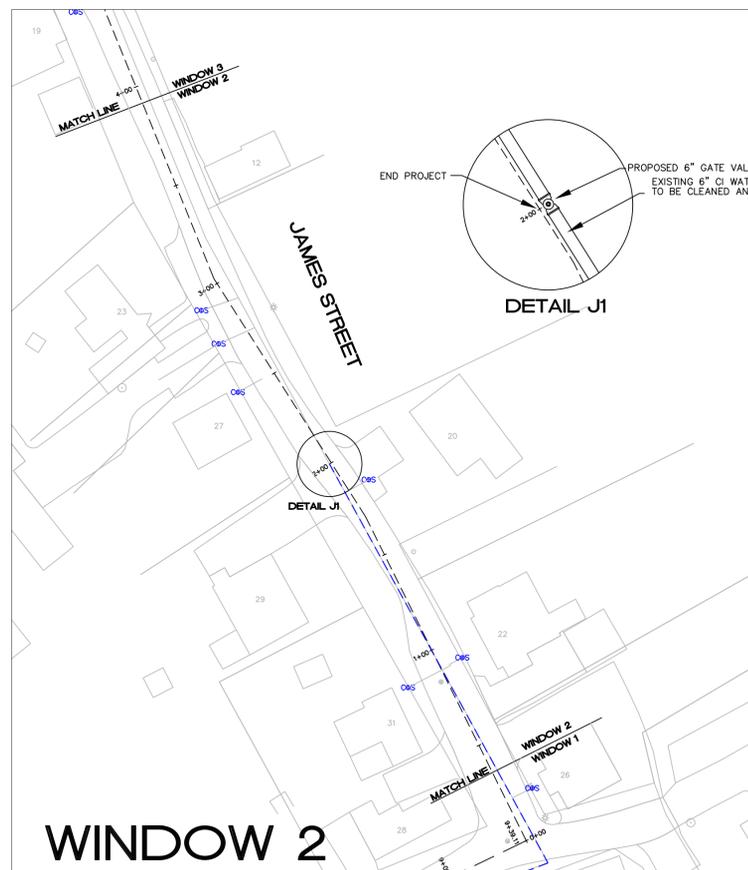
SHEET NUMBER
3



YEAR 11 WATER MAIN IMPROVEMENTS
LOCATION
DAVIS STREET X

CAD	YEAR11MASTER
DATE	MO DAY YEAR
SCALE	1"=40'
DRAWN BY	GLR
CHECKED BY	JEC

REVISIONS	
DATE	COMMENT
00/00/00	X



JOHN E. COREY
PROFESSIONAL ENGINEER
MASSACHUSETTS REG. 51513

CITY OF WOBURN
ENGINEERING DEPARTMENT
10 COMMON STREET
WOBURN, MASSACHUSETTS
01801



SHEET TITLE
DAVIS STREET

SHEET NUMBER
4

OF 6



YEAR 11 WATER MAIN IMPROVEMENTS
 LOCATION
MONTVALE AVENUE
 WASHINGTON STREET - ABERJONA RIVER

CAD	YEAR11MASTER
DATE	MO DAY YEAR
SCALE	1"=40'
DRAWN BY	GLR
CHECKED BY	JEC

REVISIONS	
DATE	COMMENT
00/00/00	X

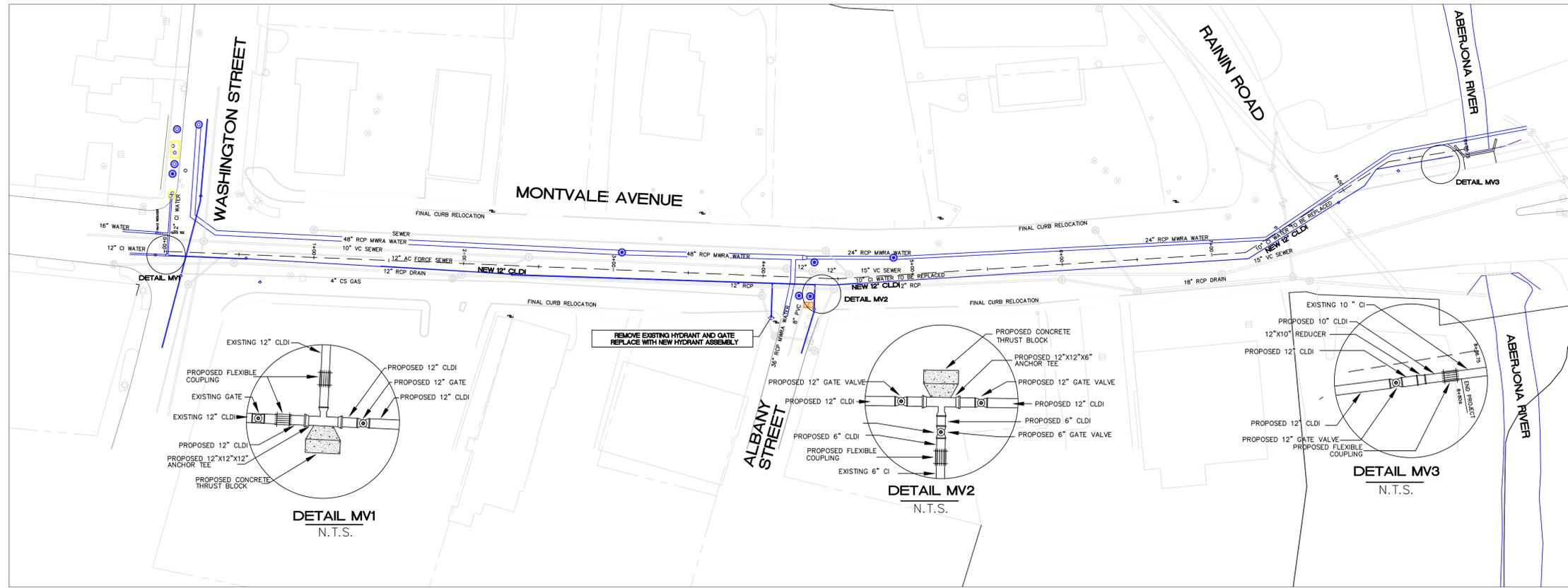
JOHN E. COREY
 PROFESSIONAL ENGINEER
 MASSACHUSETTS REG. 31513

CITY OF WOBURN
 ENGINEERING DEPARTMENT
 10 COMMON STREET
 WOBURN, MASSACHUSETTS
 01801

SHEET TITLE
MONTVALE AVENUE

SHEET NUMBER
5

OF 6



YEAR 11 WATER MAIN IMPROVEMENTS
 LOCATION
**MOUNTAIN STREET
 HOUGHTON STREET
 DAVIS STREET
 MONTVALE AVENUE**

CAD YEAR11MASTER
 DATE MO DAY YEAR
 SCALE NTS
 DRAWN BY GLR
 CHECKED BY JEC

REVISIONS

DATE	COMMENT
00/00/00	X

NOTES

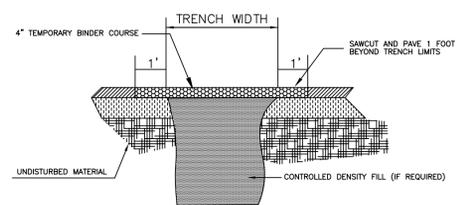
JOHN E. COREY
 PROFESSIONAL ENGINEER
 MASSACHUSETTS REG. 31513



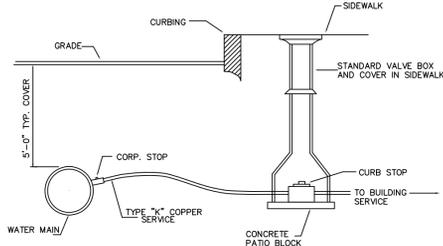
CITY OF WOBURN
 ENGINEERING DEPARTMENT
 10 COMMON STREET
 WOBURN, MASSACHUSETTS
 01801



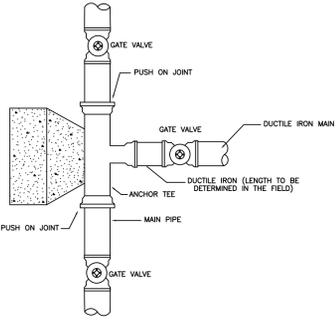
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DETAILS
 SHEET NUMBER
6
 OF 6



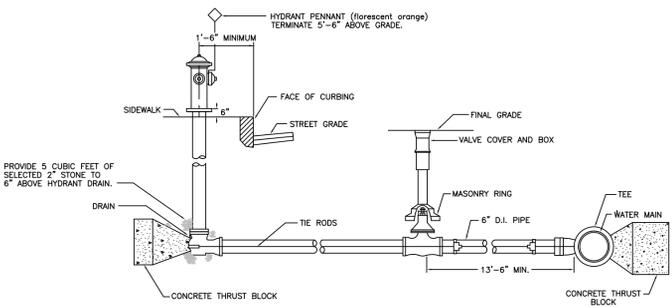
TEMPORARY PAVEMENT DETAIL
 N T S
 PER SPECIFICATIONS



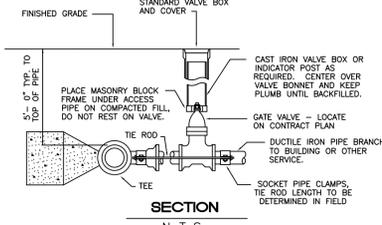
TYPICAL COPPER SERVICE CONNECTION
 N T S



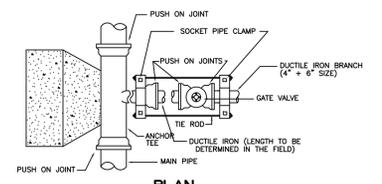
TYPICAL 3 WAY GATE WATER CONNECTION
 N T S



TYPICAL FIRE HYDRANT CONNECTION
 N T S
 PER SPECIFICATIONS

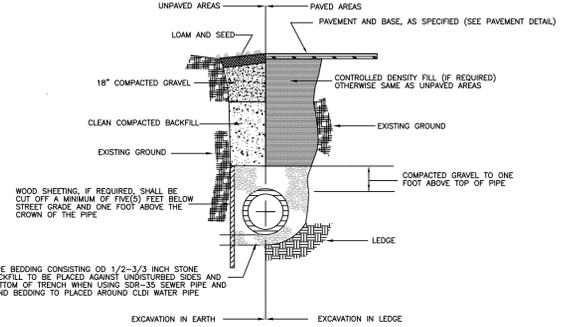


SECTION
 N T S

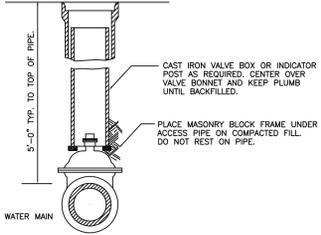


PLAN
 N T S

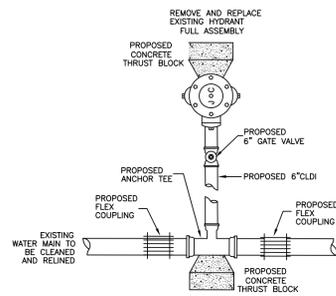
TYPICAL SERVICE BRANCH CONNECTION



TYPICAL TRENCH DETAIL
 N T S

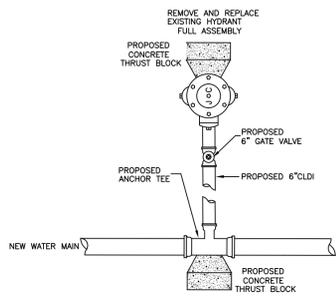


TYPICAL GATE VALVE INSTALLATION IN TRENCH
 N T S
 PER SPECIFICATIONS

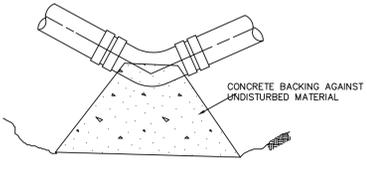


MAIN RELINING

HYDRANT DETAIL
 N.T.S.
 PER SPECIFICATIONS



MAIN REPLACEMENT

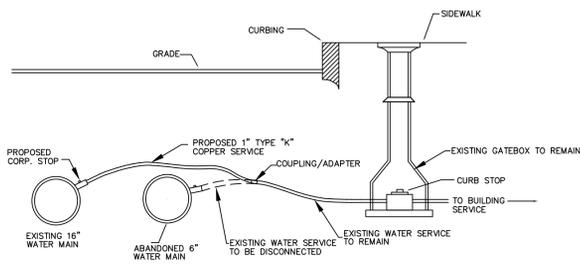


TYPICAL BEND DETAIL
 N T S

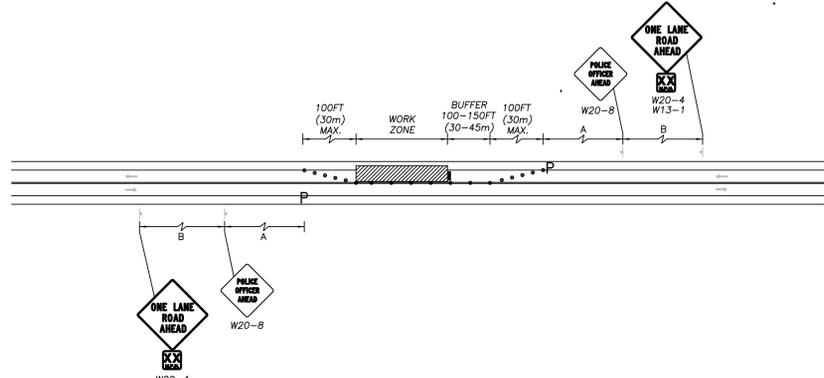
TABLE OF BEARING AREAS IN SQUARE FEET AGAINST UNDISTURBED MATERIAL FOR WATER MAIN FITTINGS

SIZE OF MAIN (IN)	45° BEND	TEES & FLUJES	22 1/2° BEND
8" & LESS	8	10	8
10" & 12"	22	16	13

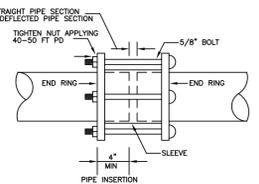
CONCRETE BACKING FOR WATER PIPE



CHANGEOVER SERVICE CONNECTION
 N T S



TEMPORARY LANE CLOSURE DETAIL
 N T S
 W13-1



FLEX COUPLING
 N T S
 COUPLING TO MEET AWWA STANDARD C219 COUPLING SPEC



**THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF LABOR AND WORKFORCE DEVELOPMENT
DEPARTMENT OF LABOR STANDARDS**

Prevailing Wage Rates

**As determined by the Director under the provisions of the
Massachusetts General Laws, Chapter 149, Sections 26 to 27H**

CHARLES D. BAKER
Governor

ROSALIN ACOSTA
Secretary

MICHAEL FLANAGAN
Interim Director

KARYN E. POLITO
Lt. Governor

Awarding Authority: City of Woburn

Contract Number:

City/Town: WOBURN

Description of Work: Water systems improvements

Job Location: Woburn

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- This wage schedule applies only to the specific project referenced at the top of this page and uniquely identified by the “Wage Request Number” on all pages of this schedule.
- An Awarding Authority must request an updated wage schedule from the Department of Labor Standards (“DLS”) if it has not opened bids or selected a contractor within 90 days of the date of issuance of the wage schedule. For CM AT RISK projects (bid pursuant to G.L. c.149A), the earlier of: (a) the execution date of the GMP Amendment, or (b) the bid for the first construction scope of work must be within 90-days of the wage schedule issuance date.
- The wage schedule shall be incorporated in any advertisement or call for bids for the project as required by M.G.L. c. 149, § 27. The wage schedule shall be made a part of the contract awarded for the project. The wage schedule must be posted in a conspicuous place at the work site for the life of the project in accordance with M.G.L. c. 149 § 27. The wages listed on the wage schedule must be paid to employees performing construction work on the project whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.
- All apprentices working on the project are required to be registered with the Massachusetts Department of Labor Standards, Division of Apprentice Standards (DLS/DAS). Apprentice must keep his/her apprentice identification card on his/her person during all work hours on the project. An apprentice registered with DAS may be paid the lower apprentice wage rate at the applicable step as provided on the prevailing wage schedule. **Any apprentice not registered with DLS/DAS regardless of whether or not they are registered with any other federal, state, local, or private agency must be paid the journeyworker's rate for the trade.**
- The wage rates will remain in effect for the duration of the project, except in the case of multi-year public construction projects. For construction projects lasting longer than one year, awarding authorities must request an updated wage schedule. Awarding authorities are required to request these updates no later than two weeks before the anniversary of the date the contract was executed by the awarding authority and the general contractor. For multi-year CM AT RISK projects, awarding authority must request an annual update no later than two weeks before the anniversary date, determined as the earlier of: (a) the execution date of the GMP Amendment, or (b) the execution date of the first amendment to permit procurement of construction services. Contractors are required to obtain the wage schedules from awarding authorities, and to pay no less than these rates to covered workers. The annual update requirement is not applicable to 27F “rental of equipment” contracts.
- Every contractor or subcontractor which performs construction work on the project is required to submit weekly payroll reports and a Statement of Compliance directly to the awarding authority by mail or email and keep them on file for three years. Each weekly payroll report must contain: the employee’s name, address, occupational classification, hours worked, and wages paid. Do not submit weekly payroll reports to DLS. A sample of a payroll reporting form may be obtained at <http://www.mass.gov/dols/pw>.
- Contractors with questions about the wage rates or classifications included on the wage schedule have an affirmative obligation to inquire with DLS at (617) 626-6953.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may report the violation to the Fair Labor Division of the office of the Attorney General at (617) 727-3465.
- Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2019	\$35.35	\$12.41	\$13.72	\$0.00	\$61.48
	06/01/2020	\$36.25	\$12.41	\$13.72	\$0.00	\$62.38
	08/01/2020	\$36.25	\$12.91	\$13.72	\$0.00	\$62.88
	12/01/2020	\$36.25	\$12.91	\$14.82	\$0.00	\$63.98
	06/01/2021	\$37.05	\$12.91	\$14.82	\$0.00	\$64.78
	08/01/2021	\$37.05	\$13.41	\$14.82	\$0.00	\$65.28
	12/01/2021	\$37.05	\$13.41	\$16.01	\$0.00	\$66.47
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2019	\$35.42	\$12.41	\$13.72	\$0.00	\$61.55
	06/01/2020	\$36.32	\$12.41	\$13.72	\$0.00	\$62.45
	08/01/2020	\$36.32	\$12.91	\$13.72	\$0.00	\$62.95
	12/01/2020	\$36.32	\$12.91	\$14.82	\$0.00	\$64.05
	06/01/2021	\$37.12	\$12.91	\$14.82	\$0.00	\$64.85
	08/01/2021	\$37.12	\$13.41	\$14.82	\$0.00	\$65.35
	12/01/2021	\$37.12	\$13.41	\$16.01	\$0.00	\$66.54
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2019	\$35.54	\$12.41	\$13.72	\$0.00	\$61.67
	06/01/2020	\$36.44	\$12.41	\$13.72	\$0.00	\$62.57
	08/01/2020	\$36.44	\$12.91	\$13.72	\$0.00	\$63.07
	12/01/2020	\$36.44	\$12.91	\$14.82	\$0.00	\$64.17
	06/01/2021	\$37.24	\$12.91	\$14.82	\$0.00	\$64.97
	08/01/2021	\$37.24	\$13.41	\$14.82	\$0.00	\$65.47
	12/01/2021	\$37.24	\$13.41	\$16.01	\$0.00	\$66.66
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2019	\$102.78	\$9.90	\$21.15	\$0.00	\$133.83
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.90	\$8.10	\$16.60	\$0.00	\$64.60
	06/01/2020	\$40.89	\$8.10	\$16.60	\$0.00	\$65.59
	12/01/2020	\$41.87	\$8.10	\$16.60	\$0.00	\$66.57
	06/01/2021	\$42.89	\$8.10	\$16.60	\$0.00	\$67.59
	12/01/2021	\$43.90	\$8.10	\$16.60	\$0.00	\$68.60
For apprentice rates see "Apprentice- LABORER"						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	12/01/2019	\$37.00	\$12.50	\$8.85	\$0.00	\$58.35
	06/01/2020	\$38.00	\$12.50	\$8.85	\$0.00	\$59.35
	12/01/2020	\$39.00	\$12.50	\$8.85	\$0.00	\$60.35
ASPHALT RAKER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.73	\$12.50	\$15.70	\$0.00	\$76.93
	06/01/2020	\$49.83	\$12.50	\$15.70	\$0.00	\$78.03
	12/01/2020	\$50.98	\$12.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$52.08	\$12.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$53.23	\$12.50	\$15.70	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BACKHOE/FRONT-END LOADER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.73	\$12.50	\$15.70	\$0.00	\$76.93
	06/01/2020	\$49.83	\$12.50	\$15.70	\$0.00	\$78.03
	12/01/2020	\$50.98	\$12.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$52.08	\$12.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$53.23	\$12.50	\$15.70	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.90	\$8.10	\$16.60	\$0.00	\$64.60
	06/01/2020	\$40.89	\$8.10	\$16.60	\$0.00	\$65.59
	12/01/2020	\$41.87	\$8.10	\$16.60	\$0.00	\$66.57
	06/01/2021	\$42.89	\$8.10	\$16.60	\$0.00	\$67.59
	12/01/2021	\$43.90	\$8.10	\$16.60	\$0.00	\$68.60
For apprentice rates see "Apprentice- LABORER"						
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2020	\$46.10	\$7.07	\$17.98	\$0.00	\$71.15

Apprentice - BOILERMAKER - Local 29

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$29.97	\$7.07	\$11.69	\$0.00	\$48.73
2	65	\$29.97	\$7.07	\$11.69	\$0.00	\$48.73
3	70	\$32.27	\$7.07	\$12.59	\$0.00	\$51.93
4	75	\$34.58	\$7.07	\$13.49	\$0.00	\$55.14
5	80	\$36.88	\$7.07	\$14.38	\$0.00	\$58.33
6	85	\$39.19	\$7.07	\$15.29	\$0.00	\$61.55
7	90	\$41.49	\$7.07	\$16.18	\$0.00	\$64.74
8	95	\$43.80	\$7.07	\$17.09	\$0.00	\$67.96

Notes:

Apprentice to Journeyworker Ratio:1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) <i>BRICKLAYERS LOCAL 3 (WALTHAM)</i>	02/01/2020	\$54.40	\$10.75	\$21.94	\$0.00	\$87.09
	08/01/2020	\$55.75	\$10.75	\$22.09	\$0.00	\$88.59
	02/01/2021	\$56.39	\$10.75	\$22.09	\$0.00	\$89.23
	08/01/2021	\$57.79	\$10.75	\$22.25	\$0.00	\$90.79
	02/01/2022	\$58.38	\$10.75	\$22.25	\$0.00	\$91.38

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Waltham

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.20	\$10.75	\$21.94	\$0.00	\$59.89
2	60	\$32.64	\$10.75	\$21.94	\$0.00	\$65.33
3	70	\$38.08	\$10.75	\$21.94	\$0.00	\$70.77
4	80	\$43.52	\$10.75	\$21.94	\$0.00	\$76.21
5	90	\$48.96	\$10.75	\$21.94	\$0.00	\$81.65

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.88	\$10.75	\$22.09	\$0.00	\$60.72
2	60	\$33.45	\$10.75	\$22.09	\$0.00	\$66.29
3	70	\$39.03	\$10.75	\$22.09	\$0.00	\$71.87
4	80	\$44.60	\$10.75	\$22.09	\$0.00	\$77.44
5	90	\$50.18	\$10.75	\$22.09	\$0.00	\$83.02

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
<i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

CAISSON & UNDERPINNING BOTTOM MAN	12/01/2019	\$40.25	\$8.10	\$16.80	\$0.00	\$65.15
<i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2020	\$41.24	\$8.10	\$16.80	\$0.00	\$66.14
	12/01/2020	\$42.22	\$8.10	\$16.80	\$0.00	\$67.12
	06/01/2021	\$43.24	\$8.10	\$16.80	\$0.00	\$68.14
	12/01/2021	\$44.25	\$8.10	\$16.80	\$0.00	\$69.15

For apprentice rates see "Apprentice- LABORER"

CAISSON & UNDERPINNING LABORER	12/01/2019	\$39.10	\$8.10	\$16.80	\$0.00	\$64.00
<i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2020	\$40.09	\$8.10	\$16.80	\$0.00	\$64.99
	12/01/2020	\$41.07	\$8.10	\$16.80	\$0.00	\$65.97
	06/01/2021	\$42.09	\$8.10	\$16.80	\$0.00	\$66.99
	12/01/2021	\$43.10	\$8.10	\$16.80	\$0.00	\$68.00

For apprentice rates see "Apprentice- LABORER"

CAISSON & UNDERPINNING TOP MAN	12/01/2019	\$39.10	\$8.10	\$16.80	\$0.00	\$64.00
<i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2020	\$40.09	\$8.10	\$16.80	\$0.00	\$64.99
	12/01/2020	\$41.07	\$8.10	\$16.80	\$0.00	\$65.97
	06/01/2021	\$42.09	\$8.10	\$16.80	\$0.00	\$66.99
	12/01/2021	\$43.10	\$8.10	\$16.80	\$0.00	\$68.00

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10

For apprentice rates see "Apprentice- LABORER"

CARPENTER <i>CARPENTERS -ZONE 2 (Eastern Massachusetts)</i>	09/01/2019	\$41.90	\$9.40	\$18.95	\$0.00	\$70.25
	03/01/2020	\$42.50	\$9.40	\$18.95	\$0.00	\$70.85
	09/01/2020	\$43.15	\$9.40	\$18.95	\$0.00	\$71.50
	03/01/2021	\$43.75	\$9.40	\$18.95	\$0.00	\$72.10
	09/01/2021	\$44.40	\$9.40	\$18.95	\$0.00	\$72.75
	03/01/2022	\$45.00	\$9.40	\$18.95	\$0.00	\$73.35
	09/01/2022	\$45.65	\$9.40	\$18.95	\$0.00	\$74.00
	03/01/2023	\$46.25	\$9.40	\$18.95	\$0.00	\$74.60

Apprentice - CARPENTER - Zone 2 Eastern MA

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.95	\$9.40	\$1.73	\$0.00	\$32.08
2	60	\$25.14	\$9.40	\$1.73	\$0.00	\$36.27
3	70	\$29.33	\$9.40	\$13.76	\$0.00	\$52.49
4	75	\$31.43	\$9.40	\$13.76	\$0.00	\$54.59
5	80	\$33.52	\$9.40	\$15.49	\$0.00	\$58.41
6	80	\$33.52	\$9.40	\$15.49	\$0.00	\$58.41
7	90	\$37.71	\$9.40	\$17.22	\$0.00	\$64.33
8	90	\$37.71	\$9.40	\$17.22	\$0.00	\$64.33

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.25	\$9.40	\$1.73	\$0.00	\$32.38
2	60	\$25.50	\$9.40	\$1.73	\$0.00	\$36.63
3	70	\$29.75	\$9.40	\$13.76	\$0.00	\$52.91
4	75	\$31.88	\$9.40	\$13.76	\$0.00	\$55.04
5	80	\$34.00	\$9.40	\$15.49	\$0.00	\$58.89
6	80	\$34.00	\$9.40	\$15.49	\$0.00	\$58.89
7	90	\$38.25	\$9.40	\$17.22	\$0.00	\$64.87
8	90	\$38.25	\$9.40	\$17.22	\$0.00	\$64.87

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 \$29.99/ 3&4 \$35.85/ 5&6 \$54.22/ 7&8 \$60.14

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME <i>CARPENTERS -ZONE 2 (Wood Frame)</i>	10/01/2019	\$27.95	\$7.07	\$7.86	\$0.00	\$42.88
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All Aspects of New Wood Frame Work

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - CARPENTER (Wood Frame) - Zone 2

Effective Date - 10/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$16.77	\$7.07	\$0.00	\$0.00	\$23.84
2	60	\$16.77	\$7.07	\$0.00	\$0.00	\$23.84
3	65	\$18.17	\$7.07	\$7.86	\$0.00	\$33.10
4	70	\$19.57	\$7.07	\$7.86	\$0.00	\$34.50
5	75	\$20.96	\$7.07	\$7.86	\$0.00	\$35.89
6	80	\$22.36	\$7.07	\$7.86	\$0.00	\$37.29
7	85	\$23.76	\$7.07	\$7.86	\$0.00	\$38.69
8	90	\$25.16	\$7.07	\$7.86	\$0.00	\$40.09

Notes:
 % Indentured After 10/1/17; 45/45/55/55/70/70/80/80
 Step 1&2 \$19.65/ 3&4 \$27.19/ 5&6 \$34.50/ 7&8 \$37.29

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING BRICKLAYERS LOCAL 3 (WALTHAM)	01/01/2020	\$49.07	\$12.75	\$22.41	\$0.62	\$84.85
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Apprentice - CEMENT MASONRY/PLASTERING - Eastern Mass (Waltham)

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.54	\$12.75	\$15.41	\$0.00	\$52.70
2	60	\$29.44	\$12.75	\$17.41	\$0.62	\$60.22
3	65	\$31.90	\$12.75	\$18.41	\$0.62	\$63.68
4	70	\$34.35	\$12.75	\$19.41	\$0.62	\$67.13
5	75	\$36.80	\$12.75	\$20.41	\$0.62	\$70.58
6	80	\$39.26	\$12.75	\$21.41	\$0.62	\$74.04
7	90	\$44.16	\$12.75	\$22.41	\$0.62	\$79.94

Notes:
 Steps 3,4 are 500 hrs. All other steps are 1,000 hrs.

Apprentice to Journeyworker Ratio:1:3

CHAIN SAW OPERATOR LABORERS - ZONE 1	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10

For apprentice rates see "Apprentice- LABORER"

CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES OPERATING ENGINEERS LOCAL 4	12/01/2019	\$49.73	\$12.50	\$15.70	\$0.00	\$77.93
	06/01/2020	\$50.83	\$12.50	\$15.70	\$0.00	\$79.03
	12/01/2020	\$51.98	\$12.50	\$15.70	\$0.00	\$80.18
	06/01/2021	\$53.08	\$12.50	\$15.70	\$0.00	\$81.28
	12/01/2021	\$54.23	\$12.50	\$15.70	\$0.00	\$82.43

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$32.47	\$12.50	\$15.70	\$0.00	\$60.67
	06/01/2020	\$33.22	\$12.50	\$15.70	\$0.00	\$61.42
	12/01/2020	\$34.00	\$12.50	\$15.70	\$0.00	\$62.20
	06/01/2021	\$34.75	\$12.50	\$15.70	\$0.00	\$62.95
	12/01/2021	\$35.54	\$12.50	\$15.70	\$0.00	\$63.74

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) <i>PAINTERS LOCAL 35 - ZONE 2</i>	01/01/2020	\$50.96	\$8.20	\$22.10	\$0.00	\$81.26
	07/01/2020	\$52.06	\$8.20	\$22.10	\$0.00	\$82.36
	01/01/2021	\$53.16	\$8.20	\$22.10	\$0.00	\$83.46

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.48	\$8.20	\$0.00	\$0.00	\$33.68
2	55	\$28.03	\$8.20	\$5.94	\$0.00	\$42.17
3	60	\$30.58	\$8.20	\$6.48	\$0.00	\$45.26
4	65	\$33.12	\$8.20	\$7.02	\$0.00	\$48.34
5	70	\$35.67	\$8.20	\$18.86	\$0.00	\$62.73
6	75	\$38.22	\$8.20	\$19.40	\$0.00	\$65.82
7	80	\$40.77	\$8.20	\$19.94	\$0.00	\$68.91
8	90	\$45.86	\$8.20	\$21.02	\$0.00	\$75.08

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.03	\$8.20	\$0.00	\$0.00	\$34.23
2	55	\$28.63	\$8.20	\$5.94	\$0.00	\$42.77
3	60	\$31.24	\$8.20	\$6.48	\$0.00	\$45.92
4	65	\$33.84	\$8.20	\$7.02	\$0.00	\$49.06
5	70	\$36.44	\$8.20	\$18.86	\$0.00	\$63.50
6	75	\$39.05	\$8.20	\$19.40	\$0.00	\$66.65
7	80	\$41.65	\$8.20	\$19.94	\$0.00	\$69.79
8	90	\$46.85	\$8.20	\$21.02	\$0.00	\$76.07

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.30	\$8.10	\$16.60	\$0.00	\$64.00
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For apprentice rates see "Apprentice- LABORER"

DEMO: BACKHOE/LOADER/HAMMER OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2019	\$40.30	\$8.10	\$16.60	\$0.00	\$65.00
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For apprentice rates see "Apprentice- LABORER"

DEMO: BURNERS <i>LABORERS - ZONE 1</i>	12/01/2019	\$40.05	\$8.10	\$16.60	\$0.00	\$64.75
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For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: CONCRETE CUTTER/SAWYER <i>LABORERS - ZONE 1</i>	12/01/2019	\$40.30	\$8.10	\$16.60	\$0.00	\$65.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2019	\$40.05	\$8.10	\$16.60	\$0.00	\$64.75
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.30	\$8.10	\$16.60	\$0.00	\$64.00
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2019	\$68.52	\$9.90	\$21.15	\$0.00	\$99.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2019	\$48.94	\$9.90	\$21.15	\$0.00	\$79.99
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2019	\$73.41	\$9.90	\$21.15	\$0.00	\$104.46
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2019	\$102.78	\$9.90	\$21.15	\$0.00	\$133.83
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) <i>ELECTRICIANS LOCAL 103</i>	09/01/2019	\$53.01	\$13.00	\$18.94	\$0.00	\$84.95
	03/01/2020	\$53.50	\$13.00	\$19.20	\$0.00	\$85.70
	09/01/2020	\$54.93	\$13.00	\$19.25	\$0.00	\$87.18
	03/01/2021	\$56.13	\$13.00	\$19.28	\$0.00	\$88.41
	09/01/2021	\$57.56	\$13.00	\$19.33	\$0.00	\$89.89
	03/01/2022	\$58.76	\$13.00	\$19.36	\$0.00	\$91.12
	09/01/2022	\$60.19	\$13.00	\$19.41	\$0.00	\$92.60
	03/01/2023	\$61.39	\$13.00	\$19.44	\$0.00	\$93.83
For apprentice rates see "Apprentice- ELECTRICIAN"						
ELECTRICIAN <i>ELECTRICIANS LOCAL 103</i>	09/01/2019	\$53.01	\$13.00	\$18.94	\$0.00	\$84.95
	03/01/2020	\$53.50	\$13.00	\$19.20	\$0.00	\$85.70
	09/01/2020	\$54.93	\$13.00	\$19.25	\$0.00	\$87.18
	03/01/2021	\$56.13	\$13.00	\$19.28	\$0.00	\$88.41
	09/01/2021	\$57.56	\$13.00	\$19.33	\$0.00	\$89.89
	03/01/2022	\$58.76	\$13.00	\$19.36	\$0.00	\$91.12
	09/01/2022	\$60.19	\$13.00	\$19.41	\$0.00	\$92.60
	03/01/2023	\$61.39	\$13.00	\$19.44	\$0.00	\$93.83

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - ELECTRICIAN - Local 103

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$21.20	\$13.00	\$0.64	\$0.00	\$34.84
2	40	\$21.20	\$13.00	\$0.64	\$0.00	\$34.84
3	45	\$23.85	\$13.00	\$14.37	\$0.00	\$51.22
4	45	\$23.85	\$13.00	\$14.37	\$0.00	\$51.22
5	50	\$26.51	\$13.00	\$14.79	\$0.00	\$54.30
6	55	\$29.16	\$13.00	\$15.20	\$0.00	\$57.36
7	60	\$31.81	\$13.00	\$15.61	\$0.00	\$60.42
8	65	\$34.46	\$13.00	\$16.03	\$0.00	\$63.49
9	70	\$37.11	\$13.00	\$16.44	\$0.00	\$66.55
10	75	\$39.76	\$13.00	\$16.86	\$0.00	\$69.62

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$21.40	\$13.00	\$0.64	\$0.00	\$35.04
2	40	\$21.40	\$13.00	\$0.64	\$0.00	\$35.04
3	45	\$24.08	\$13.00	\$14.62	\$0.00	\$51.70
4	45	\$24.08	\$13.00	\$14.62	\$0.00	\$51.70
5	50	\$26.75	\$13.00	\$15.04	\$0.00	\$54.79
6	55	\$29.43	\$13.00	\$15.46	\$0.00	\$57.89
7	60	\$32.10	\$13.00	\$15.87	\$0.00	\$60.97
8	65	\$34.78	\$13.00	\$16.29	\$0.00	\$64.07
9	70	\$37.45	\$13.00	\$16.70	\$0.00	\$67.15
10	75	\$40.13	\$13.00	\$17.12	\$0.00	\$70.25

Notes :
 App Prior 1/1/03; 30/35/40/45/50/55/65/70/75/80

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR	01/01/2020	\$61.42	\$15.73	\$18.41	\$0.00	\$95.56
ELEVATOR CONSTRUCTORS LOCAL 4	01/01/2021	\$63.47	\$15.88	\$19.31	\$0.00	\$98.66
	01/01/2022	\$65.62	\$16.03	\$20.21	\$0.00	\$101.86

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - ELEVATOR CONSTRUCTOR - Local 4

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.71	\$15.73	\$0.00	\$0.00	\$46.44
2	55	\$33.78	\$15.73	\$18.41	\$0.00	\$67.92
3	65	\$39.92	\$15.73	\$18.41	\$0.00	\$74.06
4	70	\$42.99	\$15.73	\$18.41	\$0.00	\$77.13
5	80	\$49.14	\$15.73	\$18.41	\$0.00	\$83.28

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.74	\$15.88	\$0.00	\$0.00	\$47.62
2	55	\$34.91	\$15.88	\$19.31	\$0.00	\$70.10
3	65	\$41.26	\$15.88	\$19.31	\$0.00	\$76.45
4	70	\$44.43	\$15.88	\$19.31	\$0.00	\$79.62
5	80	\$50.78	\$15.88	\$19.31	\$0.00	\$85.97

Notes:

Steps 1-2 are 6 mos.; Steps 3-5 are 1 year

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER <i>ELEVATOR CONSTRUCTORS LOCAL 4</i>	01/01/2020	\$42.99	\$15.73	\$18.41	\$0.00	\$77.13
	01/01/2021	\$44.43	\$15.88	\$19.31	\$0.00	\$79.62
	01/01/2022	\$45.93	\$16.03	\$20.21	\$0.00	\$82.17
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2019	\$44.18	\$12.00	\$15.60	\$0.00	\$71.78
	05/01/2020	\$45.33	\$12.00	\$15.60	\$0.00	\$72.93
	11/01/2020	\$46.33	\$12.00	\$15.60	\$0.00	\$73.93
	05/01/2021	\$47.48	\$12.00	\$15.60	\$0.00	\$75.08
	11/01/2021	\$48.48	\$12.00	\$15.60	\$0.00	\$76.08
	05/01/2022	\$49.63	\$12.00	\$15.60	\$0.00	\$77.23
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2019	\$45.68	\$12.00	\$15.60	\$0.00	\$73.28
	05/01/2020	\$46.83	\$12.00	\$15.60	\$0.00	\$74.43
	11/01/2020	\$47.84	\$12.00	\$15.60	\$0.00	\$75.44
	05/01/2021	\$49.00	\$12.00	\$15.60	\$0.00	\$76.60
	11/01/2021	\$50.01	\$12.00	\$15.60	\$0.00	\$77.61
	05/01/2022	\$51.17	\$12.00	\$15.60	\$0.00	\$78.77
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	11/01/2019	\$22.57	\$12.00	\$15.60	\$0.00	\$50.17
	05/01/2020	\$23.24	\$12.00	\$15.60	\$0.00	\$50.84
	11/01/2020	\$23.83	\$12.00	\$15.60	\$0.00	\$51.43
	05/01/2021	\$24.51	\$12.00	\$15.60	\$0.00	\$52.11
	11/01/2021	\$25.11	\$12.00	\$15.60	\$0.00	\$52.71
	05/01/2022	\$25.78	\$12.00	\$15.60	\$0.00	\$53.38
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 103</i>	09/01/2019	\$53.01	\$13.00	\$18.94	\$0.00	\$84.95
	03/01/2020	\$53.50	\$13.00	\$19.20	\$0.00	\$85.70
	09/01/2020	\$54.93	\$13.00	\$19.25	\$0.00	\$87.18
	03/01/2021	\$56.13	\$13.00	\$19.28	\$0.00	\$88.41
	09/01/2021	\$57.56	\$13.00	\$19.33	\$0.00	\$89.89
	03/01/2022	\$58.76	\$13.00	\$19.36	\$0.00	\$91.12
	09/01/2022	\$60.19	\$13.00	\$19.41	\$0.00	\$92.60
	03/01/2023	\$61.39	\$13.00	\$19.44	\$0.00	\$93.83
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE <i>LOCAL 103</i> / COMMISSIONING <i>ELECTRICIANS</i>	09/01/2019	\$39.76	\$13.00	\$16.86	\$0.00	\$69.62
	03/01/2020	\$40.13	\$13.00	\$17.12	\$0.00	\$70.25
	09/01/2020	\$41.20	\$13.00	\$17.16	\$0.00	\$71.36
	03/01/2021	\$42.66	\$13.00	\$17.27	\$0.00	\$72.93
	09/01/2021	\$44.32	\$13.00	\$17.38	\$0.00	\$74.70
	03/01/2022	\$45.83	\$13.00	\$17.49	\$0.00	\$76.32
	09/01/2022	\$47.55	\$13.00	\$17.62	\$0.00	\$78.17
	03/01/2023	\$49.11	\$13.00	\$17.73	\$0.00	\$79.84
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$39.89	\$12.50	\$15.70	\$0.00	\$68.09
	06/01/2020	\$40.80	\$12.50	\$15.70	\$0.00	\$69.00
	12/01/2020	\$41.75	\$12.50	\$15.70	\$0.00	\$69.95
	06/01/2021	\$42.66	\$12.50	\$15.70	\$0.00	\$70.86
	12/01/2021	\$43.61	\$12.50	\$15.70	\$0.00	\$71.81
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER <i>LABORERS - ZONE 1</i>	12/01/2019	\$23.50	\$8.10	\$16.60	\$0.00	\$48.20
	06/01/2020	\$23.50	\$8.10	\$16.60	\$0.00	\$48.20
	12/01/2020	\$24.50	\$8.10	\$16.60	\$0.00	\$49.20
	06/01/2021	\$24.50	\$8.10	\$16.60	\$0.00	\$49.20
	12/01/2021	\$24.50	\$8.10	\$16.60	\$0.00	\$49.20
For apprentice rates see "Apprentice- LABORER"						
FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE 1</i>	09/01/2019	\$46.25	\$9.40	\$19.25	\$0.00	\$74.90
	03/01/2020	\$47.05	\$9.40	\$19.25	\$0.00	\$75.70
	09/01/2020	\$47.85	\$9.40	\$19.25	\$0.00	\$76.50
	03/01/2021	\$48.65	\$9.40	\$19.25	\$0.00	\$77.30
	09/01/2021	\$49.45	\$9.40	\$19.25	\$0.00	\$78.10
	03/01/2022	\$50.25	\$9.40	\$19.25	\$0.00	\$78.90

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - FLOORCOVERER - Local 2168 Zone I

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.13	\$9.40	\$1.79	\$0.00	\$34.32
2	55	\$25.44	\$9.40	\$1.79	\$0.00	\$36.63
3	60	\$27.75	\$9.40	\$13.88	\$0.00	\$51.03
4	65	\$30.06	\$9.40	\$13.88	\$0.00	\$53.34
5	70	\$32.38	\$9.40	\$15.67	\$0.00	\$57.45
6	75	\$34.69	\$9.40	\$15.67	\$0.00	\$59.76
7	80	\$37.00	\$9.40	\$17.46	\$0.00	\$63.86
8	85	\$39.31	\$9.40	\$17.46	\$0.00	\$66.17

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.53	\$9.40	\$1.79	\$0.00	\$34.72
2	55	\$25.88	\$9.40	\$1.79	\$0.00	\$37.07
3	60	\$28.23	\$9.40	\$13.88	\$0.00	\$51.51
4	65	\$30.58	\$9.40	\$13.88	\$0.00	\$53.86
5	70	\$32.94	\$9.40	\$15.67	\$0.00	\$58.01
6	75	\$35.29	\$9.40	\$15.67	\$0.00	\$60.36
7	80	\$37.64	\$9.40	\$17.46	\$0.00	\$64.50
8	85	\$39.99	\$9.40	\$17.46	\$0.00	\$66.85

Notes: Steps are 750 hrs.
 % After 09/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)
 Step 1&2 \$32.00/ 3&4 \$38.36/ 5&6 \$57.45/ 7&8 \$63.86

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.73	\$12.50	\$15.70	\$0.00	\$76.93
	06/01/2020	\$49.83	\$12.50	\$15.70	\$0.00	\$78.03
	12/01/2020	\$50.98	\$12.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$52.08	\$12.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$53.23	\$12.50	\$15.70	\$0.00	\$81.43

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

GENERATOR/LIGHTING PLANT/HEATERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$32.47	\$12.50	\$15.70	\$0.00	\$60.67
	06/01/2020	\$33.22	\$12.50	\$15.70	\$0.00	\$61.42
	12/01/2020	\$34.00	\$12.50	\$15.70	\$0.00	\$62.20
	06/01/2021	\$34.75	\$12.50	\$15.70	\$0.00	\$62.95
	12/01/2021	\$35.54	\$12.50	\$15.70	\$0.00	\$63.74

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) <i>GLAZIERS LOCAL 35 (ZONE 2)</i>	01/01/2020	\$40.46	\$8.20	\$22.10	\$0.00	\$70.76
	07/01/2020	\$41.56	\$8.20	\$22.10	\$0.00	\$71.86
	01/01/2021	\$42.66	\$8.20	\$22.10	\$0.00	\$72.96

Apprentice - GLAZIER - Local 35 Zone 2

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.23	\$8.20	\$0.00	\$0.00	\$28.43
2	55	\$22.25	\$8.20	\$5.94	\$0.00	\$36.39
3	60	\$24.28	\$8.20	\$6.48	\$0.00	\$38.96
4	65	\$26.30	\$8.20	\$7.02	\$0.00	\$41.52
5	70	\$28.32	\$8.20	\$18.86	\$0.00	\$55.38
6	75	\$30.35	\$8.20	\$19.40	\$0.00	\$57.95
7	80	\$32.37	\$8.20	\$19.94	\$0.00	\$60.51
8	90	\$36.41	\$8.20	\$21.02	\$0.00	\$65.63

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.78	\$8.20	\$0.00	\$0.00	\$28.98
2	55	\$22.86	\$8.20	\$5.94	\$0.00	\$37.00
3	60	\$24.94	\$8.20	\$6.48	\$0.00	\$39.62
4	65	\$27.01	\$8.20	\$7.02	\$0.00	\$42.23
5	70	\$29.09	\$8.20	\$18.86	\$0.00	\$56.15
6	75	\$31.17	\$8.20	\$19.40	\$0.00	\$58.77
7	80	\$33.25	\$8.20	\$19.94	\$0.00	\$61.39
8	90	\$37.40	\$8.20	\$21.02	\$0.00	\$66.62

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

HOISTING ENGINEER/CRANES/GRADALLS	12/01/2019	\$48.73	\$12.50	\$15.70	\$0.00	\$76.93
OPERATING ENGINEERS LOCAL 4	06/01/2020	\$49.83	\$12.50	\$15.70	\$0.00	\$78.03
	12/01/2020	\$50.98	\$12.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$52.08	\$12.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$53.23	\$12.50	\$15.70	\$0.00	\$81.43

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - OPERATING ENGINEERS - Local 4

Effective Date - 12/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$26.80	\$12.50	\$0.00	\$0.00	\$39.30
2	60	\$29.24	\$12.50	\$15.70	\$0.00	\$57.44
3	65	\$31.67	\$12.50	\$15.70	\$0.00	\$59.87
4	70	\$34.11	\$12.50	\$15.70	\$0.00	\$62.31
5	75	\$36.55	\$12.50	\$15.70	\$0.00	\$64.75
6	80	\$38.98	\$12.50	\$15.70	\$0.00	\$67.18
7	85	\$41.42	\$12.50	\$15.70	\$0.00	\$69.62
8	90	\$43.86	\$12.50	\$15.70	\$0.00	\$72.06

Effective Date - 06/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$27.41	\$12.50	\$0.00	\$0.00	\$39.91
2	60	\$29.90	\$12.50	\$15.70	\$0.00	\$58.10
3	65	\$32.39	\$12.50	\$15.70	\$0.00	\$60.59
4	70	\$34.88	\$12.50	\$15.70	\$0.00	\$63.08
5	75	\$37.37	\$12.50	\$15.70	\$0.00	\$65.57
6	80	\$39.86	\$12.50	\$15.70	\$0.00	\$68.06
7	85	\$42.36	\$12.50	\$15.70	\$0.00	\$70.56
8	90	\$44.85	\$12.50	\$15.70	\$0.00	\$73.05

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) SHEETMETAL WORKERS LOCAL 17 - A	02/01/2020	\$49.36	\$13.35	\$24.12	\$2.61	\$89.44
	08/01/2020	\$50.96	\$13.35	\$24.12	\$2.66	\$91.09
	02/01/2021	\$52.61	\$13.35	\$24.12	\$2.71	\$92.79
	08/01/2021	\$54.36	\$13.35	\$24.12	\$2.76	\$94.59
	02/01/2022	\$56.11	\$13.35	\$24.12	\$2.81	\$96.39

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (ELECTRICAL CONTROLS) ELECTRICIANS LOCAL 103	09/01/2019	\$53.01	\$13.00	\$18.94	\$0.00	\$84.95
	03/01/2020	\$53.50	\$13.00	\$19.20	\$0.00	\$85.70
	09/01/2020	\$54.93	\$13.00	\$19.25	\$0.00	\$87.18
	03/01/2021	\$56.13	\$13.00	\$19.28	\$0.00	\$88.41
	09/01/2021	\$57.56	\$13.00	\$19.33	\$0.00	\$89.89
	03/01/2022	\$58.76	\$13.00	\$19.36	\$0.00	\$91.12
	09/01/2022	\$60.19	\$13.00	\$19.41	\$0.00	\$92.60
	03/01/2023	\$61.39	\$13.00	\$19.44	\$0.00	\$93.83

For apprentice rates see "Apprentice- ELECTRICIAN"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2020	\$49.36	\$13.35	\$24.12	\$2.61	\$89.44
	08/01/2020	\$50.96	\$13.35	\$24.12	\$2.66	\$91.09
	02/01/2021	\$52.61	\$13.35	\$24.12	\$2.71	\$92.79
	08/01/2021	\$54.36	\$13.35	\$24.12	\$2.76	\$94.59
	02/01/2022	\$56.11	\$13.35	\$24.12	\$2.81	\$96.39
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) <i>PIPEFITTERS LOCAL 537</i>	09/01/2019	\$54.69	\$10.95	\$19.74	\$0.00	\$85.38
	03/01/2020	\$56.19	\$10.95	\$19.74	\$0.00	\$86.88
	09/01/2020	\$57.69	\$10.95	\$19.74	\$0.00	\$88.38
	03/01/2021	\$59.19	\$10.95	\$19.74	\$0.00	\$89.88
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC <i>PIPEFITTERS LOCAL 537</i>	09/01/2019	\$54.69	\$10.95	\$19.74	\$0.00	\$85.38
	03/01/2020	\$56.19	\$10.95	\$19.74	\$0.00	\$86.88
	09/01/2020	\$57.69	\$10.95	\$19.74	\$0.00	\$88.38
	03/01/2021	\$59.19	\$10.95	\$19.74	\$0.00	\$89.88
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.90	\$8.10	\$16.60	\$0.00	\$64.60
	06/01/2020	\$40.89	\$8.10	\$16.60	\$0.00	\$65.59
	12/01/2020	\$41.87	\$8.10	\$16.60	\$0.00	\$66.57
	06/01/2021	\$42.89	\$8.10	\$16.60	\$0.00	\$67.59
	12/01/2021	\$43.90	\$8.10	\$16.60	\$0.00	\$68.60
For apprentice rates see "Apprentice- LABORER"						
INSULATOR (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	09/01/2019	\$48.44	\$12.80	\$16.40	\$0.00	\$77.64

Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Boston

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.22	\$12.80	\$11.90	\$0.00	\$48.92
2	60	\$29.06	\$12.80	\$12.80	\$0.00	\$54.66
3	70	\$33.91	\$12.80	\$13.70	\$0.00	\$60.41
4	80	\$38.75	\$12.80	\$14.60	\$0.00	\$66.15

Notes:

Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER <i>IRONWORKERS LOCAL 7 (BOSTON AREA)</i>	03/16/2019	\$46.66	\$8.00	\$23.50	\$0.00	\$78.16
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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - IRONWORKER - Local 7 Boston

Effective Date - 03/16/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$28.00	\$8.00	\$23.50	\$0.00	\$59.50
2	70	\$32.66	\$8.00	\$23.50	\$0.00	\$64.16
3	75	\$35.00	\$8.00	\$23.50	\$0.00	\$66.50
4	80	\$37.33	\$8.00	\$23.50	\$0.00	\$68.83
5	85	\$39.66	\$8.00	\$23.50	\$0.00	\$71.16
6	90	\$41.99	\$8.00	\$23.50	\$0.00	\$73.49

Notes:

** Structural 1:6; Ornamental 1:4

Apprentice to Journeyworker Ratio:**

JACKHAMMER & PAVING BREAKER OPERATOR LABORERS - ZONE 1	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10

For apprentice rates see "Apprentice- LABORER"

LABORER LABORERS - ZONE 1	12/01/2019	\$39.15	\$8.10	\$16.60	\$0.00	\$63.85
	06/01/2020	\$40.14	\$8.10	\$16.60	\$0.00	\$64.84
	12/01/2020	\$41.12	\$8.10	\$16.60	\$0.00	\$65.82
	06/01/2021	\$42.14	\$8.10	\$16.60	\$0.00	\$66.84
	12/01/2021	\$43.15	\$8.10	\$16.60	\$0.00	\$67.85

Apprentice - LABORER - Zone 1

Effective Date - 12/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.49	\$8.10	\$16.60	\$0.00	\$48.19
2	70	\$27.41	\$8.10	\$16.60	\$0.00	\$52.11
3	80	\$31.32	\$8.10	\$16.60	\$0.00	\$56.02
4	90	\$35.24	\$8.10	\$16.60	\$0.00	\$59.94

Effective Date - 06/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$24.08	\$8.10	\$16.60	\$0.00	\$48.78
2	70	\$28.10	\$8.10	\$16.60	\$0.00	\$52.80
3	80	\$32.11	\$8.10	\$16.60	\$0.00	\$56.81
4	90	\$36.13	\$8.10	\$16.60	\$0.00	\$60.83

Notes:

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: CARPENTER TENDER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.15	\$8.10	\$16.60	\$0.00	\$63.85
	06/01/2020	\$40.14	\$8.10	\$16.60	\$0.00	\$64.84
	12/01/2020	\$41.12	\$8.10	\$16.60	\$0.00	\$65.82
	06/01/2021	\$42.14	\$8.10	\$16.60	\$0.00	\$66.84
	12/01/2021	\$43.15	\$8.10	\$16.60	\$0.00	\$67.85
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.15	\$8.10	\$16.60	\$0.00	\$63.85
	06/01/2020	\$40.14	\$8.10	\$16.60	\$0.00	\$64.84
	12/01/2020	\$41.12	\$8.10	\$16.60	\$0.00	\$65.82
	06/01/2021	\$42.14	\$8.10	\$16.60	\$0.00	\$66.84
	12/01/2021	\$43.15	\$8.10	\$16.60	\$0.00	\$67.85
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.30	\$8.10	\$16.60	\$0.00	\$64.00
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.15	\$8.10	\$16.60	\$0.00	\$63.85
	06/01/2020	\$40.14	\$8.10	\$16.60	\$0.00	\$64.84
	12/01/2020	\$41.12	\$8.10	\$16.60	\$0.00	\$65.82
	06/01/2021	\$42.14	\$8.10	\$16.60	\$0.00	\$66.84
	12/01/2021	\$43.15	\$8.10	\$16.60	\$0.00	\$67.85
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.15	\$8.10	\$16.60	\$0.00	\$63.85
	06/01/2020	\$40.14	\$8.10	\$16.60	\$0.00	\$64.84
	12/01/2020	\$41.12	\$8.10	\$16.60	\$0.00	\$65.82
	06/01/2021	\$42.14	\$8.10	\$16.60	\$0.00	\$66.84
	12/01/2021	\$43.15	\$8.10	\$16.60	\$0.00	\$67.85
This classification applies to all tree work associated with the removal of standing trees, and trimming and removal of branches and limbs when the work is not done for a utility company for the purpose of operation, maintenance or repair of utility company equipment. For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2020	\$41.49	\$10.75	\$20.12	\$0.00	\$72.36
	08/01/2020	\$42.57	\$10.75	\$20.27	\$0.00	\$73.59
	02/01/2021	\$43.08	\$10.75	\$20.27	\$0.00	\$74.10
	08/01/2021	\$44.20	\$10.75	\$20.43	\$0.00	\$75.38
	02/01/2022	\$44.67	\$10.75	\$20.43	\$0.00	\$75.85

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - MARBLE & TILE FINISHER - Local 3 Marble & Tile

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.75	\$10.75	\$20.12	\$0.00	\$51.62
2	60	\$24.89	\$10.75	\$20.12	\$0.00	\$55.76
3	70	\$29.04	\$10.75	\$20.12	\$0.00	\$59.91
4	80	\$33.19	\$10.75	\$20.12	\$0.00	\$64.06
5	90	\$37.34	\$10.75	\$20.12	\$0.00	\$68.21

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.29	\$10.75	\$20.27	\$0.00	\$52.31
2	60	\$25.54	\$10.75	\$20.27	\$0.00	\$56.56
3	70	\$29.80	\$10.75	\$20.27	\$0.00	\$60.82
4	80	\$34.06	\$10.75	\$20.27	\$0.00	\$65.08
5	90	\$38.31	\$10.75	\$20.27	\$0.00	\$69.33

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS, TILELAYERS & TERRAZZO MECH	02/01/2020	\$54.42	\$10.75	\$21.93	\$0.00	\$87.10
BRICKLAYERS LOCAL 3 - MARBLE & TILE	08/01/2020	\$55.77	\$10.75	\$22.08	\$0.00	\$88.60
	02/01/2021	\$56.41	\$10.75	\$22.08	\$0.00	\$89.24
	08/01/2021	\$57.81	\$10.75	\$22.24	\$0.00	\$90.80
	02/01/2022	\$58.38	\$10.75	\$22.24	\$0.00	\$91.37

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - MARBLE-TILE-TERRAZZO MECHANIC - Local 3 Marble & Tile

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.21	\$10.75	\$21.93	\$0.00	\$59.89
2	60	\$32.65	\$10.75	\$21.93	\$0.00	\$65.33
3	70	\$38.09	\$10.75	\$21.93	\$0.00	\$70.77
4	80	\$43.54	\$10.75	\$21.93	\$0.00	\$76.22
5	90	\$48.98	\$10.75	\$21.93	\$0.00	\$81.66

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.89	\$10.75	\$22.08	\$0.00	\$60.72
2	60	\$33.46	\$10.75	\$22.08	\$0.00	\$66.29
3	70	\$39.04	\$10.75	\$22.08	\$0.00	\$71.87
4	80	\$44.62	\$10.75	\$22.08	\$0.00	\$77.45
5	90	\$50.19	\$10.75	\$22.08	\$0.00	\$83.02

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MECHANICS MAINTENANCE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MILLWRIGHT (Zone 1) <i>MILLWRIGHTS LOCAL 1121 - Zone 1</i>	04/01/2019	\$42.22	\$9.90	\$18.50	\$0.00	\$70.62
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Apprentice - MILLWRIGHT - Local 1121 Zone 1

Effective Date - 04/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$23.22	\$9.90	\$5.31	\$0.00	\$38.43
2	65	\$27.44	\$9.90	\$15.13	\$0.00	\$52.47
3	75	\$31.67	\$9.90	\$16.10	\$0.00	\$57.67
4	85	\$35.89	\$9.90	\$17.06	\$0.00	\$62.85

Notes:

Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:5

MORTAR MIXER LABORERS - ZONE 1	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10

For apprentice rates see "Apprentice- LABORER"

OILER (OTHER THAN TRUCK CRANES,GRADALLS) OPERATING ENGINEERS LOCAL 4	12/01/2019	\$23.08	\$12.50	\$15.70	\$0.00	\$51.28
	06/01/2020	\$23.63	\$12.50	\$15.70	\$0.00	\$51.83
	12/01/2020	\$24.20	\$12.50	\$15.70	\$0.00	\$52.40
	06/01/2021	\$24.75	\$12.50	\$15.70	\$0.00	\$52.95
	12/01/2021	\$25.33	\$12.50	\$15.70	\$0.00	\$53.53

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

OILER (TRUCK CRANES, GRADALLS) OPERATING ENGINEERS LOCAL 4	12/01/2019	\$27.64	\$12.50	\$15.70	\$0.00	\$55.84
	06/01/2020	\$28.29	\$12.50	\$15.70	\$0.00	\$56.49
	12/01/2020	\$28.97	\$12.50	\$15.70	\$0.00	\$57.17
	06/01/2021	\$29.61	\$12.50	\$15.70	\$0.00	\$57.81
	12/01/2021	\$30.29	\$12.50	\$15.70	\$0.00	\$58.49

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

OTHER POWER DRIVEN EQUIPMENT - CLASS II OPERATING ENGINEERS LOCAL 4	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

PAINTER (BRIDGES/TANKS) PAINTERS LOCAL 35 - ZONE 2	01/01/2020	\$50.96	\$8.20	\$22.10	\$0.00	\$81.26
	07/01/2020	\$52.06	\$8.20	\$22.10	\$0.00	\$82.36
	01/01/2021	\$53.16	\$8.20	\$22.10	\$0.00	\$83.46

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.48	\$8.20	\$0.00	\$0.00	\$33.68
2	55	\$28.03	\$8.20	\$5.94	\$0.00	\$42.17
3	60	\$30.58	\$8.20	\$6.48	\$0.00	\$45.26
4	65	\$33.12	\$8.20	\$7.02	\$0.00	\$48.34
5	70	\$35.67	\$8.20	\$18.86	\$0.00	\$62.73
6	75	\$38.22	\$8.20	\$19.40	\$0.00	\$65.82
7	80	\$40.77	\$8.20	\$19.94	\$0.00	\$68.91
8	90	\$45.86	\$8.20	\$21.02	\$0.00	\$75.08

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.03	\$8.20	\$0.00	\$0.00	\$34.23
2	55	\$28.63	\$8.20	\$5.94	\$0.00	\$42.77
3	60	\$31.24	\$8.20	\$6.48	\$0.00	\$45.92
4	65	\$33.84	\$8.20	\$7.02	\$0.00	\$49.06
5	70	\$36.44	\$8.20	\$18.86	\$0.00	\$63.50
6	75	\$39.05	\$8.20	\$19.40	\$0.00	\$66.65
7	80	\$41.65	\$8.20	\$19.94	\$0.00	\$69.79
8	90	\$46.85	\$8.20	\$21.02	\$0.00	\$76.07

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SIGN, PICTORIAL & DISPLAY) PAINTERS LOCAL 35 - ZONE 2	06/01/2013	\$25.81	\$7.07	\$7.05	\$0.00	\$39.93
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Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER SIGN - Local 35 Zone 2

Effective Date - 06/01/2013

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$12.91	\$7.07	\$0.00	\$0.00	\$19.98
2	55	\$14.20	\$7.07	\$2.45	\$0.00	\$23.72
3	60	\$15.49	\$7.07	\$2.45	\$0.00	\$25.01
4	65	\$16.78	\$7.07	\$2.45	\$0.00	\$26.30
5	70	\$18.07	\$7.07	\$7.05	\$0.00	\$32.19
6	75	\$19.36	\$7.07	\$7.05	\$0.00	\$33.48
7	80	\$20.65	\$7.07	\$7.05	\$0.00	\$34.77
8	85	\$21.94	\$7.07	\$7.05	\$0.00	\$36.06
9	90	\$23.23	\$7.07	\$7.05	\$0.00	\$37.35

Notes:
Steps are 4 mos.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *	01/01/2020	\$41.86	\$8.20	\$22.10	\$0.00	\$72.16
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2	07/01/2020	\$42.96	\$8.20	\$22.10	\$0.00	\$73.26
	01/01/2021	\$44.06	\$8.20	\$22.10	\$0.00	\$74.36

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - New

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.93	\$8.20	\$0.00	\$0.00	\$29.13
2	55	\$23.02	\$8.20	\$5.94	\$0.00	\$37.16
3	60	\$25.12	\$8.20	\$6.48	\$0.00	\$39.80
4	65	\$27.21	\$8.20	\$7.02	\$0.00	\$42.43
5	70	\$29.30	\$8.20	\$18.86	\$0.00	\$56.36
6	75	\$31.40	\$8.20	\$19.40	\$0.00	\$59.00
7	80	\$33.49	\$8.20	\$19.94	\$0.00	\$61.63
8	90	\$37.67	\$8.20	\$21.02	\$0.00	\$66.89

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.48	\$8.20	\$0.00	\$0.00	\$29.68
2	55	\$23.63	\$8.20	\$5.94	\$0.00	\$37.77
3	60	\$25.78	\$8.20	\$6.48	\$0.00	\$40.46
4	65	\$27.92	\$8.20	\$7.02	\$0.00	\$43.14
5	70	\$30.07	\$8.20	\$18.86	\$0.00	\$57.13
6	75	\$32.22	\$8.20	\$19.40	\$0.00	\$59.82
7	80	\$34.37	\$8.20	\$19.94	\$0.00	\$62.51
8	90	\$38.66	\$8.20	\$21.02	\$0.00	\$67.88

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT)	01/01/2020	\$39.92	\$8.20	\$22.10	\$0.00	\$70.22
PAINTERS LOCAL 35 - ZONE 2	07/01/2020	\$41.02	\$8.20	\$22.10	\$0.00	\$71.32
	01/01/2021	\$42.12	\$8.20	\$22.10	\$0.00	\$72.42

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.96	\$8.20	\$0.00	\$0.00	\$28.16
2	55	\$21.96	\$8.20	\$5.94	\$0.00	\$36.10
3	60	\$23.95	\$8.20	\$6.48	\$0.00	\$38.63
4	65	\$25.95	\$8.20	\$7.02	\$0.00	\$41.17
5	70	\$27.94	\$8.20	\$18.86	\$0.00	\$55.00
6	75	\$29.94	\$8.20	\$19.40	\$0.00	\$57.54
7	80	\$31.94	\$8.20	\$19.94	\$0.00	\$60.08
8	90	\$35.93	\$8.20	\$21.02	\$0.00	\$65.15

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.51	\$8.20	\$0.00	\$0.00	\$28.71
2	55	\$22.56	\$8.20	\$5.94	\$0.00	\$36.70
3	60	\$24.61	\$8.20	\$6.48	\$0.00	\$39.29
4	65	\$26.66	\$8.20	\$7.02	\$0.00	\$41.88
5	70	\$28.71	\$8.20	\$18.86	\$0.00	\$55.77
6	75	\$30.77	\$8.20	\$19.40	\$0.00	\$58.37
7	80	\$32.82	\$8.20	\$19.94	\$0.00	\$60.96
8	90	\$36.92	\$8.20	\$21.02	\$0.00	\$66.14

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (TRAFFIC MARKINGS)	12/01/2019	\$39.15	\$8.10	\$16.60	\$0.00	\$63.85
LABORERS - ZONE 1	06/01/2020	\$40.14	\$8.10	\$16.60	\$0.00	\$64.84
	12/01/2020	\$41.12	\$8.10	\$16.60	\$0.00	\$65.82
	06/01/2021	\$42.14	\$8.10	\$16.60	\$0.00	\$66.84
	12/01/2021	\$43.15	\$8.10	\$16.60	\$0.00	\$67.85
For Apprentice rates see "Apprentice- LABORER"						
PAINTER / TAPER (BRUSH, NEW) *	01/01/2020	\$40.46	\$8.20	\$22.10	\$0.00	\$70.76
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2	07/01/2020	\$41.56	\$8.20	\$22.10	\$0.00	\$71.86
	01/01/2021	\$42.66	\$8.20	\$22.10	\$0.00	\$72.96

Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.23	\$8.20	\$0.00	\$0.00	\$28.43
2	55	\$22.25	\$8.20	\$5.94	\$0.00	\$36.39
3	60	\$24.28	\$8.20	\$6.48	\$0.00	\$38.96
4	65	\$26.30	\$8.20	\$7.02	\$0.00	\$41.52
5	70	\$28.32	\$8.20	\$18.86	\$0.00	\$55.38
6	75	\$30.35	\$8.20	\$19.40	\$0.00	\$57.95
7	80	\$32.37	\$8.20	\$19.94	\$0.00	\$60.51
8	90	\$36.41	\$8.20	\$21.02	\$0.00	\$65.63

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.78	\$8.20	\$0.00	\$0.00	\$28.98
2	55	\$22.86	\$8.20	\$5.94	\$0.00	\$37.00
3	60	\$24.94	\$8.20	\$6.48	\$0.00	\$39.62
4	65	\$27.01	\$8.20	\$7.02	\$0.00	\$42.23
5	70	\$29.09	\$8.20	\$18.86	\$0.00	\$56.15
6	75	\$31.17	\$8.20	\$19.40	\$0.00	\$58.77
7	80	\$33.25	\$8.20	\$19.94	\$0.00	\$61.39
8	90	\$37.40	\$8.20	\$21.02	\$0.00	\$66.62

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT)	01/01/2020	\$38.52	\$8.20	\$22.10	\$0.00	\$68.82
PAINTERS LOCAL 35 - ZONE 2	07/01/2020	\$39.62	\$8.20	\$22.10	\$0.00	\$69.92
	01/01/2021	\$40.72	\$8.20	\$22.10	\$0.00	\$71.02

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - PAINTER Local 35 Zone 2 - BRUSH REPAINT

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.26	\$8.20	\$0.00	\$0.00	\$27.46
2	55	\$21.19	\$8.20	\$5.94	\$0.00	\$35.33
3	60	\$23.11	\$8.20	\$6.48	\$0.00	\$37.79
4	65	\$25.04	\$8.20	\$7.02	\$0.00	\$40.26
5	70	\$26.96	\$8.20	\$18.86	\$0.00	\$54.02
6	75	\$28.89	\$8.20	\$19.40	\$0.00	\$56.49
7	80	\$30.82	\$8.20	\$19.94	\$0.00	\$58.96
8	90	\$34.67	\$8.20	\$21.02	\$0.00	\$63.89

Effective Date - 07/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.81	\$8.20	\$0.00	\$0.00	\$28.01
2	55	\$21.79	\$8.20	\$5.94	\$0.00	\$35.93
3	60	\$23.77	\$8.20	\$6.48	\$0.00	\$38.45
4	65	\$25.75	\$8.20	\$7.02	\$0.00	\$40.97
5	70	\$27.73	\$8.20	\$18.86	\$0.00	\$54.79
6	75	\$29.72	\$8.20	\$19.40	\$0.00	\$57.32
7	80	\$31.70	\$8.20	\$19.94	\$0.00	\$59.84
8	90	\$35.66	\$8.20	\$21.02	\$0.00	\$64.88

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PANEL & PICKUP TRUCKS DRIVER <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2019	\$35.18	\$12.41	\$13.72	\$0.00	\$61.31
	06/01/2020	\$36.08	\$12.41	\$13.72	\$0.00	\$62.21
	08/01/2020	\$36.08	\$12.91	\$13.72	\$0.00	\$62.71
	12/01/2020	\$36.08	\$12.91	\$14.82	\$0.00	\$63.81
	06/01/2021	\$36.88	\$12.91	\$14.82	\$0.00	\$64.61
	08/01/2021	\$36.88	\$13.41	\$14.82	\$0.00	\$65.11
	12/01/2021	\$36.88	\$13.41	\$16.01	\$0.00	\$66.30
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i> For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2019	\$48.94	\$9.90	\$21.15	\$0.00	\$79.99
PILE DRIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2019	\$48.94	\$9.90	\$21.15	\$0.00	\$79.99

Apprentice - PILE DRIVER - Local 56 Zone 1

Effective Date - 08/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.47	\$9.90	\$21.15	\$0.00	\$55.52
2	60	\$29.36	\$9.90	\$21.15	\$0.00	\$60.41
3	70	\$34.26	\$9.90	\$21.15	\$0.00	\$65.31
4	75	\$36.71	\$9.90	\$21.15	\$0.00	\$67.76
5	80	\$39.15	\$9.90	\$21.15	\$0.00	\$70.20
6	80	\$39.15	\$9.90	\$21.15	\$0.00	\$70.20
7	90	\$44.05	\$9.90	\$21.15	\$0.00	\$75.10
8	90	\$44.05	\$9.90	\$21.15	\$0.00	\$75.10

Notes:

Apprentice to Journeyworker Ratio:1:5

PIPEFITTER & STEAMFITTER	09/01/2019	\$54.69	\$10.95	\$19.74	\$0.00	\$85.38
PIPEFITTERS LOCAL 537	03/01/2020	\$56.19	\$10.95	\$19.74	\$0.00	\$86.88
	09/01/2020	\$57.69	\$10.95	\$19.74	\$0.00	\$88.38
	03/01/2021	\$59.19	\$10.95	\$19.74	\$0.00	\$89.88

Apprentice - PIPEFITTER - Local 537

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$21.88	\$10.95	\$8.00	\$0.00	\$40.83
2	45	\$24.61	\$10.95	\$19.74	\$0.00	\$55.30
3	60	\$32.81	\$10.95	\$19.74	\$0.00	\$63.50
4	70	\$38.28	\$10.95	\$19.74	\$0.00	\$68.97
5	80	\$43.75	\$10.95	\$19.74	\$0.00	\$74.44

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$22.48	\$10.95	\$8.00	\$0.00	\$41.43
2	45	\$25.29	\$10.95	\$19.74	\$0.00	\$55.98
3	60	\$33.71	\$10.95	\$19.74	\$0.00	\$64.40
4	70	\$39.33	\$10.95	\$19.74	\$0.00	\$70.02
5	80	\$44.95	\$10.95	\$19.74	\$0.00	\$75.64

Notes:
 ** 1:3; 3:15; 1:10 thereafter / Steps are 1 yr.
 Refrig/AC Mechanic **1:1;1:2;2:4;3:6;4:8;5:10;6:12;7:14;8:17;9:20;10:23(Max)

Apprentice to Journeyworker Ratio:**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIPELAYER <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10

For apprentice rates see "Apprentice- LABORER"

PLUMBERS & GASFITTERS <i>PLUMBERS & GASFITTERS LOCAL 12</i>	09/01/2019	\$57.69	\$11.82	\$17.01	\$0.00	\$86.52
	03/01/2020	\$58.69	\$12.07	\$17.26	\$0.00	\$88.02
	09/01/2020	\$60.19	\$12.07	\$17.26	\$0.00	\$89.52
	03/01/2021	\$61.69	\$12.07	\$17.26	\$0.00	\$91.02

Apprentice - PLUMBER/GASFITTER - Local 12

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$20.19	\$11.82	\$6.16	\$0.00	\$38.17
2	40	\$23.08	\$11.82	\$6.99	\$0.00	\$41.89
3	55	\$31.73	\$11.82	\$9.53	\$0.00	\$53.08
4	65	\$37.50	\$11.82	\$11.18	\$0.00	\$60.50
5	75	\$43.27	\$11.82	\$12.88	\$0.00	\$67.97

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$20.54	\$12.07	\$6.24	\$0.00	\$38.85
2	40	\$23.48	\$12.07	\$7.08	\$0.00	\$42.63
3	55	\$32.28	\$12.07	\$9.63	\$0.00	\$53.98
4	65	\$38.15	\$12.07	\$11.33	\$0.00	\$61.55
5	75	\$44.02	\$12.07	\$13.03	\$0.00	\$69.12

Notes:

** 1:2; 2:6; 3:10; 4:14; 5:19/Steps are 1 yr
Step4 with lic\$64.20, Step5 with lic\$71.67

Apprentice to Journeyworker Ratio:**

PNEUMATIC CONTROLS (TEMP.) <i>PIPEFITTERS LOCAL 537</i>	09/01/2019	\$54.69	\$10.95	\$19.74	\$0.00	\$85.38
	03/01/2020	\$56.19	\$10.95	\$19.74	\$0.00	\$86.88
	09/01/2020	\$57.69	\$10.95	\$19.74	\$0.00	\$88.38
	03/01/2021	\$59.17	\$10.95	\$19.74	\$0.00	\$89.86

For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

PNEUMATIC DRILL/TOOL OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
POWDERMAN & BLASTER <i>LABORERS - ZONE 1</i>	12/01/2019	\$40.15	\$8.10	\$16.60	\$0.00	\$64.85
	06/01/2020	\$41.14	\$8.10	\$16.60	\$0.00	\$65.84
	12/01/2020	\$42.12	\$8.10	\$16.60	\$0.00	\$66.82
	06/01/2021	\$43.14	\$8.10	\$16.60	\$0.00	\$67.84
	12/01/2021	\$44.15	\$8.10	\$16.60	\$0.00	\$68.85
For apprentice rates see "Apprentice- LABORER"						
POWER SHOVEL/DERRICK/TRENCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.73	\$12.50	\$15.70	\$0.00	\$76.93
	06/01/2020	\$49.83	\$12.50	\$15.70	\$0.00	\$78.03
	12/01/2020	\$50.98	\$12.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$52.08	\$12.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$53.23	\$12.50	\$15.70	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.73	\$12.50	\$15.70	\$0.00	\$76.93
	06/01/2020	\$49.83	\$12.50	\$15.70	\$0.00	\$78.03
	12/01/2020	\$50.98	\$12.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$52.08	\$12.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$53.23	\$12.50	\$15.70	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$32.47	\$12.50	\$15.70	\$0.00	\$60.67
	06/01/2020	\$33.22	\$12.50	\$15.70	\$0.00	\$61.42
	12/01/2020	\$34.00	\$12.50	\$15.70	\$0.00	\$62.20
	06/01/2021	\$34.75	\$12.50	\$15.70	\$0.00	\$62.95
	12/01/2021	\$35.54	\$12.50	\$15.70	\$0.00	\$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS 42 - J.G. MacLeallan (Wakefield)</i>	05/01/2019	\$26.30	\$7.99	\$7.00	\$0.00	\$41.29
	05/01/2020	\$26.65	\$7.99	\$7.00	\$0.00	\$41.64
	05/01/2021	\$27.00	\$7.99	\$7.00	\$0.00	\$41.99
RECLAIMERS <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ROOFER (Inc.Roofing Waterproofing &Roofing Damproofg) ROOFERS LOCAL 33	02/01/2020	\$45.92	\$11.50	\$15.90	\$0.00	\$73.32
	08/01/2020	\$47.35	\$11.50	\$15.90	\$0.00	\$74.75
	02/01/2021	\$48.78	\$11.50	\$15.90	\$0.00	\$76.18
	08/01/2021	\$50.21	\$11.50	\$15.90	\$0.00	\$77.61
	02/01/2022	\$51.64	\$11.50	\$15.90	\$0.00	\$79.04

Apprentice - ROOFER - Local 33

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.96	\$11.50	\$3.69	\$0.00	\$38.15
2	60	\$27.55	\$11.50	\$15.90	\$0.00	\$54.95
3	65	\$29.85	\$11.50	\$15.90	\$0.00	\$57.25
4	75	\$34.44	\$11.50	\$15.90	\$0.00	\$61.84
5	85	\$39.03	\$11.50	\$15.90	\$0.00	\$66.43

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.68	\$11.50	\$3.69	\$0.00	\$38.87
2	60	\$28.41	\$11.50	\$15.90	\$0.00	\$55.81
3	65	\$30.78	\$11.50	\$15.90	\$0.00	\$58.18
4	75	\$35.51	\$11.50	\$15.90	\$0.00	\$62.91
5	85	\$40.25	\$11.50	\$15.90	\$0.00	\$67.65

Notes: ** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1
 Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs.
 (Hot Pitch Mechanics' receive \$1.00 hr. above ROOFER)

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE ROOFERS LOCAL 33	02/01/2020	\$46.17	\$11.50	\$15.90	\$0.00	\$73.57
	08/01/2020	\$47.60	\$11.50	\$15.90	\$0.00	\$75.00
	02/01/2021	\$49.03	\$11.50	\$15.90	\$0.00	\$76.43
	08/01/2021	\$50.46	\$11.50	\$15.90	\$0.00	\$77.86
	02/01/2022	\$51.89	\$11.50	\$15.90	\$0.00	\$79.29

For apprentice rates see "Apprentice- ROOFER"

SHEETMETAL WORKER SHEETMETAL WORKERS LOCAL 17 - A	02/01/2020	\$49.36	\$13.35	\$24.12	\$2.61	\$89.44
	08/01/2020	\$50.96	\$13.35	\$24.12	\$2.66	\$91.09
	02/01/2021	\$52.61	\$13.35	\$24.12	\$2.71	\$92.79
	08/01/2021	\$54.36	\$13.35	\$24.12	\$2.76	\$94.59
	02/01/2022	\$56.11	\$13.35	\$24.12	\$2.81	\$96.39

Apprentice - SHEET METAL WORKER - Local 17-A

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	\$20.73	\$13.35	\$5.89	\$0.00	\$39.97
2	42	\$20.73	\$13.35	\$5.89	\$0.00	\$39.97
3	47	\$23.20	\$13.35	\$11.13	\$1.43	\$49.11
4	47	\$23.20	\$13.35	\$11.13	\$1.43	\$49.11
5	52	\$25.67	\$13.35	\$12.08	\$1.53	\$52.63
6	52	\$25.67	\$13.35	\$12.33	\$1.54	\$52.89
7	60	\$29.62	\$13.35	\$13.70	\$1.70	\$58.37
8	65	\$32.08	\$13.35	\$15.15	\$1.80	\$62.38
9	75	\$37.02	\$13.35	\$16.56	\$2.01	\$68.94
10	85	\$41.96	\$13.35	\$17.96	\$2.20	\$75.47

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	\$21.40	\$13.35	\$5.89	\$0.00	\$40.64
2	42	\$21.40	\$13.35	\$5.89	\$0.00	\$40.64
3	47	\$23.95	\$13.35	\$11.13	\$1.45	\$49.88
4	47	\$23.95	\$13.35	\$11.13	\$1.45	\$49.88
5	52	\$26.50	\$13.35	\$12.08	\$1.56	\$53.49
6	52	\$26.50	\$13.35	\$12.33	\$1.57	\$53.75
7	60	\$30.58	\$13.35	\$13.70	\$1.73	\$59.36
8	65	\$33.12	\$13.35	\$15.15	\$1.85	\$63.47
9	75	\$38.22	\$13.35	\$16.56	\$2.04	\$70.17
10	85	\$43.32	\$13.35	\$17.96	\$2.24	\$76.87

Notes:
Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP < 35 TONS	12/01/2019	\$35.64	\$12.41	\$13.72	\$0.00	\$61.77
TEAMSTERS JOINT COUNCIL NO. 10 ZONE A	06/01/2020	\$36.54	\$12.41	\$13.72	\$0.00	\$62.67
	08/01/2020	\$36.54	\$12.91	\$13.72	\$0.00	\$63.17
	12/01/2020	\$36.54	\$12.91	\$14.82	\$0.00	\$64.27
	06/01/2021	\$37.34	\$12.91	\$14.82	\$0.00	\$65.07
	08/01/2021	\$37.34	\$13.41	\$14.82	\$0.00	\$65.57
	12/01/2021	\$37.34	\$13.41	\$16.01	\$0.00	\$66.76

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2019	\$35.93	\$12.41	\$13.72	\$0.00	\$62.06
	06/01/2020	\$36.83	\$12.41	\$13.72	\$0.00	\$62.96
	08/01/2020	\$36.83	\$12.91	\$13.72	\$0.00	\$63.46
	12/01/2020	\$36.83	\$12.91	\$14.82	\$0.00	\$64.56
	06/01/2021	\$37.63	\$12.91	\$14.82	\$0.00	\$65.36
	08/01/2021	\$37.63	\$13.41	\$14.82	\$0.00	\$65.86
	12/01/2021	\$37.63	\$13.41	\$16.01	\$0.00	\$67.05

SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1</i>	01/01/2020	\$60.07	\$9.68	\$19.80	\$0.00	\$89.55
	03/01/2020	\$61.98	\$9.47	\$19.60	\$0.00	\$91.05
	10/01/2020	\$63.48	\$9.47	\$19.60	\$0.00	\$92.55
	03/01/2021	\$64.98	\$9.47	\$19.60	\$0.00	\$94.05

Apprentice - SPRINKLER FITTER - Local 550 (Section A) Zone 1

Effective Date - 01/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$21.02	\$9.68	\$11.35	\$0.00	\$42.05
2	40	\$24.03	\$9.68	\$12.00	\$0.00	\$45.71
3	45	\$27.03	\$9.68	\$12.65	\$0.00	\$49.36
4	50	\$30.04	\$9.68	\$13.30	\$0.00	\$53.02
5	55	\$33.04	\$9.68	\$13.95	\$0.00	\$56.67
6	60	\$36.04	\$9.68	\$14.60	\$0.00	\$60.32
7	65	\$39.05	\$9.68	\$15.25	\$0.00	\$63.98
8	70	\$42.05	\$9.68	\$15.90	\$0.00	\$67.63
9	75	\$45.05	\$9.68	\$16.55	\$0.00	\$71.28
10	80	\$48.06	\$9.68	\$17.20	\$0.00	\$74.94

Notes: Apprentice entered prior 9/30/10:
40/45/50/55/60/65/70/75/80/85
Steps are 850 hours

Apprentice to Journeyworker Ratio:1:3

STEAM BOILER OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TELECOMMUNICATION TECHNICIAN <i>ELECTRICIANS LOCAL 103</i>	09/01/2019	\$39.76	\$13.00	\$16.86	\$0.00	\$69.62
	03/01/2020	\$40.13	\$13.00	\$17.12	\$0.00	\$70.25
	09/01/2020	\$41.20	\$13.00	\$17.16	\$0.00	\$71.36
	03/01/2021	\$42.66	\$13.00	\$17.27	\$0.00	\$72.93
	09/01/2021	\$44.32	\$13.00	\$17.38	\$0.00	\$74.70
	03/01/2022	\$45.83	\$13.00	\$17.49	\$0.00	\$76.32
	09/01/2022	\$47.55	\$13.00	\$17.62	\$0.00	\$78.17
	03/01/2023	\$49.11	\$13.00	\$17.73	\$0.00	\$79.84

Apprentice - TELECOMMUNICATION TECHNICIAN - Local 103

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$17.89	\$13.00	\$0.54	\$0.00	\$31.43
2	45	\$17.89	\$13.00	\$0.54	\$0.00	\$31.43
3	50	\$19.88	\$13.00	\$13.75	\$0.00	\$46.63
4	50	\$19.88	\$13.00	\$13.75	\$0.00	\$46.63
5	55	\$21.87	\$13.00	\$14.06	\$0.00	\$48.93
6	60	\$23.86	\$13.00	\$14.37	\$0.00	\$51.23
7	65	\$25.84	\$13.00	\$14.69	\$0.00	\$53.53
8	70	\$27.83	\$13.00	\$14.99	\$0.00	\$55.82
9	75	\$29.82	\$13.00	\$15.30	\$0.00	\$58.12
10	80	\$31.81	\$13.00	\$15.61	\$0.00	\$60.42

Effective Date - 03/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$18.06	\$13.00	\$0.54	\$0.00	\$31.60
2	45	\$18.06	\$13.00	\$0.54	\$0.00	\$31.60
3	50	\$20.07	\$13.00	\$14.00	\$0.00	\$47.07
4	50	\$20.07	\$13.00	\$14.00	\$0.00	\$47.07
5	55	\$22.07	\$13.00	\$14.31	\$0.00	\$49.38
6	60	\$24.08	\$13.00	\$14.62	\$0.00	\$51.70
7	65	\$26.08	\$13.00	\$14.94	\$0.00	\$54.02
8	70	\$28.09	\$13.00	\$15.26	\$0.00	\$56.35
9	75	\$30.10	\$13.00	\$15.56	\$0.00	\$58.66
10	80	\$32.10	\$13.00	\$15.87	\$0.00	\$60.97

Notes:

Apprentice to Journeyworker Ratio:1:1

TERRAZZO FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2020	\$53.34	\$10.75	\$21.94	\$0.00	\$86.03
	08/01/2020	\$54.69	\$10.75	\$22.09	\$0.00	\$87.53
	02/01/2021	\$55.33	\$10.75	\$22.09	\$0.00	\$88.17
	08/01/2021	\$56.73	\$10.75	\$22.25	\$0.00	\$89.73
	02/01/2022	\$57.32	\$10.75	\$22.25	\$0.00	\$90.32

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - TERRAZZO FINISHER - Local 3 Marble & Tile

Effective Date - 02/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.67	\$10.75	\$21.94	\$0.00	\$59.36
2	60	\$32.00	\$10.75	\$21.94	\$0.00	\$64.69
3	70	\$37.34	\$10.75	\$21.94	\$0.00	\$70.03
4	80	\$42.67	\$10.75	\$21.94	\$0.00	\$75.36
5	90	\$48.01	\$10.75	\$21.94	\$0.00	\$80.70

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.35	\$10.75	\$22.09	\$0.00	\$60.19
2	60	\$32.81	\$10.75	\$22.09	\$0.00	\$65.65
3	70	\$38.28	\$10.75	\$22.09	\$0.00	\$71.12
4	80	\$43.75	\$10.75	\$22.09	\$0.00	\$76.59
5	90	\$49.22	\$10.75	\$22.09	\$0.00	\$82.06

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER	12/01/2019	\$40.50	\$8.10	\$16.80	\$0.00	\$65.40
<i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2020	\$41.49	\$8.10	\$16.80	\$0.00	\$66.39
	12/01/2020	\$42.47	\$8.10	\$16.80	\$0.00	\$67.37
	06/01/2021	\$43.49	\$8.10	\$16.80	\$0.00	\$68.39
	12/01/2021	\$44.50	\$8.10	\$16.80	\$0.00	\$69.40

For apprentice rates see "Apprentice- LABORER"

TEST BORING DRILLER HELPER	12/01/2019	\$39.22	\$8.10	\$16.80	\$0.00	\$64.12
<i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2020	\$40.21	\$8.10	\$16.80	\$0.00	\$65.11
	12/01/2020	\$41.19	\$8.10	\$16.80	\$0.00	\$66.09
	06/01/2021	\$42.21	\$8.10	\$16.80	\$0.00	\$67.11
	12/01/2021	\$43.22	\$8.10	\$16.80	\$0.00	\$68.12

For apprentice rates see "Apprentice- LABORER"

TEST BORING LABORER	12/01/2019	\$39.10	\$8.10	\$16.80	\$0.00	\$64.00
<i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2020	\$40.09	\$8.10	\$16.80	\$0.00	\$64.99
	12/01/2020	\$41.07	\$8.10	\$16.80	\$0.00	\$65.97
	06/01/2021	\$42.09	\$8.10	\$16.80	\$0.00	\$66.99
	12/01/2021	\$43.10	\$8.10	\$16.80	\$0.00	\$68.00

For apprentice rates see "Apprentice- LABORER"

TRACTORS/PORTABLE STEAM GENERATORS	12/01/2019	\$48.23	\$12.50	\$15.70	\$0.00	\$76.43
<i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2020	\$49.31	\$12.50	\$15.70	\$0.00	\$77.51
	12/01/2020	\$50.45	\$12.50	\$15.70	\$0.00	\$78.65
	06/01/2021	\$51.54	\$12.50	\$15.70	\$0.00	\$79.74
	12/01/2021	\$52.68	\$12.50	\$15.70	\$0.00	\$80.88

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2019	\$36.22	\$12.41	\$13.72	\$0.00	\$62.35
	06/01/2020	\$37.12	\$12.41	\$13.72	\$0.00	\$63.25
	08/01/2020	\$37.12	\$12.91	\$13.72	\$0.00	\$63.75
	12/01/2020	\$37.12	\$12.91	\$14.82	\$0.00	\$64.85
	06/01/2021	\$37.92	\$12.91	\$14.82	\$0.00	\$65.65
	08/01/2021	\$37.92	\$13.41	\$14.82	\$0.00	\$66.15
	12/01/2021	\$37.92	\$13.41	\$16.01	\$0.00	\$67.34
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	12/01/2019	\$51.38	\$8.10	\$17.20	\$0.00	\$76.68
	06/01/2020	\$52.37	\$8.10	\$17.20	\$0.00	\$77.67
	12/01/2020	\$53.35	\$8.10	\$17.20	\$0.00	\$78.65
	06/01/2021	\$54.37	\$8.10	\$17.20	\$0.00	\$79.67
	12/01/2021	\$55.38	\$8.10	\$17.20	\$0.00	\$80.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	12/01/2019	\$53.38	\$8.10	\$17.20	\$0.00	\$78.68
	06/01/2020	\$54.37	\$8.10	\$17.20	\$0.00	\$79.67
	12/01/2020	\$55.35	\$8.10	\$17.20	\$0.00	\$80.65
	06/01/2021	\$56.37	\$8.10	\$17.20	\$0.00	\$81.67
	12/01/2021	\$57.38	\$8.10	\$17.20	\$0.00	\$82.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2019	\$43.45	\$8.10	\$17.20	\$0.00	\$68.75
	06/01/2020	\$44.44	\$8.10	\$17.20	\$0.00	\$69.74
	12/01/2020	\$45.42	\$8.10	\$17.20	\$0.00	\$70.72
	06/01/2021	\$46.44	\$8.10	\$17.20	\$0.00	\$71.74
	12/01/2021	\$47.45	\$8.10	\$17.20	\$0.00	\$72.75
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	12/01/2019	\$45.45	\$8.10	\$17.20	\$0.00	\$70.75
	06/01/2020	\$46.44	\$8.10	\$17.20	\$0.00	\$71.74
	12/01/2020	\$47.42	\$8.10	\$17.20	\$0.00	\$72.72
	06/01/2021	\$48.44	\$8.10	\$17.20	\$0.00	\$73.74
	12/01/2021	\$49.45	\$8.10	\$17.20	\$0.00	\$74.75
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE A</i>	12/01/2019	\$35.64	\$12.41	\$13.72	\$0.00	\$61.77
	06/01/2020	\$36.54	\$12.41	\$13.72	\$0.00	\$62.67
	08/01/2020	\$36.54	\$12.91	\$13.72	\$0.00	\$63.17
	12/01/2020	\$36.54	\$12.91	\$14.82	\$0.00	\$64.27
	06/01/2021	\$37.34	\$12.91	\$14.82	\$0.00	\$65.07
	08/01/2021	\$37.34	\$13.41	\$14.82	\$0.00	\$65.57
	12/01/2021	\$37.34	\$13.41	\$16.01	\$0.00	\$66.76
WAGON DRILL OPERATOR <i>LABORERS - ZONE 1</i>	12/01/2019	\$39.40	\$8.10	\$16.60	\$0.00	\$64.10
	06/01/2020	\$40.39	\$8.10	\$16.60	\$0.00	\$65.09
	12/01/2020	\$41.37	\$8.10	\$16.60	\$0.00	\$66.07
	06/01/2021	\$42.39	\$8.10	\$16.60	\$0.00	\$67.09
	12/01/2021	\$43.40	\$8.10	\$16.60	\$0.00	\$68.10
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
WASTE WATER PUMP OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2019	\$48.73	\$12.50	\$15.70	\$0.00	\$76.93
	06/01/2020	\$49.83	\$12.50	\$15.70	\$0.00	\$78.03
	12/01/2020	\$50.98	\$12.50	\$15.70	\$0.00	\$79.18
	06/01/2021	\$52.08	\$12.50	\$15.70	\$0.00	\$80.28
	12/01/2021	\$53.23	\$12.50	\$15.70	\$0.00	\$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER <i>PLUMBERS & GASFITTERS LOCAL 12</i>	09/01/2019	\$57.69	\$11.82	\$17.01	\$0.00	\$86.52
	03/01/2020	\$58.69	\$12.07	\$17.26	\$0.00	\$88.02
	09/01/2020	\$60.19	\$12.07	\$17.26	\$0.00	\$89.52
	03/01/2021	\$61.69	\$12.07	\$17.26	\$0.00	\$91.02
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$28.83	\$8.75	\$1.86	\$0.00	\$39.44
	08/30/2020	\$29.67	\$9.25	\$1.89	\$0.00	\$40.81
For apprentice rates see "Apprentice- LINEMAN"						
CABLEMAN (Underground Ducts & Cables) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$40.84	\$8.75	\$10.02	\$0.00	\$59.61
	08/30/2020	\$42.03	\$9.25	\$10.27	\$0.00	\$61.55
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN CDL <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$33.64	\$8.75	\$9.86	\$0.00	\$52.25
	08/30/2020	\$34.62	\$9.25	\$10.07	\$0.00	\$53.94
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$26.43	\$8.75	\$1.79	\$0.00	\$36.97
	08/30/2020	\$27.20	\$9.25	\$1.82	\$0.00	\$38.27
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class A CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$40.84	\$8.75	\$14.10	\$0.00	\$63.69
	08/30/2020	\$42.03	\$9.25	\$14.35	\$0.00	\$65.63
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class B CDL) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$36.04	\$8.75	\$10.65	\$0.00	\$55.44
	08/30/2020	\$37.09	\$9.25	\$10.87	\$0.00	\$57.21
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$21.62	\$8.75	\$1.65	\$0.00	\$32.02
	08/30/2020	\$22.25	\$9.25	\$1.67	\$0.00	\$33.17
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN -Inexperienced (<2000 Hrs.) <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$26.43	\$8.75	\$1.79	\$0.00	\$36.97
	08/30/2020	\$27.20	\$9.25	\$1.82	\$0.00	\$38.27
For apprentice rates see "Apprentice- LINEMAN"						
JOURNEYMAN LINEMAN <i>OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104</i>	09/01/2019	\$48.05	\$8.75	\$17.19	\$0.00	\$73.99
	08/30/2020	\$49.45	\$9.25	\$17.48	\$0.00	\$76.18

Classification

Effective Date Base Wage Health Pension Supplemental Unemployment Total Rate

Apprentice - LINEMAN (Outside Electrical) - East Local 104

Effective Date - 09/01/2019

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$28.83	\$8.75	\$3.36	\$0.00	\$40.94
2	65	\$31.23	\$8.75	\$3.44	\$0.00	\$43.42
3	70	\$33.64	\$8.75	\$3.51	\$0.00	\$45.90
4	75	\$36.04	\$8.75	\$5.08	\$0.00	\$49.87
5	80	\$38.44	\$8.75	\$5.15	\$0.00	\$52.34
6	85	\$40.84	\$8.75	\$5.23	\$0.00	\$54.82
7	90	\$43.25	\$8.75	\$7.30	\$0.00	\$59.30

Effective Date - 08/30/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$29.67	\$9.25	\$3.39	\$0.00	\$42.31
2	65	\$32.14	\$9.25	\$3.46	\$0.00	\$44.85
3	70	\$34.62	\$9.25	\$3.54	\$0.00	\$47.41
4	75	\$37.09	\$9.25	\$5.11	\$0.00	\$51.45
5	80	\$39.56	\$9.25	\$5.19	\$0.00	\$54.00
6	85	\$42.03	\$9.25	\$5.26	\$0.00	\$56.54
7	90	\$44.51	\$9.25	\$7.34	\$0.00	\$61.10

Notes:

Apprentice to Journeyworker Ratio:1:2

TELEDATA CABLE SPLICER
OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 02/04/2019 \$30.73 \$4.70 \$3.17 \$0.00 \$38.60

TELEDATA LINEMAN/EQUIPMENT OPERATOR
OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 02/04/2019 \$28.93 \$4.70 \$3.14 \$0.00 \$36.77

TELEDATA WIREMAN/INSTALLER/TECHNICIAN
OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 02/04/2019 \$28.93 \$4.70 \$3.14 \$0.00 \$36.77

TREE TRIMMER
OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 01/31/2016 \$18.51 \$3.55 \$0.00 \$0.00 \$22.06

This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is not on the ground. This classification does not apply to wholesale tree removal.

TREE TRIMMER GROUNDMAN
OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104 01/31/2016 \$16.32 \$3.55 \$0.00 \$0.00 \$19.87

This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is on the ground. This classification does not apply to wholesale tree removal.

Additional Apprentices Information:

Minimum wage rates for apprentices employed on public works projects are listed above as a percentage of the pre-determined hourly wage rate established by the Commissioner under the provisions of the M.G.L. c. 149, ss. 26-27D. Apprentices ratios are established by the Division of Apprenticeship Training pursuant to M.G.L. c. 23, ss. 11E-11L.

All apprentices must be registered with the Division of Apprenticeship Training in accordance with M.G.L. c. 23, ss. 11E-11L.

All steps are six months (1000 hours.)

Ratios are expressed in allowable number of apprentices to journeymen or fraction thereof, unless otherwise specified.

** Multiple ratios are listed in the comment field.

*** APP to JM; 1:1, 2:2, 2:3, 3:4, 4:4, 4:5, 4:6, 5:7, 6:7, 6:8, 6:9, 7:10, 8:10, 8:11, 8:12, 9:13, 10:13, 10:14, etc.

**** APP to JM; 1:1, 1:2, 2:3, 2:4, 3:5, 4:6, 4:7, 5:8, 6:9, 6:10, 7:11, 8:12, 8:13, 9:14, 10:15, 10:16, etc.

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 LOCATION OF WORK

A. The work under this Contract is located in the City of Woburn, Massachusetts and it includes the following streets:

1. Clean and line water mains on Houghton St.; Davis St/; and James St.
2. Install a new water 8 inch main on Mountain Ave.
3. Install new 12 inch main on Montvale Ave.

1.02 SEQUENCE OF WORK

- A. The existing water mains to be cleaned and lined will be phased in contiguous sections. . A project schedule shall be submitted to the Water Department for approval.
- B. The contractor shall prepare and submit a temporary service plan for review by the water department and the fire department prior to initiating work.
- C. The contractor shall coordinate with the Water Department for all water main shut downs and changes in the system.
- D. All construction signage shall be furnished by the contractor and coordinated with the Police Department prior to initiating work.

1.03 SCOPE OF WORK

- A. Furnish all labor, tools, material, equipment and incidentals required to: install temporary water service to all customers affected by the work; install new water main, clean the existing water main; install new cement lining in the pipe; replace all valves and hydrants; disinfect, test and place the line back in service, and place temporary and permanent pavement, all as specified herein.

1.04 SERVICES PROVIDED BY THE CITY

- A. The Woburn Water Department will perform all bacteria testing required for the temporary water service lines and the new water main. The Contractor shall coordinate all testing efforts with the Water Department

1.05 CONTRACTOR'S USE OF PERMISES

- A. The contractor shall obtain and pay for use of all storage or work areas required to perform the Work. The Contractor shall be responsible for the disposal of all surplus materials from the work.
- B. Toilet facilities are not available at the site. Contractor shall provide portable toilet facilities at the site for use of Contractor's employees.
- C. Evidence that Contractor and his employees are not following appropriate sanitary procedures shall be cause for owner to shut down the work until the condition is corrected to Owner's satisfaction.

1.06 POLICE DETAILS

- A. The City of Woburn is responsible for the payment of police details used for this contract.
- B. The Contractor is responsible for the scheduling of details with the Department of Public Works.

1.07 MUNICIPAL FEES

- A. All municipal fees are waived for work associated with the subject project, however permits are still required.

**Section 01025
MEASUREMENT AND PAYMENT**

PART 1 GENERAL

1.01 A CLEANING AND LINING WATER MAINS (Item 1a)

A. Measurement

1. The pipe actually cleaned by the Dragline Method or by Hand Cleaning, lined with cement mortar in accordance with the specifications, and accepted by the Owner, will be measured for payment. The work will be measured along the center line of pipe without deduction for valves and fittings in the line.
2. Excavation, disposal of excavated materials and backfilling of test pits and trenches for pipe openings and all other work specified under Section 02221 will be considered incidental to the cleaning and lining of the water main and no separate measurement will be made theretofore.

B. Payment

1. Payment for cleaning by the Dragline Method (or by Hand Cleaning, where Hand Cleaning is required by the Specifications) and cement lining the water mains in place will be made at the unit bid price per linear foot of pipe in the Bid Form under Item 1a. Price and payment shall be full compensation for furnishing all labor; materials; site preparation, including construction signage; equipment and materials; removing and disposing of existing; furnishing and installing new pipes, valves, couplings and appurtenances as required to perform the work; creating and restoring pipe openings required for cleaning and lining; installing corporation stops at the pipe openings required for cleaning and lining; dewatering; work through obstructions; cleaning; inspection; cement lining including curing; and chlorination of the pipe; testing of the cement mortar lining; thrust restraint, where required; removing the existing main line valves and appurtenances and installing new valves and appurtenances; making hydrostatic pressures tests of the main after the main line valves are installed and pipe closure pieces are in place; all excavating and backfilling work including cutting and removing existing pavement systems including sub base, sheeting, bracing, and steel decking; installation of pavement sub base consisting of Controlled density fill and pavement; installation, maintenance and removal of temporary services, piping and hydrants; miscellaneous work and clean up; and all related work specified and all else in connection therewith and incidental thereto for which separate payment is not provided under other items.

2. Payment for rock and boulder excavation will be made under Items 4a and 4b.
3. Payment for concrete thrust blocks and controlled density fill will be made under Item 3.

C. Pavement Placement

1. Payment for Items 1a thru 1g in the Bid Form shall include payment for temporary trench width pavement of 4 inches of Type I-1 bituminous concrete binder in City Streets, complete in place and approved by the Engineer. This price and payment shall be full compensation for saw cutting and removing existing pavement outside the trench on each side. This price and payment shall be full compensation for cleaning and priming the edges of the existing pavement, cleaning and preparing the surface of the controlled density fill, furnishing, placing and maintaining bituminous concrete, including labor, materials, and all else incidental thereto for which payment is not provided under other items.
2. Payment includes restoring pavement markings, clean up, and all else incidental thereto. Payment shall include adjustments to all castings to the final pavement level.
3. Payment under shall include all costs of furnishing, storing and applying calcium chloride as required for dust control.
4. Payment under shall include all costs for restoring sidewalks, driveways and curbing, of whatever type encountered, to at least original condition.
5. If the thickness of pavement ordered placed by the Owner is greater than that specified, payment will be prorated on the basis of the thickness of material actually ordered placed. No payment will be made for any additional pavement not specifically ordered in writing by the Owner.
6. No additional payment will be made for leveling course.
7. Payment for furnishing and installing controlled density fill for backfill shall be paid for under item 3, Miscellaneous Concrete and shall include furnishing and removing street plates as required.

D. Temporary Service Pipe, Temporary Services and Hydrants

1. Payment for Item 1a thru 1d shall include full compensation for all labor, equipment, materials and incidentals necessary to install and remove temporary water service to all one, two, three family residences, commercial establishments and fire protection by the methods described in Section 02656. Payment shall be full compensation for cutting existing pavement, trench excavation (excluding rock and boulder), furnishing, installing, and removing all piping materials, corporation

stops, fittings, hoses, sidewalk cutting and replacement, and all work required for or incidental to the satisfactory completion of this Item.

2. Temporary hydrants shall replace all hydrants deactivated during the cleaning and lining work and shall be supplied by minimum 4-inch diameter temporary services lines.

E. Miscellaneous Work and Cleanup

1. Payment for miscellaneous work and cleanup is included in the unit bid costs for Items 1a in the Bid Form. This price shall be full compensation for all labor, materials, equipment and incidentals required to do all the work specified in Section 02901 and video taping and the pictures of the work site as specified in Section 01300, and includes work not specifically included under other items but which are obviously necessary for the proper completion of the Contract. Work to cut and plug abandoned mains and to remove existing abandoned gate boxes and covers shall be included under this item.

1.01 B WATER MAIN INSTALLATION (Items 1b through 1c)

A. Measurement

1. The cement lined ductile iron pipe installing in accordance with the specifications, and accepted by the Owner, will be measured for payment. The work will be measured along the center line of pipe without deduction for valves and fittings in the line.

B. Payment

1. Payment for cement lined ductile iron pipe will be made at the unit bid price per linear foot of pipe in the Bid Form under Items 1b thru 1c. Price and payment shall be full compensation for furnishing all labor; site preparation; equipment; materials for measurement; removing and disposing of existing and installing new pipes, valves, couplings and appurtenances as required to perform the work; creating and restoring pipe openings required for water main installation; dewatering; cleaning; inspection; and chlorination of the pipe; thrust restraint, where required; removing the existing main and appurtenances and installing new valves and appurtenances; making hydrostatic pressures tests of the main installed and pipe closure pieces are in place; all excavating and backfilling work including cutting and removing existing pavement systems including sub base, sheeting, bracing, and steel decking; installation of pavement sub base (bank run gravel) and temporary and final pavement (Binder and Top Courses); installation, maintenance and removal of temporary services, piping and hydrants; miscellaneous work and clean up; and all related work specified and all else in connection therewith and incidental thereto for which separate payment is not provided under other items.

C. Pavement Replacement

1. Payment for Items 1b thru 1c in the Bid Form shall include payment for permanent and temporary trench width pavement as specified. This price and payment shall be full compensation for saw cutting and removing existing pavement outside the trench on each side and removal of temporary pavement. This price and payment shall be full compensation for cleaning and priming the edges of the existing pavement, cleaning and preparing the surface of the gravel base, furnishing, placing and maintaining bituminous concrete, including labor, materials, and all else incidental thereto for which payment is not provided under other items. Payment shall include adjustments to all castings to the final pavement level.
2. Payment under shall include all costs of furnishing, storing and applying calcium chloride as required for dust control.
3. Payment under shall include all costs for restoring sidewalks, driveways and curbing, of whatever type encountered, to at least original condition.
4. If the thickness of pavement ordered placed by the Owner is greater than that specified, payment will be prorated on the basis of the thickness of material actually ordered placed. No payment will be made for any additional pavement not specifically ordered in writing by the Owner.
5. No additional payment will be made for leveling course.

D. Temporary Service Pipe, Temporary Services and Hydrants

1. Payment for Item 1 thru 1c shall include full compensation for all labor, equipment, materials and incidentals necessary to install and remove temporary water service to all one, two, three family residences, commercial establishments and fire protection by the methods described in Section 02656. Payment shall be full compensation for cutting existing pavement, trench excavation (excluding rock and boulder), furnishing, installing, and removing all piping materials, corporation stops, fittings, hoses, sidewalk cutting and replacement, and all work required for or incidental to the satisfactory completion of this Item.
2. Temporary hydrants shall replace all hydrants deactivated during the water main installation work and shall be supplied by minimum 4-inch diameter temporary services lines.

E. Miscellaneous Work and Cleanup

1. Payment for miscellaneous work and cleanup is included in the unit bid costs for Items 1a through 1d in the Bid Form. This price shall be full compensation for all labor, materials, equipment and incidentals required to do all the work specified in Section 02901 and video taping and the pictures of the work site as specified in Section 01300, and includes work not specifically included under other items but which are obviously necessary for the proper completion of the Contract. Work to cut and plug abandoned mains and to remove existing abandoned gate boxes and covers shall be included under this item.

1.01 C ADDITIONAL COST TO INSTALL SIDELINE VALVES (Item 1e)

A. Measurement

1. The additional cost to furnish and install sideline gate valves and appurtenances at intersecting streets to the water mains along will be measured as the actual number of 6", 8", 10", and 12" gate assemblies installed and accepted by the engineer. This item includes connection of fire services 4 inches and larger that may be encountered. The locations of intersecting streets include: Davis St. at Main St.; James St.; Houlton St. at Harrison Ave.; Houlton St. at Bedford Rd.; Mountain Ave. At Main St.; Mountain Ave. at Pearl St.; Montvale Ave. at Washington St. and Montvale brige.

B. Payment

1. Price and payment shall be full compensation for furnishing all labor; materials; site preparation, including construction signage; equipment and materials; removing and disposing of existing; furnishing and installing new pipes, valves, couplings and appurtenances as required to perform the work; including thrust restraint, removing the existing valves and appurtenances and installing new valves and appurtenances; all excavating and backfilling work including cutting and removing existing pavement systems including sub base, sheeting, bracing, and steel decking; installation of pavement sub base consisting of backfill and temporary pavement; installation, maintenance and removal of temporary services, piping and hydrants; miscellaneous work and clean up; and all related work specified and all else in connection therewith and incidental thereto for which separate payment is not provided under other items.

1.02 SERVICE CONNECTIONS AND ANCILLARY WORK (Items 2a thru 2c)

A. Measurement

1. Corporation stops (Item 2a) will be measured as the actual number of corporation stops installed in the completed project and accepted by the Engineer.
2. Curb stops (Item 2b) will be measured as the actual number of curb stops with boxes installed in the completed project and accepted by the Engineer.
3. Copper tubing (Item 2c) for water service connections installed in streets and sidewalk areas will be measured as the actual number of linear feet of tubing installed in the completed project as measured from the centerline of the water main to the end of the new service line installed.

B. Payment

1. Payment for furnishing and installing 1-inch corporation stops will be made for the respective quantity as determined above the applicable unit price bid under Items 2a of the Bid Form. Price and payment shall be full compensation for all work of installing the 1-inch corporation stops and appurtenances, excavation (excluding rock and boulder excavation, backfilling as specified, and all else incidental thereto for which payment is not provided under other items in the Bid Form.
2. Payment for furnishing and installing 1-inch curb stops will be made for at the respective quantity as determined above at the applicable unit price bid under Items 2b of the Bid Form. Price and payment shall be full compensation for all work of installing the 1-inch curb stops with boxes, all excavation (excluding rock and boulder excavation), backfilling, setting boxes and all else incidental thereto for which payment is not provided under other items in the Bid Form.
3. Payment for furnishing and installing 1-inch copper tubing service connections will be made for the respective quantity as determined above at the applicable unit price under Items 2c of the Bid Form. Price and payment shall be full compensation for all work of installing the 1-inch copper tubing and all required adapters, reducers, fittings, and appurtenances required for executing such connections, chlorinating, trench excavation (excluding rock and boulder excavation), installation and removal of formwork, backfilling including cost of material, restoring the trench surface to grade, disposal of excavated materials, and all work required for or incidental to the satisfactory completion of the Items for which payment is not provided under other items in the Bid Form.
4. Payment under Item 2a, 2b and 2c shall include the installation of temporary trench width pavement.
5. Payment for rock and boulder excavation will be made under Items 5a and 5b.

1.03 MISCELLANEOUS CONCRETE (Item 3)

A. Measurement

1. Concrete (Item 3) shall be measured in place in the completed work by average dimensions in each of three planes. Slip measurement shall not be allowed.

B. Payment

1. Payment for concrete thrust blocks and concrete used for miscellaneous purposes shall be made for the quantity measured in place (cubic yards) at the unit price bid in the Bid Form for Item 3 and shall be full compensation for all work required for, or incidental to the satisfactory completion of the Item for which separate payment is not provided under other items in the Bid Form.

1.04 ROCK AND BOULDER EXCAVATION (Items 4a and 4b)

A. Measurement

1. When rock is encountered, the material shall be uncovered and the Engineer notified. The Engineer will take cross sections of the rock surface. If the Contractor fails to uncover the rock and notify the Engineer to allow ample time for cross-sectioning the undisturbed material, the Contractor shall have no right-of-claim to any classification other than that allowed by the Engineer.
2. Boulders of more than 1 cu yd in volume when encountered in earth or trench excavation will be measured for payment.
3. The quantity of rock and boulder excavation to be paid for will be the number of cubic yards of rock or boulders measured in place, as directed by the Engineer, within the limits specified.
4. The maximum width measured for payment shall be 3.0 feet for all pipes at all depths except service connections where the maximum width shall be 1 feet. The width measured for payment shall be centered horizontally along the center of the pipe.

B. Payment

1. Payment for rock and boulder excavation will be made for the quantities as above determined, measured in cubic yards, at the unit price bid in the Bid Form, which price and payment will be full compensation for excavation, blasting and disposal of rock, backfilling and providing screened gravel, for any deficiency of trench backfill, and all work incidental thereto, for which payment is not provided under

other items. No payment will be made under Items 5a and 5b for refill material to replace any deficiency of backfill material.

1.05 GRAVEL AND COMMON FILL (Items 5a and 5b)

A. Measurement

1. Screened gravel (Item 5a), when used in conjunction with utility crossings and other locations when its use is ordered by the Engineer, will be measured in cubic yards at actual in-place dimensions as determined by the Engineer. The width measured for payment shall not exceed 4.0 feet for pipelines and 3.0 feet for service connections.
2. Common fill (Item 5b) when its use is ordered by the Engineer to replace unsuitable backfill materials, will be measured in cubic yards at actual in-place dimensions as determined by the Engineer. When used, as directed by the Engineer, in trenches, the width measured for payment shall not exceed 4.0 feet for pipelines and 3.0 feet for service connections.

B. Payment

1. Payment or furnishing and placing screened gravel and common fill will be made for the quantity determined above at the respective unit prices bid for Items 4a and 4b, respectively. Price and payment shall be full compensation for furnishing, hauling, placing, and compacting the particular granular fill material, and all else incidental thereto for which separate payment is not provided under other items in the Bid Form. Common fill used to replace excavated rock and boulder will be paid for under Item 4.

1.06 EXCAVATION BELOW NORMAL GRADE (Item 6)

A. Measurement

1. Measurement of earth excavation and refill below normal grade (Item 6) will extend only downward for a width of 4.0 feet measured 2.0 feet on each side of the pipe center to a depth determined by the Engineer in the field.
2. If the trench bottom is below normal grade through error by the Contractor or if improper drainage softens the sub grade and additional excavation in the trench is required before laying the pipe, such removal and replacement of material will not be measured for payment.

B. Payment

1. Payment for earth excavation and refill below normal grade will be made for the quantity as above-determined at the price per cubic yard bid for Item 6 in the Bid Form. Price and payment shall be full compensation for excavation and disposal of all materials below normal grade, furnishing, placing and compacting screened gravel, and all other work incidental thereto for which separate payment is not provided under other items in the Bid Form.

1.07 HYDRANT ASSEMBLIES (item 7)

A. Measurement

1. Connections to new hydrant assemblies and existing hydrants shall be measured as the number of each actually installed in the completed project and accepted by the Engineer.

B. Payment

1. Payment for new hydrant assemblies shall be full compensation for furnishing and installing ductile iron gate valves, with boxes and covers, 6-inch restrained joint cement-lined ductile iron pipe, tie rods and clamps, hydrants, paving and all appurtenances required for the satisfactory completion of this item. Price and payment shall be full compensation for cutting existing pavement; trench excavation including excavation below normal grade (excluding rock and boulder excavation); laying and joining pipes, hydrants and fittings; thrust blocks at tees and bends; screened gravel for drainage pocket and utility crossings; field painting hydrants in proper color designation; removing existing hydrants on abandoned water mains, including the locating and of the existing gate valve box and cover, and delivery of the removed hydrant, gate valve box and cover to the DPW Yard, and closing the existing gate valve; backfilling; and restoring the trench surface to grade.
2. Payment for installing anchoring tees for each hydrant assembly is included under Items 1a through 1f.
3. Payment for rock and boulder excavation will be made under Items 4a and 4b.

1.08 MISCELLANEOUS WORK AND CLEANUP

A. Measurement and Payment

1. Payment for miscellaneous work and cleanup is included in the unit bid costs for Items 1a through 1f in the Bid Form. This price shall be full compensation for all labor, materials, equipment and incidentals required to do all the work specified in

Section 02901 and video taping and the pictures of the work site as specified in Section 01300, and includes work not specifically included under other items but which are obviously necessary for the proper completion of the Contract. Work to cut and plug abandoned mains and to remove existing abandoned gate boxes and covers shall be under this item.

1.09 REMOVAL OF OBSTRUCTIONS (item 8)

A. Measurement

1. Obstructions shall be measured as the actual number of obstructions removed in the completed project and accepted by the Engineer.

B. Payment

1. Payment for removal of obstructions not shown on the plans shall be full compensation for removing and replacing bends, offset, buried gates or other obstruction that would prohibit the travel of mechanical clearers or cement lining equipment through the pipe, including all appurtenances required for the satisfactory completion of this item. Price and payment shall be full compensation for cutting existing pavement; trench excavation including excavation below normal grade (excluding rock and boulder excavation); furnishing, laying and joining pipes and fittings; thrust blocks at tees and bends; screened gravel for drainage pocket and utility crossings; trench bracing; backfilling; and restoring the trench surface to grade.
3. Payment for rock and boulder excavation will be made under Items 4a and 4b.

1.10 TEMPORARY SERVICE PIPE, TEMPORARY SERVICES AND HYDRANTS

A. Measurement and Payment

1. Payment of the unit bid price in Items 1a thru 1h shall be full compensation for all labor, equipment, materials and incidentals necessary to install and remove temporary water service to all one, two, three family residences, commercial establishments and fire protection by the methods described in Section 02656. Price and payment shall be full compensation for cutting existing pavement, trench excavation (excluding rock and boulder), furnishing, installing, and removing all piping materials, corporation stops, fittings, hoses, sidewalk cutting and replacement, and all work required for or incidental to the satisfactory completion of this Item. Temporary hydrants shall replace all hydrants deactivated during the cleaning and lining work and shall be supplied by minimum 6-inch diameter temporary services lines.

SECTION 01046

CONTROL OF WORK

PART 1 GENERAL

1.01 PLANT

- A. Furnish plant and equipment which will be efficient, appropriate and large enough to secure a satisfactory quality of work and a rate of progress which will ensure the completion of the work within the Contract Time. If at any time such plant appears to be inefficient, inappropriate or insufficient for securing the quality of work required or for producing the rate of progress aforesaid, Engineer may order the Contractor to increase the efficiency, change the character or increase the plant equipment and the Contractor shall conform to such order. Failure of the Engineer to give such order shall in no way relieve the Contractor of his obligations to secure the quality of the work and rate of progress required.

1.02 PRIVATE LAND

- A. Do not enter or occupy private land outside of easements, except by permission of the land owner.

1.03 PIPE LOCATIONS

- A. Locate pipelines substantially as indicated on the Drawings. The Engineer reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing structures or for other reasons. Where fittings are noted on the Drawings, such notation is for the Contractor's convenience and does not relieve him from laying and jointing different or additional items where required.

1.04 OPEN EXCAVATIONS

- A. Adequately safeguard all open excavations by providing temporary barricades, caution signs, lights and other means to prevent accidents to persons and damage to property. Provide suitable and safe bridges and other crossings for accommodating travel by pedestrians and workmen. Remove bridges provided for access during construction when no longer required. The length or size of excavation will be controlled by the particular surrounding conditions, but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, the Engineer may require special construction procedures such as limiting the length of the open trench, prohibiting stacking excavated material in the street and requiring that the trench shall not remain open overnight.
- B. Take precautions to prevent injury to the public due to open trenches. Provide adequate light at all trenches, excavated material, equipment, or other obstacles which could be dangerous to the public at night.

1.05 TEST PITS

- A. Excavate test pits, at the direction of the Engineer, to locate underground pipelines or structures in advance of the construction. Backfill test pits immediately after their purpose has been satisfied and restore and maintain the surface in a manner satisfactory to the Engineer.

1.06 MAINTENANCE OF TRAFFIC

- A. Unless permission to close a street is received in writing from the proper authority, place all excavated material so that vehicular and pedestrian traffic may be maintained at all times. If the construction operations cause traffic hazards, repair the road surface, provide temporary ways, erect wheel guards or fences, or take other measures for safety satisfactory to the Engineer.
- B. Detours around construction will be subject to the approval of the Owner and the Engineer. Where detours are permitted, provide all necessary barricades and signs as required to divert the flow of traffic. Expedite construction operations while traffic is detoured. Periods when traffic is being detoured will be strictly controlled by the Owner.
- C. Take precautions to prevent injury to the public due to open trenches. Night watchmen may be required where special hazards exist, or police protection provided for traffic while work is in progress. Be fully responsible for damage or injuries whether or not police protection has been provided.

1.07 CARE AND PROTECTION OF PROPERTY

- A. Be responsible for the preservation of all public and private property and use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work on the part of the Contractor, restore such property to a condition similar or equal to that existing before the damage was done, or make good the damage in other manner acceptable to the Engineer.

1.08 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES

- A. Assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including poles, signs, services to buildings, utilities in the street, gas pipes, water pipes, hydrants, sewers, drains and electric and telephone cables, whether or not they are shown on the Drawings. Carefully support and protect all such structures and utilities from injury of any kind. Immediately repair any damage resulting from the construction operations.
- B. Assistance will be given the Contractor in determining the location of existing services. The Contractor, however, shall bear full responsibility for obtaining all locations of underground structures and utilities (including existing water services, drain lines and sewers). Maintain services to buildings and pay costs or charges resulting from damage thereto.
- C. Notify all utility companies in writing at least 72 hours (excluding Saturdays, Sundays and Legal holidays) before excavating in any public way. Also notify Massachusetts Dig Safe, telephone 1-888-344-7233 at least 72 hours prior to start of work.
- D. If, in the opinion of the Owner, permanent relocation of a utility owned by the Owner is required, the Owner may direct the Contractor, in writing, to perform the work. Work so ordered will be paid for at the Contract unit prices, if applicable, or as extra work under Article 11 of the Supplementary Conditions. If relocation of a privately owned utility is required, the Owner will notify the Utility to perform the work as expeditiously as possible. Cooperate with the Owner and Utility. No claim for delay will be allowed due to such relocation.

- E. Coordinate the removal and replacement of traffic loops and signals, if required for the performance of the work, at no additional cost to the Owner.

1.09 WATER FOR CONSTRUCTION PURPOSES

- A. In locations where public water supply is available, the Contractor may be allowed to use water without charge for construction purposes.
- B. The express approval of the Owner shall be obtained before water is used. Waste of water shall be sufficient cause for withdrawing the privilege of unrestricted use. Hydrants shall only be operated under the supervision of the Owner's personnel.

1.10 MAINTENANCE OF FLOW

- A. Provide for the flow of sewers, drains and water courses interrupted during the progress of the work, and immediately cart away and remove all offensive matter. Discuss the entire procedure of maintaining existing flow with the Engineer well in advance of the interruption of any flow.

1.11 COOPERATION WITHIN THIS CONTRACT

- A. All firms or persons authorized to perform any work under this Contract shall cooperate with General Contractor and Subcontractors or trades and assist in incorporating the work of other trades where necessary or required.
- B. Cutting and patching, drilling and fitting shall be carried out where required by the trade or subcontractor having jurisdiction, unless otherwise indicated herein or directed by the Engineer.

1.12 CLEANUP AND DISPOSAL OF EXCESS MATERIAL

- A. During the course of the work, keep the site of operations as clean and neat as possible. Dispose of all residue resulting from the construction work and, at the conclusion of the work, remove and haul away any surplus excavation, broken pavement, lumber, equipment, temporary structures and any other refuse remaining from the construction operations and leave the entire site of the work in a neat and orderly condition.
- B. In order to prevent environmental pollution arising from the construction activities related to the performance of this Contract, comply with all applicable Federal, State and local laws and regulations concerning waste material disposal, as well as the specific requirements stated in this Section and in other related Sections.
- C. Disposal of excess excavated material in wetlands, stream corridors and plains is strictly prohibited even if the permission of the property owner is obtained. Any violation of this restriction by the Contractor or any person employed by him will be brought to the immediate attention of the responsible regulatory agencies, with a request that appropriate action be taken against the offending parties. The Contractor will be required to remove the fill and restore the area impacted at no increase in the Contract Price.

1.13 RESTORATION

- A. The Contractor is required to restore all areas to conditions that existed prior to construction. Restoration outside of the pipe trench limits required as a result of the installation of the pipeline

shall be at the Contractor's own expense. Restoration within the pipe trench limits is included in the pipe items in the Bid Form.

- B. Existing public and private driveways and sidewalks disturbed by the construction shall be replaced to the limits and thicknesses existing prior to construction.
- C. Existing signs, lampposts, mailboxes, fences, and stone walls which may be damaged by the Contractor or removed by the Contractor during the course of project shall be reinstalled in a vertical position at the same location from which they were removed. Damaged items shall be replaced with an item equal to or better than the damaged items. A concrete anchor shall be provided as necessary, at no additional cost, to ensure a rigid alignment. Care shall be exercised in the reinstallation of all items to prevent damage to the newly installed pipelines or vaults.
- D. Existing concrete, bituminous, timber, and granite curbing shall be protected. If necessary, curbing shall be removed and replaced after backfilling. Curbing which is damaged during construction shall be replaced with curbing of equal quality and dimension at the Contractor's expense. Granite curbing removed and reset shall conform to Section 580 of the Massachusetts DPW Specifications. Joints between sections shall be pointed as required after resetting. Bituminous berms shall conform to Section 501 of the Mass DPW Specifications.

END OF SECTION

SECTION 01110

ENVIRONMENTAL PROTECTION PROCEDURES

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials and equipment and perform all work required for the prevention of environmental pollution in conformance with applicable laws and regulations, during and as the result of construction operations under this Contract. For the purpose of this Section, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic and/or recreational purposes.
- B. The control of environmental pollution requires consideration of air, water and land, and involves management of noise and solid waste, as well as other pollutants.
- C. Schedule and conduct all work in a manner that will minimize the erosion of soils in the area of the work. Provide erosion control measures such as diversion channels, sedimentation or filtration systems, berms, staked hay bales, seeding, mulching or other special surface treatments as are required to prevent silting and muddying of streams, rivers, impoundments, lakes, etc. All erosion control measures shall be in place in an area prior to any construction activity in that area. Specific requirements for erosion and sedimentation controls are specified in Section 02270.
- D. This Section is intended to ensure that construction is achieved with a minimum of disturbance to the existing ecological balance between a water resource and its surroundings. These are general guidelines. It is the Contractor's responsibility to determine the specific construction techniques to meet these guidelines.

1.02 APPLICABLE REGULATIONS

- A. Comply with all applicable Federal, State and local laws and regulations concerning environmental pollution control and abatement.

1.03 NOTIFICATIONS

- A. The Engineer will notify the Contractor in writing of any non-compliance with the foregoing provisions or of any environmentally objectional acts and corrective action to be taken. State or local agencies responsible for verification of certain aspects of the environmental protection requirements shall notify the Contractor in writing, through the Engineer, of any non-compliance with State or local requirements. After receipt of such notice from the Engineer or from the regulatory agency through the Engineer, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails or refuses to comply promptly, the Owner may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor unless it is later determined that the Contractor was in compliance.

1.04 IMPLEMENTATION

- A. Prior to commencement of the work, meet with the Owner to develop mutual understandings relative to compliance with these provisions and administration of the environmental pollution control program.
- B. Remove temporary environmental control features, when approved by the Engineer and incorporate permanent control features into the project at the earliest practicable time.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 EROSION CONTROL

- A. Provide positive means of erosion control such as shallow ditches around construction to carry off surface water. Erosion control measures, such as siltation basins, hay check dams, mulching, jute netting and other equivalent techniques, shall be used as appropriate. Flow of surface water into excavated areas shall be prevented. Ditches around construction area shall also be used to carry away water resulting from dewatering of excavated areas. At the completion of the work, ditches shall be backfilled and the ground surface restored to original condition.

3.02 PROTECTION OF STREAMS AND SURFACE WATERS

- A. Take all precautions to prevent, or reduce to a minimum, any damage to any stream or surface water from pollution by debris, sediment or other material, or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the stream, shall not be directly returned to the stream. Divert such waters through a settling basin or filter before being directed into streams or surface waters.
- B. Do not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water or any storm sewer. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels.
- C. Take all preventative measures to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action.
- D. Water being flushed from structures or pipelines after disinfection, with a Cl₂ residue of 1mg/l or greater, shall be treated with a dechlorination solution, in a method approved by the Engineer, prior to discharge.

3.03 PROTECTION OF LAND RESOURCES

- A. Restore land resources within the project boundaries and outside the limits of permanent work to a condition, after completion of construction, that will appear to be natural and not detract from the appearance of the project. Confine all construction activities to areas shown on the Drawings.

- B. Outside of areas requiring earthwork for the construction of the new facilities, do not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Engineer. Where such special emergency use is permitted, first wrap the trunk with a sufficient thickness of burlap or rags over which softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.
- C. Before beginning operations near them, protect trees that may possibly be defaced, bruised, injured, or otherwise damaged by the construction equipment, dumping or other operations, by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly.
- D. Any trees or other landscape features scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to their original condition. The Engineer will decide the method of restoration to be used and whether damaged trees shall be treated and healed or removed and disposed of.
 - 1. All scars made on trees by equipment, construction operations, or by the removal of limbs larger than 1-in in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.
 - 2. Climbing ropes shall be used where necessary for safety. Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and are beyond saving in the opinion of the Engineer, shall be immediately removed and replaced.
- E. The locations of the Contractor's storage and other construction buildings, required temporarily in the performance of the work, shall be cleared portions of the job site or areas to be cleared as shown on the Drawings and approved by the Engineer and shall not be within wetlands or floodplains. The preservation of the landscape shall be an imperative consideration in the selection of all sites and in the construction of buildings. Drawings showing storage facilities shall be submitted for approval of the Engineer.
- F. If the Contractor proposes to construct temporary roads or embankments and excavations for plant and/or work areas, he shall submit the following for approval at least ten days prior to scheduled start of such temporary work.
 - 1. A layout of all temporary roads, excavations, embankments and drainage to be constructed within the work area.
 - 2. Details of temporary road construction.
 - 3. Drawings and cross sections of proposed embankments and their foundations, including a description of proposed materials.
 - 4. A landscaping drawing showing the proposed restoration of the area. Indicate the proposed removal of any trees and shrubs outside the limits of existing clearing area. Indicate locations of guard posts or barriers required to control vehicular traffic and protect trees

and shrubs to be maintained undamaged. The Drawing shall provide for the obliteration of construction scars as such and shall provide for a natural appearing final condition of the area. Modification of the Contractor's approved drawings shall be made only with the written approval of the Engineer. No unauthorized road construction, excavation or embankment construction including disposal areas will be permitted.

- G. Remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess of waste materials, or any other vestiges of construction as directed by the Engineer. It is anticipated that excavation, filling and plowing of roadways will be required to restore the area to near natural conditions which will permit the growth of vegetation thereon. The disturbed areas shall be prepared and seeded as described in Section 02930, or as approved by the Engineer.
- H. All debris and excess material will be disposed of outside wetland or floodplain areas in an environmentally sound manner.

3.04 PROTECTION OF AIR QUALITY

- A. Burning - The use of burning at the project site for the disposal of refuse and debris will not be permitted.
- B. Dust Control - Maintain all excavations, embankment, stockpiles, access roads, plant sites, waste areas, borrow areas and all other work areas within or without the project boundaries free from dust which could cause the standards for air pollution to be exceeded and which would cause a hazard or nuisance to others.
- C. An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. The use of petroleum products is prohibited. The use of chlorides may be permitted with approval from the Engineer.
- D. Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor shall have sufficient competent equipment on the job to accomplish this. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs, as determined by the Engineer.

3.05 NOISE CONTROL

- A. Make every effort to minimize noises caused by the construction operations. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with Federal and State regulations.

3.06 MAINTENANCE OF POLLUTION CONTROL FACILITIES DURING CONSTRUCTION

- A. Maintain all facilities constructed for pollution control as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created.

END OF SECTION

SECTION 01170

SPECIAL PROVISIONS

PART 1 GENERAL

1.01 GENERAL OBLIGATIONS OF THE CONTRACTOR

- A. General obligations of the Contractor shall be as set forth in the Contract Documents. Unless special payment is specifically provided in Section 01025, all incidental work and expense in connection with the completion of work under the Contract will be considered a subsidiary obligation of the Contractor and all such costs shall be included in the appropriate items in the Bid Form in connection with which the costs are incurred.

1.02 SITE INVESTIGATION

- A. The Contractor shall satisfy himself as to the conditions existing within the project area, the type of equipment required to perform the work, the character, quality and quantity of the subsurface materials to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, as well as from information presented by the Drawings and related Sections. Any failure of the Contractor to acquaint himself with the available information will not relieve him from the responsibility for estimating properly the difficulty or cost of successfully performing the work. The Owner assumes no responsibility for any conclusions or interpretation made by the Contractor on the basis of the information made available by the Owner.

1.03 COORDINATION WITH LOCAL AGENCIES

- A. Supply the Local Police Department, Fire Department, School Department, Conservation Commission and the Public Works Department with the following information:
 - 1. A list of streets and intersections where work will be in progress.
 - 2. Areas where approved detours are in effect.
 - 3. Immediate notification of any drain, gas or water main breaks.
- B. Reimburse the Owner for the actual cost of the services of Water Department Personnel required during other than regular working hours. The emergency contact number for the Water Department during non-business hours is (781) 897-5945.
- C. Maintain pavement as specified in Division 2 and provide the Public Works Department with an address where the Contractor may be reached when not at the site. Upon notification by the Owner or the Engineer, promptly make such repairs as necessary to paved surfaces.

1.04 PUBLIC UTILITIES

- A. Comply with the requirements of the Commonwealth of Massachusetts Statute - Chapter 82, Section 40, for excavations in public and private property. Compliance shall include the following:
 - 1. Notify public utility companies in writing at least 72 hours (excluding Saturdays, Sundays and legal holidays) but not more than 30 days before excavating in areas where underground utility plant (pipes, cables, manholes, etc) exist.
 - 2. Provide the Utility Companies with a schedule of the activities in areas where the utilities exist.
 - 3. Notify utility companies of any damage to their utilities resulting from construction operations.
- B. Notify DIGSAFE at 1-888-344-7233 at least 72 hours before digging, trenching, blasting, demolishing, boring, backfilling, grading, landscaping or other earth moving operations in any public ways, rights of way and easements.

1.05 PROGRESS SCHEDULE

- A. Submit a progress schedule before starting any work, in accordance with Article 2.6 of the General Conditions.
- B. Review the progress schedule with the Engineer on a monthly basis or more frequently as required by the Engineer. The progress schedule shall be adjusted as required in accordance with the General Conditions.

1.06 PROVISIONS FOR CONTROL OF EROSION

- A. Portions of the work potentially impact upon restricted wetland areas. Comply with the "ORDER OF CONDITIONS" issued for this project work.
- B. Take sufficient precautions during construction to minimize the run-off of polluting substances such as silt, clay, fuels, oils, bitumens and calcium chloride into the supplies and surface waters of the State. Special precautions shall be taken in the use of construction equipment to prevent operations which promote erosion.
- B. Disposal of drainage shall be in an area approved by the Owner. Prevent the flow or seepage of drainage back into the drainage area. Drainage shall not be disposed of until silt and other sedimentary materials have been removed. Particular care shall be taken to prevent the discharge of unsuitable drainage to a water supply or surface water body.
- C. As a minimum, the following shall apply:
 - 1. In cross country areas brush and stumps shall not be removed until no more than 1 week prior to the start of pipe laying in that area. The existing ground surface shall be disturbed as little as possible until no more than 1 week prior to the start of pipe laying.

2. Staked bales of hay and/or silt fence shall be provided at points where drainage from the work site leaves the site, to reduce the sediment content of the water. Sufficient bales of hay shall be provided such that all flow will filter through the hay. Other methods which reduce the sediment content to an equal or greater degree may be used as approved by the Engineer.
 3. Drainage leaving the site shall flow in a manner to prevent erosion.
 4. Loaming and seeding or mulching of cross country areas shall take place as soon after laying of the pipeline as practicable. This shall be considered part of the pipeline work and full payment for the pipeline work may not be made until it has been completed.
- D. Measures for control of erosion shall be adequate to assure that turbidity in the receiving water will not be increased more than 10 standard turbidity units (s.t.u.), or as otherwise required by the State or other controlling body, in waters used for public water supply or fish unless limits have been established for the particular water. In surface water used for other purposes, the turbidity shall not exceed 25 s.t.u. unless otherwise permitted.
- E. When excavating in wetlands or a river floodplain, where no temporary diversion structure is required, place the excavated material on the uphill side of the trench so that the trench serves as a barrier between the excavated material and the wetland or flood plain.

1.07 PERMITS

- A. Obtain all necessary permits required for proper execution of the project. Fill out all forms and furnish all drawings required to obtain the permits. A copy of each permit shall be submitted to the Engineer. All fees associated with these permits shall be paid by the Contractor as part of the work. Work shall not commence on any phase of the work requiring a permit until the permit is obtained.
- B. Obtain required street opening permits for excavations within streets or sidewalk areas.
- C. The Contractor shall abide by all permit requirements imposed by the MA Highway Department permit, MWRA or any other state agency permit issued for this project.
- D. Abide by any permit requirements imposed in the wetlands Order of Conditions as issued for the project work.

1.08 DISRUPTIONS TO THE EXISTING WATER SYSTEM

- A. The Contractor shall make test excavations to locate existing water mains where shown on the Drawings. If during the course of the excavation, the Contractor for whatever reason causes the existing water main to fail, the Contractor shall restore service in the shortest possible time, working around the clock if necessary. He/She shall cooperate with the Owner in supplying emergency water.
- B. The Contractor shall minimize the number of disruptions of the water system for the installation of the new piping. If the work requires the interruption of the water service for more than 10 hours, the Contractor may be directed by the Engineer to provide temporary service to the affected areas at no additional cost.

1.09 CONSUMER NOTIFICATION

- A. At least 24 hours prior to a scheduled interruption of water service to any consumer for the purpose of connecting new water mains to old water mains, the Contractor shall, at his own expense, deliver written notification to all premises affected by said interruption of service. The notice shall be similar to the “Notice of Interruption in Water Service” provided in the Appendix.
- B. The contractor shall establish and maintain a 24 hour local emergency telephone number. The telephone number shall be printed on the “Notice of Water service Interruption Form” distributed to effected residents and businesses.

1.10 COOPERATION BY THE OWNER

- A. The Owner will, within 24-hours of notice from the Contractor, operate all valves for draining or admitting water to the various sections of the main, and at the request of the Contractor, dewater such sections of mains to the extent possible by gravity, but the Contractor shall be responsible for removing the remainder of the water and for dewatering the excavated area. No damage shall be claimed by the Contractor for delays in dewatering pipe lines whether or not such dewatering is done by him or by the Owner nor shall any damage be claimed because of water leaking through closed valves after dewatering is completed.
- B. The Owner will refill the mainline and sideline connections in the various sections of the work after all pipe closures have been made by the Contractor. All air must be purged from the mains before they can be re-pressurized, and the Contractor shall have no claim for delay while the Owner accomplishes this. The Owner may take taps for this purpose in the new piping at his discretion.

1.11 SPECIAL CONSTRUCTION SCHEDULE REQUIREMENTS

- A. At least one lane of two-way traffic shall be maintained on all roads where work is to be performed.
- B. Temporary water service will not be allowed after November 1 or before March 30.
- C. No work shall be performed during winter shutdown, November 15 to March 15, except for repair.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 DESCRIPTION OF REQUIREMENTS

- A. This Section specifies the general methods and requirements of submissions applicable to Shop Drawings, Product Data, Samples, Construction Photographs, Construction or Submittal Schedules. Additional general submission requirements are contained in Article 6.17 of the General Conditions. Detailed submittal requirements are specified in the technical Sections.
- B. All submittals shall be clearly identified by reference to Section Number, Paragraph, Drawing Number or Detail as applicable. Submittals shall be clear and legible and of sufficient size for presentation of data.

1.02 SHOP DRAWINGS, PRODUCT DATA, SAMPLES

A. Shop Drawings

- 1. Shop drawings as specified in individual Sections include, custom-prepared data such as fabrication and erection/installation (working) drawings, scheduled information, setting diagrams, actual shopwork manufacturing instructions, custom templates, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports including performance curves and certifications, as applicable to the work.
- 2. All shop drawings submitted by subcontractors shall be sent directly to the Contractor for checking. The Contractor shall be responsible for their submission at the proper time so as to prevent delays in delivery of materials.
- 3. Check all subcontractor's shop drawings regarding measurements, size of members, materials and details to make sure that they conform to the intent of the Drawings and related Sections. Return shop drawings found to be inaccurate or otherwise in error to the subcontractors for correction before submission thereof.
- 4. All details on shop drawings shall show clearly the relation of the various parts to the main members and lines of the structure and where correct fabrication of the work depends upon field measurements, such measurements shall be made and noted on the drawings before being submitted.
- 5. Submittals for equipment specified under Division 2 shall include a listing of all installations where identical or similar equipment has been installed and been in operation for a period of at least one year.

B. Product Data

- 1. Product data as specified in individual Sections include, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed

performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing and printed product warranties, as applicable to the work.

C. Samples

1. Samples specified in individual Sections include, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols and units of work to be used by the Engineer or Owner for independent inspection and testing, as applicable to the work.

1.03 CONTRACTOR'S RESPONSIBILITIES

- A. Review shop drawings, product data and samples, including those by subcontractors, prior to submission to determine and verify the following:
 1. Field measurements
 2. Field construction criteria
 3. Catalog numbers and similar data
 4. Conformance with related Sections
- B. Each shop drawing, sample and product data submitted by the Contractor shall have affixed to it the following Certification Statement including the Contractor's Company name and signed by the Contractor: "Certification Statement: by this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements." Shop drawings and product data sheets 11-in x 17-in and smaller shall be bound together in an orderly fashion and bear the above Certification Statement on the cover sheet. The cover sheet shall fully describe the packaged data and include a listing of all items within the package. Provide to the Resident Project Representative a copy of each transmittal sheet for shop drawings, product data and samples at the time of submittal to the Engineer.
- C. Notify the Engineer in writing, at the time of submittal, of any deviations in the submittals from the requirements of the Contract Documents.
- D. The review and approval of shop drawings, samples or product data by the Engineer shall not relieve the Contractor from the responsibility for the fulfillment of the terms of the Contract. All risks of error and omission are assumed by the Contractor and the Engineer will have no responsibility therefor.
- E. No portion of the work requiring a shop drawing, sample, or product data shall be started nor shall any materials be fabricated or installed prior to the approval or qualified approval of such item. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved shop drawings and data shall be at the Contractor's risk. The Owner will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.

- F. Project work, materials, fabrication, and installation shall conform with approved shop drawings, applicable samples, and product data.

1.04 SUBMISSION REQUIREMENTS

- A. Make submittals promptly in accordance with approved schedule and in such sequence as to cause no delay in the Work or in the work of any other contractor.
- B. Each submittal, appropriately coded, will be returned within 30 working days following receipt of submittal by the Engineer.
- C. Number of submittals required:
 - 1. Shop Drawings: Six copies.
 - 2. Product Data: Three copies.
 - 3. Samples: Submit the number stated in the respective Sections.
- D. Submittals shall contain:
 - 1. The date of submission and the dates of any previous submissions.
 - 2. The Project title and number.
 - 3. Contractor identification.
 - 4. The names of:
 - a. Contractor
 - b. Supplier
 - c. Manufacturer
 - 5. Identification of the product, with the section number, page and paragraph(s).
 - 6. Field dimensions, clearly identified as such.
 - 7. Relation to adjacent or critical features of the work or materials.
 - 8. Applicable standards, such as ASTM or Federal Standards numbers.
 - 9. Identification of deviations from Contract Documents.
 - 10. Identification of revisions on resubmittals.
 - 11. An 8-in by 3-in blank space for Contractor and Engineer stamps.

12. Where calculations are required to be submitted by the Contractor, the calculations shall have been checked by a qualified individual other than the preparer. The submitted calculations shall clearly show the names of the preparer and of the checker.

1.05 REVIEW OF SHOP DRAWINGS, PRODUCT DATA, WORKING DRAWINGS AND SAMPLES

- A. The review of shop drawings, data and samples will be for general conformance with the design concept and Contract Documents. They shall not be construed:
 1. As permitting any departure from the Contract requirements;
 2. As relieving the Contractor of responsibility for any errors, including details, dimensions, and materials;
 3. As approving departures from details furnished by the Engineer, except as otherwise provided herein.
- B. The Contractor remains responsible for details and accuracy, for coordinating the work with all other associated work and trades, for selecting fabrication processes, for techniques of assembly, and for performing work in a safe manner.
- C. If the shop drawings, data or samples as submitted describe variations and show a departure from the Contract requirements which Engineer finds to be in the interest of the Owner and to be so minor as not to involve a change in Contract Price or Contract Time, the Engineer may return the reviewed drawings without noting an exception.
- D. Submittals will be returned to the Contractor under one of the following codes.

Code 1 - "APPROVED" is assigned when there are no notations or comments on the submittal. When returned under this code the Contractor may release the equipment and/or material for manufacture.

Code 2 - "APPROVED AS NOTED". This code is assigned when a confirmation of the notations and comments IS NOT required by the Contractor. The Contractor may release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product.

Code 3 - "APPROVED AS NOTED/CONFIRM". This combination of codes is assigned when a confirmation of the notations and comments IS required by the Contractor. The Contractor may, at his own risk, release the equipment or material for manufacture; however, all notations and comments must be incorporated into the final product. This confirmation shall specifically address each omission and nonconforming item that was noted. Confirmation is to be received by the Engineer within 15 calendar days of the date of the Engineer's transmittal requiring the confirmation.

Code 4 - "APPROVED AS NOTED/RESUBMIT". This combination of codes is assigned when notations and comments are extensive enough to require a resubmittal of the package. This resubmittal is to address all comments, omissions and non-conforming items that were noted. Resubmittal is to be received by the Engineer within 15 calendar days of the date of the Engineer's transmittal requiring the resubmittal.

Code 5 - "NOT APPROVED" is assigned when the submittal does not meet the intent of the Contract Documents. The Contractor must resubmit the entire package revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the Contract Documents.

Code 6 - "COMMENTS ATTACHED" is assigned where there are comments attached to the returned submittal which provide additional data to aid the Contractor.

Codes 1 through 5 designate the status of the reviewed submittal with Code 6 showing there has been an attachment of additional data.

- E. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall identify all revisions made to the submittals, either in writing on the letter of transmittal or on the shop drawings by use of revision triangles or other similar methods. The resubmittal shall clearly respond to each comment made by the Engineer on the previous submission. Additionally, the Contractor shall direct specific attention to any revisions made other than the corrections requested by the Engineer on previous submissions.
- F. Partial submittals may not be reviewed. The Engineer will be the only judge as to the completeness of a submittal. Submittals not complete will be returned to the Contractor and will be considered "Not Approved" until resubmitted. The Engineer may at his option provide a list or mark the submittal directing the Contractor to the areas that are incomplete.
- G. Repetitive Review
 - 1. Shop drawings and other submittals will be reviewed no more than twice at the Owner's expense. All subsequent reviews will be performed at times convenient to the Engineer and at the Contractor's expense, based on the Engineer's then prevailing rates. The Contractor shall reimburse the Owner for all such fees invoiced to the Owner by the Engineer. Submittals are required until approved.
 - 2. Any need for more than one resubmission, or any other delay in obtaining Engineer's review of submittals, will not entitle Contractor to extension of the Contract Time.
- H. If the Contractor considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, the Contractor shall give written notice thereof to the Engineer at least 7 working days prior to release for manufacture.
- I. When the shop drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.

1.06 DISTRIBUTION

- A. Distribute reproductions of approved shop drawings and copies of approved product data and samples, where required, to the job site file and elsewhere as directed by the Engineer. Number of copies shall be as directed by the Engineer but shall not exceed six.

1.07 CONSTRUCTION PHOTOGRAPHS

- A. Prior to the start of construction, the Contractor shall have 24 color photographs made of the work locations. The Contractor shall have 36 color photographs per month made of the work during its progress and 24 color photographs of the completed facilities. The photographs shall be of such views and taken at such times as the Engineer directs.
- B. All photographic work shall be done by a qualified, established commercial photographer acceptable to the Engineer. Three prints of each photograph shall be furnished promptly to the Engineer, and each print shall have a glossy finish and be mounted in plastic sleeving on a substantial backing. The overall dimensions of each mounted print shall be 8-in by 10-in with 1-1/4-in flexible binding margin on the long top side to permit storage in standard 3-ring binders.
- C. The film negatives shall be retained in the files of the photographer until the completion of the project and shall then be turned over to the Owner.
- D. Each photograph shall have attached to the backing a paper label, approximately 2-1/4-in wide by 1-3/4-in high containing thereon in neat lettering:
 - 1. Contractor's name
 - 2. Short Description of View
 - 3. Photo Number and Date Taken
 - 4. Photographer's Firm Name

1.08 SCHEDULES

- A. Provide all schedules required by Articles 2.05B, 2.07, 14.01, and elsewhere in the General Conditions.

1.09 PROFESSIONAL ENGINEER (P.E.) CERTIFICATION FORM

- A. If specifically required in other related Sections, submit a P.E. Certification for each item required, in the form attached to this Section, completely filled in and stamped.

1.10 GENERAL PROCEDURES FOR SUBMITTALS

- A. Coordination of Submittal Times: Prepare and transmit each submittal sufficiently in advance of performing the related work or other applicable activities, or within the time specified in the individual work of other related Sections, so that the installation will not be delayed by processing times including disapproval and resubmittal (if required), coordination with other submittals, testing, purchasing, fabrication, delivery and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals sufficiently in advance of the Work.

END OF SECTION

P.E. CERTIFICATION FORM

The undersigned hereby certifies that he/she is a professional engineer registered in the [State] [Commonwealth] of _____ and that he/she has been employed by

_____ to design
(Name of Contractor)

(Insert P.E. Responsibilities)

in accordance with Section _____ for the

_____.
(Name of Project)

The undersigned further certifies that he/she has performed the design of the _____
_____, that said design is in conformance
(Name of Project)

with all applicable local, state and federal codes, rules, and regulations, and that his/her signature and P.E. stamp have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the

(Insert Name of Owner)

or Owner's representative within seven days following written request therefor by the Owner.

P.E. Name

Contractor's Name

Signature

Signature

Address

Title

Address

SECTION 01601

CONTROL OF MATERIALS

PART 1 GENERAL

1.01 APPROVAL OF MATERIALS

- A. Unless otherwise specified, only new materials and equipment shall be incorporated in the work. All materials and equipment furnished shall be subject to the inspection and approval of the Engineer. No material shall be delivered to the work without prior approval of the Engineer.
- B. Submit to the Engineer, in accordance with Section 01300, data relating to materials and equipment proposed to be furnished for the work. Such data shall be in sufficient detail to enable the Engineer to identify the particular product and to form an opinion as to its conformity to the specifications.
- C. Facilities and labor for handling and inspection of all materials and equipment shall be furnished by the Contractor. If the Engineer requires, either prior to beginning or during the progress of the work, submit additional samples or materials for such special tests as may be necessary to demonstrate that they conform to the requirements specified herein. Such samples shall be furnished, stored, packed and shipped as directed at the Contractor's expense. Except as otherwise noted, the Owner will make arrangements for and pay for the tests.
- D. Any delay of approval resulting from the Contractor's failure to submit samples or data promptly shall not be used as a basis of a claim against the Owner or the Engineer.
- E. In order to demonstrate the proficiency of workmen or to facilitate the choice among several textures, types, finishes and surfaces, provide such samples of workmanship or finish as may be required.
- F. The materials and equipment used on the work shall correspond to the approved samples or other data.

1.02 HANDLING AND STORAGE OF MATERIALS

- A. All materials and equipment to be incorporated in the work shall be handled and stored by the manufacturer, fabricator, supplier and Contractor before, during and after shipment in a manner to prevent warping, twisting, bending, breaking, chipping, rusting and any injury, theft or damage of any kind whatsoever to the material or equipment.
- B. Cement and lime shall be stored under a roof and off the ground and shall be kept completely dry at all times. All structural, miscellaneous, reinforcing steel shall be stored off the ground or otherwise to prevent accumulations of dirt or grease and in a position to prevent accumulations of standing water and to minimize rusting. Beams shall be stored with the webs vertical. Precast concrete shall be handled and stored in a manner to prevent accumulations of dirt, standing water, staining, chipping or cracking. Brick, block and similar masonry products shall be handled and stored in a manner to reduce breakage, chipping, cracking and spalling to a minimum.

- C. All mechanical equipment subject to corrosive damage by the atmosphere if stored outdoors (even though covered by canvas) shall be stored in a building to prevent injury. The building may be a temporary structure on the site or elsewhere, but it must be satisfactory to the Engineer.
- D. All materials which, in the opinion of the Engineer, have become so damaged as to be unfit for the use intended or specified shall be promptly removed from the site of the work and no compensation shall be given for the damaged material or its removal.
- E. All pipe and other materials delivered to the job shall be unloaded and placed in a manner which will not hamper the normal operation of the existing plant or interfere with the flow of necessary traffic.

END OF SECTION

SECTION 02140

DEWATERING AND DRAINAGE

PART 1 GENERAL

1.00 STATUTORY REQUIREMENTS

- A. The contractor shall coordinate his use of the municipal drainage system for dewatering purposes with the Department of Public Works..

1.01 SCOPE OF WORK

- A. Furnish, install, operate, monitor, maintain and remove temporary dewatering and drainage systems as required and lower and maintain groundwater levels below subgrades of excavations. Prevent surface water runoff from entering or accumulating in excavations.
- B. Furnish the services of a licensed professional engineer, registered in the State in which the work is located, to prepare dewatering and drainage system designs and submittals.
- C. Collect and properly dispose of all discharge water from dewatering and drainage systems in accordance with State and local requirements and permits.
- D. Repair damage caused by dewatering and drainage system operations.
- E. Remove temporary dewatering and drainage systems when no longer needed. Restore all disturbed areas.

1.02 RELATED WORK

- A. Earth excavation and backfill are included in Section 02221.
- B. Sedimentation and erosion control is included in Section 02270.

1.03 SUBMITTALS

- A. Dewatering and drainage system designs shall be prepared by a licensed professional engineer, registered in the State in which the work is located, having a minimum of 5 years of professional experience in the design and construction of dewatering and drainage systems. Submit an original and three copies of the licensed professional engineer's certification, on the PE form specified in Section 01300, stating that the dewatering and drainage system designs have been prepared by the professional engineer and that the professional engineer will be responsible for their execution. Do not submit dewatering and drainage system designs unless requested in writing.

1.11 DEFINITIONS

- A. Where the phrase "in-the-dry" is used in this Section, it shall be defined as in situ soil moisture content of no more than two percentage points above the optimum moisture content for that soil.

PART 2 PRODUCTS

(None this Section)

PART 3 EXECUTION

3.01 GENERAL

- A. Control surface water and groundwater such that excavation to final grade is made in-the-dry, and bearing soils are maintained undisturbed. Prevent softening, or instability of, or disturbance to, the subgrade due to water seepage.
- B. Provide protection against flotation for all work.
- C. The impact of anticipated subsurface soil/water conditions shall be considered when selecting methods of excavation and temporary dewatering and drainage systems. Where groundwater levels are above the proposed bottoms of excavations, a pumped dewatering system is expected for predrainage of the soils prior to excavation to final grade and for maintenance of the lowered groundwater level until construction has been completed to such an extent that the foundation, structure, pipe, conduit, or fill will not be floated or otherwise damaged. Type of dewatering system, spacing of dewatering units and other details of the work are expected to vary with soil/water conditions at a particular location.

3.02 SURFACE WATER CONTROL

- A. Control surface water runoff to prevent flow into excavations. Provide temporary measures such as dikes, ditches and sumps.

3.03 EXCAVATION DEWATERING

- A. Provide and maintain adequate equipment and facilities to remove promptly and dispose of properly all water entering excavations. Excavations shall be kept in-the-dry, so as to maintain an undisturbed subgrade condition throughout construction below grade, including backfill and fill placement.
- B. Collect precipitation or surface runoff in shallow ditches around the perimeter of the excavation, drain to sump and pump from the excavation to maintain in-the-dry conditions.
- C. Pipe and conduit shall not be installed in water or allowed to be submerged prior to backfilling. Pipe and conduit which becomes submerged shall be removed and the excavation dewatered and restored to proper conditions prior to reinstalling the pipe and conduit.
- D. Excavations for foundations and structures shall be maintained in-the-dry for a minimum of 4 days after concrete placement. In no event shall water be allowed to enter an excavation and rise to cause unbalanced pressure on foundations and structures until the concrete or mortar has set at least 24 hours.
- E. Dewatering and drainage operations shall at all times be conducted in such a manner as to preserve the natural undisturbed bearing capacity of the subgrade at the bottom of the excavation. If the subgrade becomes disturbed for any reason, the unsuitable subgrade material

shall be removed and replaced with concrete, compacted granular fill, or other approved material to restore the bearing capacity of the subgrade to its original undisturbed condition.

- F. Dewatering and drainage operations shall be conducted in a manner which does not cause loss of ground or disturbance to the pipe bedding or soil which supports overlying or adjacent structures.

3.04 DISPOSAL OF DRAINAGE

- A. All water discharged from temporary dewatering and drainage systems shall be disposed of in accordance with the sedimentation and control plans as specified in Section 01110. Existing or new sanitary sewer systems shall not be used to dispose of drainage unless the written permission of the utility or owner is obtained.

END OF SECTION

SECTION 02213

ROCK AND BOULDER EXCAVATION

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and excavate and dispose of rock and boulders as shown on the Drawings and as specified herein.
- B. Blasting will not be permitted on this project without prior written authorization of the owner.

1.02 RELATED WORK

- A. Earth excavation and backfilling are included in Section 02221.
- B. Environmental Protection is included in Section 02270.

1.03 SUBMITTALS

- A. Submit to the Engineer, in accordance with Section 01300, the proposed methods of excavation for the various portions of the work. Submittals shall be for information only. Remain responsible for means, methods and techniques, as well as all safety considerations.

1.04 DEFINITIONS

- A. Rock: Any large mass of stone, bedrock, or ledgerock.
- B. Boulder: Rock fragments exceeding 1 cu yd in volume.
- C. Rock Excavation: The removal of solid rock or rock fragments greater than 1 cu yd in volume which cannot be removed by conventional mechanical excavation equipment or which requires continuous, systematic drilling and blasting, chemical expanders or other special procedures.
- D. Boulder Excavation: The removal of boulders exceeding 1 cu yd in volume which can be excavated without resorting to blasting.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 ROCK EXCAVATION

- A. Rock excavation may be performed by jack hammering, expansive chemical splitting, or other similar process.

3.02 BOULDER EXCAVATION

- A. Boulders and rock fragments up to 1 cu yd in volume may be reduced in size by rock excavation methods to simplify its removal.

3.03 DISPOSAL OF ROCK AND BOULDERS

- A. Fragmented rock with dimensions not exceeding 6-in in any direction may be mixed with common fill and used as common fill in accordance with Section 02221.
- B. Rock and boulders may be crushed and screened for reuse in the work, provided that the resultant materials meet the requirements for gravel, crushed stone, or structural fill as specified in Section 02221.
- C. Unused rock and boulders shall be removed and disposed of off-site.

END OF SECTION

SECTION 02221

TRENCHING, BACKFILLING AND COMPACTION

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and perform all trenching for pipelines and appurtenances, including drainage, filling, backfilling, disposal of surplus material and restoration of trench surfaces and easements.
- B. Excavation shall extend to the width and depth shown on the Drawings or as specified herein and shall provide suitable room for installing pipe, structures and appurtenances.
- C. Furnish and place all sheeting, bracing and supports and shall remove from the excavation all materials which the Engineer may deem unsuitable for backfilling. The bottom of the excavation shall be firm, dry and in all respects, acceptable. If conditions warrant, deposit gravel for pipe bedding, or gravel refill for excavation below grade, directly on the bottom of the trench immediately after excavation has reached the proper depth and before the bottom of the trench has become softened or disturbed by any cause whatever. The length of open trench shall be related closely to the rate of pipe laying. All excavation shall be made in open trenches.
- D. All excavation, trenching and related sheeting, bracing, etc, shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926.650 Subpart P) and to the Massachusetts Department of Labor and Industries, Division of Industrial Safety "Rules and Regulations for the Prevention of Accidents in Construction Operations" (Chapter 454 CMR 10.00 et. seq.). Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.
- E. Wherever the requirement for 95 percent compaction is referred to herein for State roadways it shall mean "at least 95 percent of maximum density as determined by ASTM compaction tests, Designation D1557, Method D". The Contractor shall provide all equipment and incidentals required to perform field tests to verify compaction during work. Compaction tests are required in State Highways and taken at 15 foot intervals in areas where the excavation extends into the traveled way. Wherever the requirement for 92 percent compaction is referred to herein for City roads it shall mean "at least 92 percent of maximum density as determined by ASTM D1557, Method D". Compaction tests shall be performed on the 92 percent compaction if required by Engineer.
- F. Prior to the start of work submit the proposed method of backfilling and compaction to the Engineer for review.

1.02 RELATED WORK

- A. Rock and boulder excavation is included in Section 02213.
- B. Granular fill materials are included in Section 02230.

- C. Dewatering is included in Section 02140.
- D. Pavement repair and resurfacing is included in Section 02576.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 TRENCH EXCAVATION

- A. Trench excavation shall include material of every description and of whatever substance encountered, except rock and boulders. Pavement shall be cut with a saw, wheel or pneumatic chisel along straight lines before excavating.
- B. Strip and stockpile topsoil from grassed areas crossed by trenches. At the Contractor's option, topsoil may be otherwise disposed of and replaced, when required, with approved topsoil of equal quality.
- C. While excavating and backfilling is in progress, traffic shall be maintained, and all utilities and other property protected as provided in the General Conditions and General Requirements.
- D. Trenches shall be excavated to the depth indicated on the Drawings and in widths sufficient for laying the pipe, bracing and for pumping and drainage facilities. The bottom of the excavations shall be firm and dry and in all respects acceptable to the Engineer. Trench width shall be practical minimum.
- E. Excavation and dewatering shall be accomplished by methods which preserve the undisturbed state of sub grade soils. The trench may be excavated by machinery to, or just below the designated sub grade, provided that material remaining in the bottom of the trench is no more than slightly disturbed. Sub grade soils which become soft, loose, "quick", or otherwise unsatisfactory as a result of inadequate excavation, dewatering or other construction methods shall be removed and replaced by screened gravel fill as required by the Engineer at the Contractor's expense.
- F. Clay and organic silt soils are particularly susceptible to disturbance due to construction operations. When excavation is to end in such soils, use a smooth edge bucket to excavate the last 1-ft of depth.
- G. Where pipe is to be laid in screened gravel bedding, the trench may be excavated by machinery to the normal depth of the pipe provided that the material remaining in the bottom of the trench is no more than slightly disturbed.
- H. Where pipe is to be laid directly on the trench bottom, final excavation at the bottom of the trench shall be performed manually, providing a flat bottom true to grade upon undisturbed material. Bell holes shall be made as required.

3.02 DISPOSAL OF MATERIALS

- A. Excavated material shall be stacked without excessive surcharge on the trench bank or obstructing free access to hydrants and gate valves. Inconvenience to traffic and abutters shall be

avoided as much as possible. Excavated material shall be segregated for use in backfilling as specified below.

- B. It is expressly understood that no excavated material shall be removed from the site of the work or disposed of, except as directed by the Engineer. When removal of surplus materials has been approved by the Engineer, dispose of such surplus material in approved designated areas.
- C. Should conditions make it impracticable or unsafe to stack material adjacent to the trench, the material shall be hauled and stored at a location provided. When required, it shall be re-handled and used in backfilling the trench.

3.03 SHEETING AND BRACING

- A. Furnish, put in place and maintain sheeting and bracing required by Federal, State or local safety requirements to support the sides of the excavation and prevent loss of ground which could endanger personnel, damage or delay the work or endanger adjacent structures. If the Engineer is of the opinion that at any point sufficient or proper supports have not been provided, he/she may order additional supports placed at the expense of the Contractor. Compliance with such order shall not relieve the Contractor from his/her responsibility for the sufficiency of such supports. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed, they shall be immediately filled and rammed.
- B. Where sheeting and bracing is required to support the sides of trenches, engage a professional engineer, registered in the Commonwealth of Massachusetts, to design the sheeting and bracing. The sheeting and bracing installed shall be in conformity with the design and certification of this shall be provided by the professional engineer. Submit P.E. Certification Form contained in Section 01300 to show compliance with this requirement.
- C. When moveable trench bracing such as trench boxes, moveable sheeting, shoring or plates are used to support the sides of the trench, care shall be taken in placing and moving the boxes or supporting bracing to prevent movement of the pipe, or disturbance of the pipe bedding and the screened gravel backfill.
 - 1. When installing rigid pipe (R.C., V.C., A.C., etc), any portion of the box extending below mid diameter shall be raised above this point prior to moving the box ahead to install the next pipe. This is to prevent the separation of installed pipe joints due to movement of the box.
 - 2. When installing flexible pipe (PVC, etc), trench boxes, moveable sheeting, shoring or plates shall not be allowed to extend below mid-diameter of the pipe. As trench boxes, moveable sheeting, shoring or plates are moved, screened gravel shall be placed to fill any voids created and the screened gravel and backfill shall be recompacted to provide uniform side support for the pipe.
- D. Permission will be given to use steel sheeting in lieu of wood sheeting for the entire job wherever the use of sheeting is necessary. The cost for use of sheeting will be included in the bid items for pipe and shall include full compensation for driving, bracing and later removal of sheeting.
- E. All sheeting and bracing shall be carefully removed in such manner as not to endanger the construction of other structures, utilities, or property, whether public or private. All voids left

after withdrawal of sheeting shall be immediately refilled with sand by ramming with tools especially adapted to that purpose, by watering or otherwise as directed.

- F. No payment will be given for sheeting, bracing, etc., during the progress of the work. No payment will be given for sheeting which has actually been left in the trench for the convenience of the Contractor.
- G. Sheeting driven below mid-diameter of any pipe shall remain in place from the driven elevation to at least 1-ft above the top of the pipe.

3.04 TEST PITS

- A. Excavation of test pits may be required for the purpose of locating underground utilities or structures as an aid in establishing the precise location of new work.
- B. Test pits shall be backfilled as soon as the desired information has been obtained. The backfilled surface shall be maintained in a satisfactory condition for travel until resurfaced as specified.

3.05 EXCAVATION BELOW GRADE AND REFILL

- A. Whatever the nature of unstable material encountered or the groundwater conditions, trench drainage shall be complete and effective.
- B. If the Contractor excavates below grade through error or for the Contractor's own convenience, or through failure to properly dewater the trench, or disturbs the sub grade before dewatering is sufficiently complete, he may be directed by the Engineer to excavate below grade as set forth in the following paragraph, in which case the work of excavating below grade and furnishing and placing the refill shall be performed at his own expense.
- C. If the material at the level of trench bottom consists of fine sand, sand and silt or soft earth which may work into the screened gravel notwithstanding effective drainage, the sub grade material shall be removed to the extent directed and the excavation refilled with a 6-in layer of coarse sand, or a mixture graded from coarse sand to the fine pea stone, as approved by the Engineer, to form a filter layer preserving the voids in the gravel bed of the pipe. The composition and gradation of gravel shall be approved by the Engineer prior to placement. Screened gravel shall then be placed in 6-in layers thoroughly compacted up to the normal grade of the pipe. If directed by the Engineer, bank run gravel shall be used for refill of excavation below grade.
- D. Geotextile filter fabric may be substituted for filter layer if approved by the Engineer. Filter fabric shall be Mirafi 140N; Supac equivalent, or equal.

3.06 BACKFILLING

- A. As soon as practicable after the pipe has been laid and jointed, backfilling shall begin and thereafter is prosecuted expeditiously. Bedding gravel, as specified for the type of pipe installed, shall be placed up to 1-ft over the pipe.
- B. An impervious dam or bulkhead cutoff of clay or other impervious material shall be constructed in the trench as directed, to interrupt the unnatural flow of groundwater after construction is completed. The dam shall be effectively keyed into the trench bottom and sidewalls. Provide at

least one clay or other impervious material dam in the pipe bedding between each manhole where directed or every 300-ft, whichever is less.

- C. Where the pipes are laid cross-country, the remainder of the trench shall be filled with common fill material in layers not to exceed 3-ft and mounded 6-in above the existing grade or as directed. Where a loam or gravel surface exists prior to cross-country excavations, it shall be removed, conserved and replaced to the full original depth as part of the work under the pipe items. In some areas it may be necessary to remove excess material during the clean-up process, so that the ground may be restored to its original level and condition.
- D. Where the pipes are laid in streets, the remainder of the trench up to a depth of 1-ft (20-in for State Highways) below the bottom of the specified permanent paving shall be backfilled with common fill material in layers not to exceed 1-ft (6-in for State Highways) and thoroughly compacted. The sub base layer for paving shall be of bank run gravel thoroughly compacted in 6-in layers.
- E. To prevent longitudinal movement of the pipe, dumping backfill material into the trench and then spreading will not be permitted until selected material or screened gravel has been placed and compacted to a level 1-ft over the pipe.
- F. Backfill shall be brought up evenly on all sides. Each layer of backfill material shall be thoroughly compacted by rolling, tamping, or vibrating with mechanical compacting equipment or hand tamping, to 92 percent compaction (to 95 percent compaction in State Highways). If rolling is employed, it shall be by use of a suitable roller or tractor, being careful to compact the fill throughout the full width of the trench. Rolling is the only accepted method in State Highways.
- G. Water jetting or puddling may be used unless the refill contains too great a proportion of clay or loam to permit satisfactory drying. Water jetting shall consist of using a suitable length of pipe at least 1-1/4-in in diameter fitted with quick acting valve and sufficient hose to connect to hydrant or pump having adequate pressure and capacity. The full depth of backfill shall be thoroughly inundated by thrusting the pipe into the fill at frequent intervals with the valve open until all slumping ceases. Where backfill is compacted by puddling, it shall be done by depositing in water. Water for jetting or puddling may be obtained from Owner hydrants wherever possible. Water may be furnished by the Owner from these hydrants if reasonable care is exercised in its use and when approved by the Water Department.
- H. If water restrictions are in force, obtain water elsewhere, or compact the backfill by other approved methods at no additional cost to this Contract.
- I. Where other methods are not practicable, compaction shall be by use of hand or pneumatic ramming with tools weighing at least 20 lbs. The material shall be spread and compacted in layers not greater than 6 inches thick. If necessary, sprinkling shall be employed in conjunction with rolling or ramming.
- J. Backfill around structures shall be selected common fill material, may be compacted by puddling where approved by the Engineer. All backfill shall be compacted, especially under and over pipes connected to the structures.

- K. Subject to the approval of the Engineer, fragments of ledge and boulders smaller than 6-in may be used in trench backfill providing that the quantity in the opinion of the Engineer is not excessive. Rock fragments shall not be placed until the pipe has at least 2-ft of earth cover. Small stones and rocks shall be placed in thin layers alternating with earth to ensure that all voids are completely filled. Fill shall not be dropped into the trench in a manner to endanger the pipe.
- L. Bituminous paving shall not be placed in backfilling unless specifically permitted, in which case it shall be broken up as directed. Frozen material shall not be used under any circumstances.
- M. All excavation within State roadways, or when directed by the Engineer, will be backfilled with Controlled Density Fill (CDF), Section 02230, after sand has been placed and compacted to a level 1-ft above the top of the pipe as shown in the Drawings. At no time will flowable fill be allowed to come in contact with the pipe. Trench will be filled to the level of initial pavement. Placement of flowable fill shall be by chute, pumping or other method approved by the Engineer. When placing flowable fill, proper height of application is required to prevent movement of the sand covering the ductile iron pipe. Formed walls or other bulkheads shall be constructed, if deemed necessary by the Engineer to control backfilling, to withstand hydrostatic pressure exerted by the flowable fill. Also necessary means to confine the material within a designated space shall be provided. The temperature for mixing and placing flowable fill must be at least 35 degrees F. or greater. Existing utilities contained in metal pipes located in the trench shall be covered with polyurethane wrap prior to backfilling with flowable fill. Existing utilities within the trench shall be braced to prevent floating. Any pipes or appurtenances made of metal shall be wrapped in polyurethane prior to backfilling trench with flowable fill.
- N. All road surfaces shall be broomed and hose cleaned immediately after backfilling. Dust control measures shall be employed at all times.

3.07 RESTORING TRENCH SURFACE

- A. Where the trench occurs adjacent to paved streets, in shoulders, sidewalks, or in cross-country areas, thoroughly consolidates the backfill and shall maintain the surface as the work progresses. If settlement takes place, immediately deposit additional fill to restore the level of the ground.
- B. In and adjacent to streets, the top 12-in layer (20-in in State Highways without CDF backfill) of trench backfill shall consist of compacted bank run gravel. Should the Contractor wish to use material excavated from the trench as gravel sub base for pavement replacement, the Contractor, at his/her own expense, have samples of the material tested by an independent testing laboratory at intervals not to exceed 500-ft, in order to establish its compliance with the specifications. Only material which has been tested and approved by the Engineer shall be allowed to be incorporated into the work.
- C. The surface of any driveway or any other area which is disturbed by the trench excavation and which is not a part of the paved road shall be restored to a condition at least equal to that existing before work began.
- D. In sections where the pipeline passes through grassed areas, and at the Contractor's own expense, remove and replace the sod, or loam and seed the surface to the satisfaction of the Engineer.
- E. CDF shall be used as backfill along all State Highways unless alternative methods of backfill and compaction are specifically approved and authorized by the state agencies responsible for the

roadways. Trenches backfilled with CDF shall be covered with plates (to allow traffic flow) after backfilling to allow 24-48 hours for material curing before final trench width pavement is placed. Final pavement shall be placed directly over the trenches filled with CDF after the material has cured.

3.08 PROTECTION

- A. Curbing and fencing in the vicinity of the Contractor's operations shall be adequately protected, and if necessary, removed and restored after backfilling. All curbing and fencing that are damaged during construction shall be replaced with material fully equal to that existing prior to construction.

END OF SECTION

SECTION 02230
GRANULAR MATERIALS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and obtain materials for filling and backfilling, grading and miscellaneous sitework, for the uses shown on the Drawings and as specified herein.

1.02 RELATED WORK

- A. Dewatering and Drainage is included in Section 02140.
- B. Rock and Boulder Excavation is included in Section 02213.
- C. Trenching, Backfilling and Compaction is included in Section 02221.
- D. Sedimentation and Erosion Control is included in Section 02270.
- E. Paving is included in Section 02576.

1.03 SUBMITTALS

- A. Submit to the Engineer, in accordance with Section 01300, complete product data for materials specified in this Section.

1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM C33 - Standard Specification for Concrete Aggregates.
 - 2. ASTM D476 - Standard Specification for Titanium Dioxide Pigments.
 - 3. ASTM D698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft (600kN-m/m)).
- B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

A. Laboratory Testing

1. At least 7 days prior to the placement of any backfill or fill materials, deliver a representative sample of the proposed materials weighing at least 50 lbs to the soils testing laboratory as required by the Owner.
2. Engage the soils testing laboratory to perform:
 - a. Grain size analyses of the samples to determine their suitability for use as backfill or fill material in conformance to the materials requirements specified herein.
 - b. The appropriate Proctor analyses to determine the maximum dry densities required for compaction testing as specified elsewhere in the Contract Documents.
3. Test results and determinations of suitability shall be delivered to the resident project representative no later than 3 days prior to the placement of backfill or fill materials.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Backfill and Fill materials shall be suitable excavated materials, natural or processed mineral soils obtained from off-site sources, or graded crushed stone or gravel. Backfill and Fill materials shall be free of all organic material, trash, [snow, ice, frozen soil,] or other objectionable materials which may be compressible or which cannot be properly compacted. Soft, wet, plastic soils which may be expansive, clay soils having a natural, in-place water content in excess of 30 percent, soils containing more than 5 percent (by weight) fibrous organic materials, and soils having a plasticity index greater than 30 shall be considered unsuitable for use as backfill and fill. Backfill and fill materials shall have a maximum of 1 percent expansion when testing is performed on a sample remolded to 95 percent of maximum dry density (per ASTM D698) at 2 percent below optimum moisture content under a 100 lbs/sq ft surcharge.
- B. Structural Fill shall be gravel, sandy gravel, or gravelly sand. Material shall have a plasticity index of less than 15 and shall conform to the following gradation limits:

<u>Sieve Size</u>	<u>Percent Finer By Weight</u>
6-in	100
No. 4	20 to 70
No. 40	5 to 35
No. 200	0 to 7

- C. Select Common Fill shall conform to the requirements of common fill except that the material shall not contain any materials larger than 2-in in largest dimension.
- D. Crushed Stone shall conform to Section M2.01.2 of the Massachusetts Department of Public Works Standard Specifications for Highways and Bridges, current edition, and all addenda and supplements thereto.

- E. Common Fill shall not contain granite blocks, broken concrete, masonry rubble, asphalt pavement, or any material larger than 6-in in any dimension. Common Fill shall have a plasticity index of less than 15 and shall conform to the following gradation limits:

<u>Sieve Size</u>	<u>Percent Finer By Weight</u>
No. 40	75
No. 200	20

- F. Bank-run gravel shall consist of hard, durable stone and coarse sand, essentially free from frost, frozen lumps, loam and clay, uniformly graded and containing no stone having any dimension greater than 3-in. The grading of sizes and material shall be such that the gravel may be thoroughly consolidated. The grading shall conform to the following requirements:

<u>Sieve</u>	<u>Percent Passing</u>
3/8-in.	70 Maximum
No. 10	50 Maximum
No. 200	5 Maximum

- G. Screened Gravel shall be hard, durable, rounded, or subangular particles of proper size and gradation, and shall be free from sand, loam, clay, excess fines, and other deleterious materials. Screened gravel shall be graded within the following limits:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
5/8-in	100
1/2-in	40 to 100
3/8-in	15 to 45
No. 10	0 to 5

- H. Sand for concrete, grout, and masonry shall conform to ASTM C33 for fine aggregate.

- I. Controlled Density Fill (CDF) used as backfill within State Highway Right-of-Way shall be comprised of a mixture of portland cement, fly ash, and water. Materials, methods of preparation, and placement techniques shall comply with the requirements of of Section 03300 as for concrete. Design mix shall result in a flowable material with a 28 day compressive strength of approximately 60 psi. Mix shall allow traffic use within 10 hours of installation. Recommended mix shall be as follows:

Portland Cement	50	lbs/cu yd
Coarse Aggregate	2175	lbs/cu yd
Water	500	lbs/cu yd, or as needed (Approximately 60 gallons.)

Portland cement shall be Type 1 and meet AASHTO M85. Fly ash shall meet AASHTO M-295 Class F and water shall meet M4.02.04.

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 02270

SEDIMENTATION AND EROSION CONTROL

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and perform all installation, maintenance, removal and area cleanup related to sedimentation control work as shown on the Drawings and as specified herein. The work shall include, but not necessarily be limited to; installation of temporary access ways and staging areas, silt fences or filter mitts, stone filter boxes, stone filter berms, sediment removal and disposal, device maintenance, removal of temporary devices, temporary mulching, excelsior matting installation and final cleanup.

1.02 RELATED WORK

- A. Earthwork is included in Section 02221.
- B. Granular fill materials are included in Section 02230.

1.03 SUBMITTALS

- A. Submit to the Engineer, in accordance with Section 01300, within 10 days after award of Contract, technical product literature for all commercial products to be used for sedimentation and erosion control.

1.04 QUALITY ASSURANCE

- A. Be responsible for the timely installation and maintenance of all sedimentation control devices necessary to prevent the movement of sediment from the construction site to off site areas or into the stream system via surface runoff or underground drainage systems. Measures in addition to those shown on the Drawings necessary to prevent the movement of sediment off site shall be installed, maintained, removed, and cleaned up at the expense of the Contractor. No additional charges to the Owner will be considered.
- B. Sedimentation and erosion control measures shall conform to the requirements outlined in the Conservation Commission Order of Conditions issued for this project.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Crushed stone for sediment filtration devices, access ways and staging areas shall conform to Mass DPW "Standards and Specifications for Highway and Bridges" Section M2.01.3.

B. Berm structural stone shall be rip-rap as follows:

1. Rip-rap shall be sound, durable rock which is roughly rectangular shape and of suitable quality to insure permanence in the condition in which it is to be used. Rounded stones, boulders, sandstone or similar soft stone will not be acceptable. Material shall be free from overburden, spoil, shale and organic material, meet the Engineer's approval and be well graded within the following limits:

<u>Weight of Stone</u>	<u>Percent Finer by Weight</u>
40 lb	100
12 lb	50
3 lb	0

C. Silt Fence

1. Steel posts shall be a minimum of 5-ft in length, 2-1/2-in by 2-1/2-in by 1/4-in angle post with self-fastening tabs and a 5-in by 4-in (nominal) steel anchor plate at bottom.
2. Welded wire fabric shall be 4-in by 4-in mesh of 12 gauge by 12 gauge steel wire.
3. Silt fence fabric shall be a woven, polypropylene, ultraviolet resistant material such as Mirafi 100X by Mirafi Inc., Charlotte, NC or equal.
4. Tie wires for securing silt fence fabric to wire mesh shall be light gauge metal clips (hog rings), or 1/32-in diameter soft aluminum wire.
5. Prefabricated commercial silt fence may be substituted for built-in-field fence. Pre-fabricated silt fence shall be "Envirofence" by Mirafi Inc., Charlotte, NC or equal.

D. 1/4-in woven wire mesh shall be galvanized steel or hardware cloth.

E. Straw mulch shall be utilized on all newly graded areas to protect areas against washouts and erosion. Straw mulch shall be comprised of threshed straw of oats, wheat, barley, or rye that is free from noxious weeds, mold or other objectionable material. The straw mulch shall contain at least 50 percent by weight of material to be 10-in or longer. Straw shall be in an air-dry condition and suitable for placement with blower equipment.

F. Latex acrylic copolymer, such as Soil Sealant with coalescing agent by Soil Stabilization Co., Merced, CA or equivalent shall be used as straw mulch tackifier.

G. An asphalt tackifier shall only be used when temperatures are too low to allow the use of a latex acrylic copolymer and only with prior written approval from the Engineer.

H. Excelsior matting blanket shall be installed in all seeded drainage swales and ditches as shown on the Drawings or as directed by the Engineer. Excelsior matting shall be AMXCO Curlex Blanket by American Excelsior Company, Arlington, TX or equal.

PART 3 EXECUTION

3.01 INSTALLATION

A. Silt Fence Installation

1. Silt fences shall be positioned as indicated on the Drawings and as necessary to prevent off site movement of sediment produced by construction activities as directed by the Engineer.
2. Dig trench approximately 6-in wide and 6-in deep along proposed fence lines.
3. Drive metal-stakes, 8-ft on center (maximum) at back edge of trenches. Stakes shall be driven 2-ft (minimum) into ground.
4. Hang 4 by 4 woven wire mesh on posts, setting bottom of wire in bottom of trench. Secure wire to posts with self-fastening tabs.
5. Hang filter fabric on wire carrying to bottom of trench with about 4-in of fabric laid across bottom of trench. Stretch fabric fairly taut along fence length and secure with tie wires 12-in on center both ways.
6. Backfill trench with excavated material and tamp.
7. Install pre-fabricated silt fence according to manufacturer's instructions.

- #### B. Construct filter boxes as detailed on the Drawings, from 1/4-in woven wire mesh or hardware cloth and wood. Fill with crushed stone and place over all drop inlets and manholes to storm drain system as each inlet is completed. This should be done prior to setting casting, if there is a delay between installation of inlet structures or drain manholes and setting of castings. An alternate method is to ring each inlet with a silt fence.

C. Stone Filter Berm Installation

1. Place berm structural stone across channel just below lower sandbag wall at work area. Face upstream side of structural berm with crushed stone.

- #### D. Staging areas and access ways shall be surfaced with a minimum depth of 4-in of crushed stone.

3.02 MAINTENANCE AND INSPECTIONS

A. Inspections

1. Make a visual inspection of all sedimentation control devices once per week and promptly after every rainstorm. If such inspection reveals that additional measures are needed to prevent movement of sediment to offsite areas or into the vent trench, promptly install additional devices as needed. Sediment controls in need of maintenance shall be repaired promptly.

B. Device Maintenance

1. Silt Fences

- a. Remove accumulated sediment once it builds up to 1/2 of the height of the fabric.
- b. Replace damaged fabric, or patch with a 2-ft minimum overlap.
- c. Make other repairs as necessary to ensure that the fence is filtering all runoff directed to the fence.

2. Filter Boxes

- a. Replace crushed stone when it becomes saturated with silt.

3. Stone Filter Berm

- a. Muck out trapped silt from dewatering operations when it has built up to within 6-in of the top of the berm.
- b. Replace crushed stone filter when saturated with silt.

4. Add crushed stone to access ways and staging area as necessary to maintain a firm surface free of ruts and mudholes.

3.03 TEMPORARY MULCHING

- A. Apply temporary mulch to areas where rough grading has been completed but final grading is not anticipated to begin within 30 days of the completion of rough grading.
- B. Straw mulch shall be applied at rate of 100 lbs/1000 sq ft and tackified with latex acrylic copolymer at a rate of 1 gal/1000 sq ft diluted in a ratio of 30 parts water to 1 part latex acrylic copolymer mix.

3.04 EXCELSIOR MATTING

- A. Excelsior matting blankets shall be installed in all seeded drainage swales and ditches as shown on the Drawings and as directed by the Engineer in accordance with manufacturer's instructions. The area to be covered shall be properly prepared, fertilized and seeded with permanent vegetation before the blanket is applied. When the blanket is unrolled, the netting shall be on top and the fibers in contact with the soil over the entire area. The blankets shall be applied in the direction of water flow and stapled. Blankets shall be placed a minimum of three rows (of 4-ft) wide (total approx. 12-ft width) within the drainage swale/ditch and stapled together in accordance with manufacturer's instructions. Side overlaps shall be 4-in minimum. The staples shall be made of wire, .091-in in diameter or greater, "U" shaped with legs 10-in in length and a 1-1/2-in crown. The staples shall be driven vertically into the ground, spaced approximately two linear feet apart, on each side, and one row in the center alternately spaced between each size. Upper and lower ends of the matting shall be buried to a depth of 4-in in a trench. Erosion stops shall be created every 25-ft by making a fold in the fabric and carrying the fold into a silt trench across the full width of the blanket. The bottom of the fold shall be 4-in below the ground surface. Staple on both sides of fold. Where the matting must be cut or more than one

roll length is required in the swale, turn down upper end of downstream roll into a slit trench to a depth of 4-in. Overlap lower end of upstream roll 4-in past edge of downstream roll and staple.

1. To ensure full contact with soil surface, roll matting with a roller weighing 100 lbs/ft of width perpendicular to flow direction after seeding, placing matting and stapling. Thoroughly inspect channel after completion. Correct any areas where matting does not present a smooth surface in full contact with the soil below.

3.05 REMOVAL AND FINAL CLEANUP

- A. Once the site has been fully stabilized against erosion, remove sediment control devices and all accumulated silt. Dispose of silt and waste materials in proper manner. Regrade all areas disturbed during this process and stabilize against erosion with surfacing materials as indicated on the Drawings.

END OF SECTION

SECTION 02516

CONNECTIONS TO EXISTING WATER MAINS

PART 1 - GENERAL

1.01 WORK INCLUDED:

- A. This section covers connections to existing water mains, complete.
- B. The Contractor shall furnish all pipe, fittings, valves, tapping machines, if required, and appurtenances. The Contractor shall do all excavation and backfill as required.

1.02 RELATED WORK:

- A. Section 02080, DUCTILE IRON PIPE AND FITTINGS.
- B. Section 02514, HYDRANTS AND VALVES.
- C. Section 03302, FIELD CONCRETE.

PART 2 - PRODUCTS: NOT APPLICABLE

PART 3 - EXECUTION

3.01 CONTRACTOR OPERATIONS:

- A. The Contractor shall make all connections to the existing mains as indicated on the drawings and as herein specified.
- B. The Contractor shall develop a program for the construction and putting into service of the new work subject to the approval of the Engineer. All work involving cutting into and connecting to the existing work shall be planned so as to interfere with operation of the existing facilities for the shortest possible time and when the demands on the system best permit such interference even to the extent of working outside of normal working hours to meet these requirements.
- C. The Contractor shall have all possible preparatory work done prior to making the connection and shall provide all labor, tools, material, and equipment required to do the work in one continuous operation.
- D. The Contractor shall have no claim for additional compensation, by reason of delay or inconvenience, for adapting his operations to the needs of the Owner's water supply. No damages shall be claimed by the Contractor for delays in dewatering pipelines nor shall any damages be claimed because of water leaking through closed valves after dewatering is completed.

- E. Under no circumstances shall any customers be without water for a period of more than 4 hours without prior approval of the Owner. Should it appear that any customer will be without water for more than 4 hours, the Contractor shall install temporary water service where required by the Engineer.
- F. Existing pipeline that is not to be abandoned but is damaged by the Contractor during the work shall be replaced by him at his own expense in a manner approved by the Engineer.

3.02 TAPPING CONNECTION TO EXISTING MAINS:

- A. Tapping connections to the existing mains, where indicated on the drawings, shall be made with service pressure in the main, using tapping sleeves and valves and a suitable tapping machine.
- B. Other connections to existing mains shall be made with the main out of service, unless otherwise required by the Engineer. Such connections will not require tapping sleeves and valves but connections as indicated on the drawings.

END OF SECTION

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SECTION 02576

PAVEMENT REPAIR AND RESURFACING

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, material, equipment and incidentals required and replace all pavement removed over trenches or otherwise disturbed by the Contractor's operations.
- B. New pavement in city streets shall consist of initial (temporary) pavement over trenches and other excavations and final bituminous concrete pavement placed either over trenches and other excavations as directed by the Owner. All edges of final bituminous trench pavement shall be heat treated using infrared treatment.
- C. New pavement in the State Highways (MDC and MHD) shall consist of permanent trench width bituminous concrete pavement and infrared treatment over trenches backfilled with CDF, to the limits shown on the Drawings. All pavement repair and resurfacing shall be in accordance with the requirements of the Mass. Highway Department permits.
- D. Streets, driveways, parking areas or sidewalk pavements damaged or disturbed by the Contractor's operations shall be repaired, replaced or restored in accordance with the requirements specified herein and as directed for the respective type of pavement replacement and in a manner satisfactory to the Owner.

1.02 RELATED WORK

- A. Trimming edges of existing pavement is included in Section 02221.

1.03 REFERENCE STANDARDS

- A. Except as otherwise specified herein, the current Standard Specifications for Highways and Bridges, including all addenda, issued by the Commonwealth of Massachusetts, Department of Public Works, shall apply to materials and workmanship required for the work of this Section.
- B. American Association of State Highways and Transportation Officials (AASHTO)
 - 1. AASHTO M144 - Standard Specification for Calcium Chloride.
- C. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 MAINTENANCE

- A. All pavement placed shall be maintained for a period of 1 year. During this period all areas which have settled or are unsatisfactory for traffic shall be refilled and replaced at Contractor's expense.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Calcium chloride shall conform to AASHTO M144, Type I or Type II.
- B. Initial (temporary) trench width pavement shall be Binder Course, conforming to the referenced standard, Section M3.11, Class I, Type I-1 bituminous concrete.
- C. Final trench pavement shall consist of Binder Course and Top Course, conforming to the referenced standard, Section M3.11, Class I, bituminous concrete.

PART 3 EXECUTION

3.01 GENERAL

- A. Materials for pavement shall be mixed, delivered, placed and compacted in accordance with the referenced standard, Sections M3.11 and 460 and as specified herein.
- B. Whenever the sub base becomes dry enough to cause dust problems, spread calcium chloride uniformly over the gravel surface in sufficient quantity to eliminate the dust.
- C. When the air temperature falls below 50 degrees F, extra precautions shall be taken in drying the aggregates, controlling the temperatures of the materials and placing and compacting the mixtures.
- D. No mixtures shall be placed when the air temperature is below 40 degrees F, nor when the material on which the mixtures are to be placed contains frost or has a surface temperature not suitable to the Engineer.
- E. No vehicular traffic or loads shall be permitted on the newly completed pavement until adequate stability has been attained and the material has cooled sufficiently to prevent distortion or loss of fines. If the climatic or other conditions warrant it, the period of time before opening to traffic may be extended at the discretion of the Engineer.

3.02 INITIAL TRENCH WIDTH PAVEMENT

- A. Temporary pavement shall be placed wherever existing pavement has been removed or disturbed as soon as practical, but in no case more than two days after backfilling is completed.
 - 1. The bank run gravel sub base shall be excavated to a depth of 2-in below the existing pavement, shaped and compacted.
 - 2. The 2-in initial pavement shall be placed and compacted by steel-wheeled rollers of sufficient weight to thoroughly compact the bituminous concrete without damaging the existing pavement. The new pavement shall be rolled smooth and even with the existing pavement.
 - 3. Hose clean all road surfaces adjacent to the trench area to be paved. No paving is to be placed until subsurface is dry.

4. Initial pavement shall be maintained in a condition suitable for traffic until replaced or overlaid by final pavement. Defects shall be repaired within 3 days of notification of such defects.

3.03 PERMANENT TRENCH WIDTH PAVEMENT

- A. Raise all manhole and catch basin frames, gate valve and curb stop boxes, gas drips and valves, and any other pavement penetrations to finished elevation of the new trench width pavement. All raised appurtenances shall be grouted with concrete or otherwise as approved by the Engineer to firmly support them flush with the surface of the new trench width pavement.
- B. Permanent trench width pavement in State Highways with CDF shall not be placed over trenches until water main is in service and part of the water distribution system, unless otherwise directed in writing by the Engineer and shall be constructed as follows:
 1. Cut out existing pavement using pavement saw or other approved method. The pavement removed shall extend 1-ft outside the trench on each side as shown in the Drawings. Edges of the pavement shall be straight and sound. Broom and tack coat all edges with emulsified or cutback asphalt.
 2. Place binder course over concrete slab and compact to appropriate thickness by steel-wheeled roller. The appropriate thickness in State roadways is 1-1/2-inches.
 3. Broom and tack coat edges of existing pavement and Binder Course with emulsified or cutback asphalt.
 4. Place Top Course and infrared treat to appropriate thickness, finish smooth, dense and flush with surface of existing pavement. The appropriate thickness in State roadways is 1-1/2-inches.
- C. Final pavement in city streets shall not be placed over trenches in less than 90 days after completion of the backfilling unless otherwise directed in writing by the Engineer.
 1. Final pavement over trenches shall be constructed as follows:
 - a. Remove initial pavement and sub base to 3-in below existing pavement. Shape and compact sub base to 92 percent of maximum dry density as determined by ASTM D1557, Method D.
 - b. Trim loose edges of existing pavement. Broom and tack coat all edges with emulsified or cutback asphalt.
 - c. Place Binder Course and compact to 1-1/2-in. thickness by steel-wheeled roller.
 - d. Broom and tack coat edges of existing pavement and Binder Course with emulsified or cutback asphalt.
 - e. Place Top Course and compact to 1-1/2-in. thickness, finish smooth, dense and flush with surface of existing pavement. .
- D. All pavement seams shall be infrared treated as follows:

- a. Areas to be repaired shall be swept clean to remove all loose and foreign materials.
- b. An approved infrared heater not to exceed 15,000 BTU's per square foot per hour shall be positioned over the area to be repaired for a period of time required to soften the existing pavement to a depth of two or more inches. Oxidation of the pavement, caused by excessive heat as determined by the Engineer, shall be avoided. The Contractor shall remove all unsuitable material in the event of oxidation and replace same with new bituminous concrete at his own expense.
- c. A recycling proprietary in the amount approved by the Engineer shall be added to the softened area after scarification and shall be raked to a workable condition.
- d. Any necessary additional bituminous concrete mix must be obtained from a suitable infrared heated storage unit required to keep asphalt at near constant temperature throughout the working day. Under no circumstances is any asphalt mix to be used that registers a temperature of under 200 deg. F.
- e. After the paving mixture has been properly admixed and raked to grade, compaction shall be obtained by use of a steel wheeled roller of sufficient weight to establish a uniform density comparable to that of adjacent surface within the work area. Finished patch shall be level with no depression retaining water on any of its surface.
- f. Edges of the finished area shall be sealed with a suitable asphalt emulsion RS-1 or equal, conforming to AASHTO-M140 conforming to AASHTO-M208, around the perimeter of the newly repaired area.
- g. A cationic asphalt emulsion sealant, conforming to AASHTO-M208, shall then be hand sprayed on the patched area and adjacent edges at the rate of approximately one tenth (0.1) gallon per square yard to seal the entirely newly treated area. Sand will be spread over the newly sealed area.

3.04 EXISTING CURBING AND ISLANDS

- A. Existing concrete, bituminous, timber, or granite curbing and/or islands shall be protected. If necessary, curbing shall be removed and replaced after backfilling. Curbing and islands which are damaged during construction shall be replaced with curbing and islands of equal quality and dimension at the Contractor's expense. Granite curbing removed and reset shall conform to Section 580 of the Massachusetts DPW Specifications. Joints between sections shall be pointed as required after resetting.

3.05 PAVEMENT MARKINGS

- A. Reline all streets with pavement markings equal in type and location where existing prior to paving.
- B. Pavement markings shall be painted within 10 days of installation of final pavement as directed by Engineer.

END OF SECTION

SECTION 02616

DUCTILE IRON PIPE AND FITTINGS INSTALLATION

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, tools, equipment, materials and incidentals required to install, disinfect and test ductile iron pipe and fittings as shown on applicable project drawings and as specified herein.
- B. Piping shall be located substantially as shown on the Drawings. The Engineer reserves the right to make such modifications in locations as may be found desirable to avoid interference between pipes or for other reasons. Pipe fitting notation is for the Contractor's convenience and does not relieve him/her from installing and jointing different or additional items where required to achieve a complete piping system.
- C. Where the word "pipe" is used it shall refer to pipe, fittings, or appurtenances unless otherwise noted.
- D. The Contractor shall furnish and install the ductile iron pipe (minimum Class 52 push-on joint pipe), including; gaskets, mechanical joint retainer glands and fittings (for restrained joint pipe), gaskets, and fittings (coupling, tees, bends, reducers, etc.) as required for this work.

1.02 RELATED WORK

- A. Trenching, Backfilling and Compaction is included in Section 02221.
- B. Granular Fill Material is included in Section 02230.
- C. Sedimentation and Erosion Control is included in Section 02270.
- D. Pavement Repair and Resurfacing is included in Section 02576.
- E. Valves and Appurtenances are included in Section 02640.

1.03 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM A193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.
 - 2. ASTM A194 - Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service.
 - 3. ASTM C150 - Standard Specification for Portland Cement.

B. American Water Works Association (AWWA)

1. AWWA C104 - Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
2. AWWA C105 - Polyethylene Encasement for Ductile-Iron Pipe Systems.
3. AWWA C110 - Ductile-Iron and Gray-Iron Fittings, 3-In Through 48-In (75mm Through 1200mm) for Water and Other Liquids.
4. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
5. AWWA C150 - Thickness Design of Ductile-Iron Pipe.
6. AWWA C151 - Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids.
7. AWWA C153 - Ductile- Iron Compact Fittings, 3-In Through 16-In (76 mm Through 610 mm), for Water and Other Liquids.
8. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
9. AWWA C651 - Disinfecting Water Mains.

- D. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Care shall be taken in loading, transporting, and unloading to prevent injury to the pipe. Under no circumstances shall the pipe be dropped or skidded against each other. Slings, hooks, or pipe tongs shall be used in pipe handling.
- B. Materials, if stored, shall be kept safe from damage. The interior of all pipe, fittings and other appurtenances shall be kept free from dirt or foreign matter at all times.
- C. Pipe shall not be stacked higher than the limits recommended by its manufacturer. The bottom tier shall be kept off the ground on timbers, rails, or concrete. Stacking shall conform to manufacturer's recommendations.
- D. Gaskets for mechanical and push-on joints to be stored shall be placed in a cool location out of direct sunlight. Gaskets shall not come in contact with petroleum products. Gaskets shall be used on a first-in, first-out basis.

PART 2 PRODUCTS

2.01 MATERIALS

A. Pipe

- I. Ductile iron pipe shall conform to AWWA C 151. Pipe shall be supplied in standard lengths.
2. Thickness design shall be per AWWA C 150, except provide minimum Class 52.

3. Ductile iron pipe for gravity sewer shall conform to ASTM A746 standards.
4. Ductile iron pipe shall be by U.S. Pipe and Foundry Company, Inc.; American Cast Iron Pipe Company; Griffin Pipe Products Company or equal.

B. Joints

- I. Ductile iron pipe shall have rubber-gasket push-on joint or rubber-gasket mechanical joint. Rubber-gasket joints shall conform to AWWA C111. Gasket shall be of SBR.
2. All hydrant piping shall be provided with restrained joints. Restrained joints shall be “Locked-type” joints manufactured by the pipe and fitting manufacturer that utilize restraint independent of the joint gasket. Restrained joints shall be suitable for the specified 150 psig test pressure. Mechanical joint retainer glands as manufactured by EBAA Iron Inc. of Texas can be selected for restraining the mechanical joint of ductile iron pipe. Push-on restrained joints as manufactured by the pipe supplier or manufacturer may be used subject to the Engineer’s approval.
3. Sleeve type couplings shall be Dresser Style 38 or 138, Smith-Blair Type 411, Ford Style FC4 or equal.

C. Fittings

1. Pipe fittings shall be ductile iron with pressure rating of 350 psi. Fittings shall meet the requirements of AWWA C 110 or AWWA C 153 as applicable. Fittings shall have the same pressure rating, as a minimum, of the connecting pipe.
2. Closures shall be made with mechanical joint ductile iron solid sleeves and shall be located in straight runs of pipe at minimum cover outside the limits of restrained joint sections. Location of closures shall be subject to approval of the Engineer.

D. Interior Lining

Ductile iron pipe and fittings shall have a cement mortar lining and asphaltic seal coat in accordance with AWWA C104 double thickness.

E. Exterior Corrosion Protection

- I. Ductile iron pipe and fittings shall have a bituminous exterior coating in accordance with AWWA C150.
2. Buried sleeve-type couplings shall have a protective wrapping of “Denso” material by DENSO Inc. of Texas or equal. Where “Denso” material is used, the joint shall be packed up with “Densyl mastic” to give an even contour for wrapping with “Densopol” tape. A 1.5 mm thick coating of “Denso” paste shall be applied following by 100 mm or more wide “Densopol” tape wound spirally round the joint with at least 50 percent overlap.

2.02 DUCTILE IRON PIPE DESIGN

- A. Ductile iron pipe shall have a minimum tensile strength of 60,000 psi with a minimum yield strength of 42,000 psi. Design shall be done for external and internal pressures separately using the larger of the two for the net design thickness. Additional allowances shall be made for service allowance and casting tolerance per AWWA C 150. The pipe classes determined for various sizes and conditions shall provide the total calculated thickness at a minimum or conform to minimum pipe class specified in Paragraph 2.OIA2 above, whichever is greater.
- B. Design for the net thickness for external loading shall be taken as the greater of the following conditions:
 - 1. 2-1/2-ft of cover with AASHTO H-20 wheel loads, with an impact factor of 1.5.
 - 2. Depth from existing ground level of future proposed grade (whichever is greater) to top of pipe as shown on the Drawings, with truck load.
 - 3. Soil Density: 130 lbs/cu ft .
 - 4. Laying Conditions; AWWA C 150, Type 5.
- C. Design for the net thickness shall be based upon the following internal pressure conditions:
 - I. Design pressure: 150 psi
 - 2. Surge allowance: 100 psi
 - 3. Safety factor: 2
 - 4. Total internal pressure design: $2(150 + 100) = 500$ psi
 - 5. E': 300 psi
 - 6. Yield strength: 42,000 psi

PART 3 EXECUTION

3.01 GENERAL

- A. Care shall be taken in loading, transporting and unloading to prevent injury to the pipe or coatings. Pipe and fittings shall not be dropped. All pipe and fittings shall be examined before laying and no piece shall be installed which is found to be defective. Damage to the pipe coatings shall be repaired per manufacturer's recommendations.
- B. If any defective pipe is discovered after it has been laid, it shall be removed and replaced with a sound pipe in a satisfactory manner. All pipe and fittings shall be thoroughly cleaned before laying, shall be kept clean until they are used in the work and when installed or laid, shall conform to the lines and grades required.

3.02 INSTALLING DUCTILE IRON PIPE AND FITTINGS

- A. Ductile iron pipe and fittings shall be installed in accordance with requirements of AWWA C600, except as otherwise specified herein. A firm, even bearing throughout the length of the pipe shall be provided by digging bell holes at each joint and by tamping backfill materials at the side of the pipe to the springline per details shown on the Drawings. Blocking will not be permitted.
- B. All pipe shall be sound and clean before laying. When laying is not in progress, open ends of the pipe shall be closed by a watertight plug or other approved means. Sufficient backfill shall be placed to prevent flotation. The deflection at joints shall not exceed 75 percent of allowable deflection recommended by manufacturer.
- C. All ductile iron pipe laid underground shall have a minimum of 3-ft of cover unless otherwise shown on the Drawings or as specified herein. Pipe shall be laid such that the invert elevations shown on the Drawings are not exceeded.
- D. Fittings, in addition to those shown on the Drawings shall be provided, where required, in crossing utilities which may be encountered upon opening the trench. Solid sleeve closures shall be installed at locations approved by the Engineer.
- E. The pipe interior shall be maintained dry and broom clean throughout the construction period.
- F. When cutting pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe. Cut ends of pipe to be used with a bell shall be beveled to conform to the manufactured spigot end. Cement lining shall be undamaged. Field cut ends shall be sealed with Protecto 401 (or for potable water, approved epoxy) in accordance with manufacturer's instructions. Cutting of restrained joint pipe will not be allowed, unless approved at specific joints in conjunction with the use of restrainer glands by EBAA Iron or field adaptable restrained joints.
- G. Jointing Ductile-Iron Pipe
 - 1. Push-on joints shall be made in strict accordance with manufacturer's instructions and AWWA C600. Pipe shall be laid with bell ends looking ahead. A rubber gasket shall be inserted in the groove of the bell end of the pipe. The joint surfaces shall be cleaned and lubricated and the plain end of the pipe shall be aligned with the bell of the pipe to which it is to be joined and pushed home.
 - 2. Mechanical joints shall be assembled in strict accordance with the manufacturer's instructions and AWWA C600. Pipe shall be laid with bell ends looking ahead. To assemble the joints in the field, thoroughly clean and lubricate the joint surfaces and rubber gasket. Bolts shall be tightened to the specified torques. Under no condition shall extension wrenches or pipe over handle of ordinary ratchet wrench be used to secure greater leverage.
 - 3. Bolts in mechanical or restrained joints shall be tightened alternately and evenly.
 - 4. Restrained joints shall be installed according to pipe manufacturer's instructions.

- H. Concrete thrust blocks shall be installed as shown on the Drawings or as directed by the Owner. Minimum bearing area shall be as shown on the Drawings or attached schedules. Joints shall be protected by felt roofing paper prior to placing concrete. Concrete shall be placed against undisturbed material, and shall not cover joints, bolts, or nuts, or interfere with the removal of any joint. Wooden side forms or sand bags shall be provided for forming thrust blocks.
- I. All blow-offs, outlets, valves, fittings, couplings and other appurtenances required shall be set and jointed as indicated on the Drawings in accordance with the manufacturer's instructions.

3.03 TESTING

- A. After installation, the pipe shall be tested for compliance as specified herein. Furnish all necessary equipment and labor for the pressure test and leakage test on the pipelines.
- B. Submit detailed test procedures and method for Engineer's review. In general, testing shall be conducted in accordance with AWWA C600.
- C. Pressure pipelines shall be subjected to a hydrostatic pressure of or 1.5 times the working pressure at the highest point along the test segment. This test pressure shall be maintained for a minimum of 2 hours. The leakage rate shall not exceed those indicated in AWWA C600. Provide suitable restrained bulkheads as required to complete the hydrostatic testing specified.
- D. Make all taps and furnish all necessary caps, plugs, etc. as required in conjunction with testing a portion of the pipe between valves. Furnish a test pump, gauges, and any other equipment required in conjunction with carrying out the hydrostatic tests.
- E. All valves and valve boxes shall be properly located and installed and operable prior to testing. Bulkheads shall be provided with a sufficient number of outlets for filling and draining the line and for venting air.
- F. Hydrostatic pressure and leakage tests shall conform with Section 4 of AWWA C600. Furnish gauges, meters, pressure pumps and other equipment needed to fill the line slowly and perform the required hydrostatic pressure leakage tests.
- G. The Owner will provide a source of supply from the existing treated water distribution system for Contractor's use in filling the lines. An air break shall be maintained at all times between the Owner's distribution system and the Contractor's equipment to prevent cross-connection. The line shall be slowly filled with water and the specified test pressure shall be maintained in the pipe for the entire test period by means of a pump furnished by the Contractor. Provide accurate means for measuring the quantity of water required to maintain this pressure. The amount of water required is a measure of the leakage.
- H. Duration of pressure test shall not be less than 2 hours. The leakage test shall be a separate test following the pressure test and shall not be less than 2 hours duration. All leaks evident at the surface shall be repaired and leakage eliminated regardless of the total leakage as shown by test. Lines which fail to meet tests shall be repaired and retested as necessary until test requirements are complied with. Defective materials, pipes, valves and accessories shall be removed and replaced.

- I. The Owner shall supply, at no cost to the Contractor, a maximum quantity of water equal to 110 percent of the volume of the pipelines for testing. Additional water required by the Contractor will be provided at standard billing rates for the volume required.
- J. Submit plan for testing to the Engineer for review at least 10 days before starting the test.

3.04 CLEANING

- A. At the conclusion of the work, thoroughly clean all of the pipe by flushing with water or other means to remove all dirt, stones, pieces of wood, or other material which may have entered during the construction period. All debris shall be removed from the pipeline. The lowest segment outlet shall be flushed last to assure debris removal

3.05 DISINFECTION

- A. Ductile iron pipe used for potable water service shall be disinfected after cleaning. Provide all necessary equipment and labor for the disinfection.
- B. Disinfection shall be in accordance with AWWA C651 standard.
- C. Discharge of chlorinated water shall comply with all Federal, State and local standards. Provide sodium bisulfite for dechlorination prior to discharge.
- D. The location of the chlorination and sampling points will be determined by the Engineer in the field. Taps for chlorination and sampling shall be installed by the Contractor. The Contractor shall uncover and backfill the taps as required.
- E. The general procedure for chlorination shall be first to flush all dirty or discolored water from the lines and then introduce chlorine in approved dosages through a tap at one end, while water is being withdrawn at the other end of the line. The chlorine solution shall remain in the pipeline for 24 hours.
- F. Following the chlorination period, all treated water shall be flushed from the lines at their extremities and replaced with water from the distribution system. Bacteriological sampling and analysis of the replacement water may then be made by the Engineer in full accordance with AWWA C651. The Contractor will be required to rechlorinate, if necessary and the line shall not be placed in service until the requirements of the State Public Health Department are met.
- G. Special disinfecting procedures shall be used in connections to existing mains and where the method outlined above is not practical.

END OF SECTION

EXHIBIT A
Use as a reference

LININGS AVAILABLE FOR DUCTILE IRON PIPE

Description	Max. Service (1) Temp.(Degrees F)	Common Uses	Thickness
CEMENT MORTAR.		Drinking Water	Standard per AWWA C104 or double
With Sealcoat	150 degrees	Salt Water	
Without Sealcoat	212 degrees	Non-Septic Gravity Sewers Sanitary Sewer Force Mains	
GLASS.		Scum	10 Mil (nominal)
PETROLEUM ASPHALT COATING	150 degrees	Air	1 Mil
PROTECTO 401 (CERAMIC-FILLED AMINE-CURED EPOXY)	120-150 degrees (2)	Septic Sewers Acids(3) Alkali Waste Pickling Brine	40 Mil (nominal)
EPOXIES SUITABLE FOR DRINKING WATER(4)	120-150 degrees (2)	Drinking Water Food Processing	24 Mil (minimum)
POLYETHYLENE	120-150 Degrees (5)	Septic Sewers Acids(3) Alkali Waste Pickling Brine	40 Mil (nominal)

- (1) Maximum service temperatures listed are intended as general guidelines. For higher service temperatures, consult manufacturer for specific recommendations.
- (2) Maximum service temperature for epoxies depends on service conditions and specific formulation. Consult manufacturer for recommendations for elevated temperature service.
- (3) Consult manufacturer for specific acid service use.
- (4) All epoxies are not suitable for conveying drinking water. Consult manufacturer for recommendations.
- (5) Maximum service temperature for polyethylene for acids and alkali waste depends on the specific acid or alkali waste and service condition(s). Consult manufacturer for recommendations for elevated temperature service.

EXHIBIT B
Use as a Reference

**GASKET MATERIALS USED FOR DUCTILE IRON PIPE
IN WATER AND SEWERAGE SERVICE**

Description	Maximum Service (1,2) Temperature (Degrees F)		Common Uses(3)
	Push-On Gaskets	Mechanical Joint Gaskets	
SBR (Styrene Butadiene)	150 Degrees	120 Degrees	Fresh Water Salt Water Sanitary Sewage
EPDM (Ethylene Propylene)	250 Degrees	225 Degrees	Fresh Water Salt Water Sanitary Sewage Hot Water
Nitrile (NBR) (Acrylonitrile Butadiene)	150 Degrees	120 Degrees Fats, Oils Greases Chemicals	Hydrocarbons
Neoprene(R) (CR) (Polychloroprene)	200 Degrees	200 Degrees Salt Water Sanitary Sewage	Fresh Water
Viton(R); Fluorel(R) (FPM) (4) (Fluorocarbon)	300 Degrees	225 Degrees Acids Petroleum Vegetable Oils	Hydrocarbons

- (1) Maximum service temperatures listed are intended as general guidelines for ductile iron pipe gaskets. For service temperatures greater than those listed, consult manufacturers for specific recommendations.
- (2) Minimum service temperature is not usually a meaningful parameter for piping gaskets; however, low temperatures during pipeline installation may necessitate precautions. Consult manufacturer for pertinent recommendations.
- (3) Water, including sanitary sewage, with low levels of the listed contaminants.

SECTION 02640

VALVES, HYDRANTS AND APPURTENANCES

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, tools, equipment and incidentals required to install all buried valves, valves in manholes and underground vaults, hydrants and appurtenances complete with actuators and all accessories as shown on the Drawings and as specified herein.
- B. Valves specifically excluded from this Section are as follows:
 - 1. All interior valves in building.
 - 2. All valves for plumbing work.
 - 3. All valves for heating and ventilation work.
 - 4. All valves specifically included with equipment.

1.02 RELATED WORK

- A. Earthwork is included in Section 02200.
- B. Ductile iron pipe and fittings are included in Section 02616.

1.03 SUBMITTALS

- A. Submit, in accordance with Section 01300, materials required to establish compliance with this Section for shop drawings. Submittals shall include the following:
 - 1. Manufacturer's literature, illustrations, specifications and engineering data including:
 - a. Dimensions.
 - b. Size.
 - c. Materials of construction.
 - d. Weight.
 - e. Protection coating.
 - f. Actuator weight.
 - g. Calculations for actuator torque where applicable.

B. Test Reports

1. Four copies of all certified shop test results specified herein.

C. Operation and Maintenance Manuals

1. Submit complete operation and maintenance manuals including copies of all approved Shop Drawings.

D. Certificates

1. Certificates of compliance where required by referenced standards: For each valve specified to be manufactured and/or installed in accordance with AWWA and other standards, submit an affidavit of compliance with the appropriate standards, including certified results of required tests and certification of proper installation.

1.04 REFERENCE STANDARDS

- A. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

B. American Water Works Association (AWWA)

1. AWWA C111 - Rubber-Gasket Joints for Ductile-Iron and Pressure Pipe and Fittings.
2. AWWA C500 - Metal-Seated Gate Valves, for Water Supply Service.
3. AWWA C502 - Dry-Barrel Fire Hydrants.
4. AWWA C504 - Rubber-Seated Butterfly Valves.
5. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service.

C. American National Standards Institute (ANSI)

1. ANSI B16.1 – Cast Iron Pipe Flanges and Flanged Fittings.

D. American Society for Testing and Materials (ASTM)

1. ASTM A48 - Standard Specification for Gray Iron Castings.
2. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings
3. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
4. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes.
5. ASTM A536 - Standard Specification for Ductile Iron Castings.

- E. The Society for Protective Coatings (SSPC)
 - 1. SSPC SP-6 - Joint Surface Standard Commercial Blast Cleaning
- F. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 QUALITY ASSURANCE

A. Manufacturer's Qualifications

- 1. Valves and appurtenances provided under this Section shall be the standard product in regular production by manufacturers whose products have proven reliable in similar service for at least 5 years. If required, the manufacturer shall furnish evidence of installation in satisfactory operation.
- 2. All units of the same type shall be the product of one manufacturer.

B. Design Criteria

- 1. All valves and appurtenances shall be new and in perfect working condition. Valves shall be designed for continuous use with a minimum of maintenance and service required and shall perform the required function without exceeding the safe limits for stress, strain or vibration. In no case will used or damaged valves be acceptable. The selection of equipment to meet the specified design conditions is the responsibility of the Contractor. Both workmanship and material shall be of the very best quality and shall be entirely suitable for the service conditions specified.

C. Source Quality Control

- 1. Valves shall be shop tested in accordance with the following:
 - a. Gate valves: AWWA C500.
 - b. Rubber-seated butterfly valves: AWWA C504.
- 2. Obtain each type of valve from no more than one manufacturer.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site to ensure uninterrupted progress of the work.
- B. Protect threads and seats from corrosion and damage. Rising stems and exposed stem valves shall be coated with a protective oil film which shall be maintained until time of use.
- C. Furnish covers for all openings.

1. All valves 3-in and larger shall be shipped and stored on site until time of use with wood or plywood covers on each valve end.
 2. All valves smaller than 3-in shall be shipped and stored as above except that heavy card board covers may be furnished instead of wood.
- D. Store equipment to permit easy access for inspection and identification. Any corrosion in evidence at the time of Owner acceptance shall be removed, or the valve shall be removed from the job.
- E. Store all equipment in covered storage off the ground.

PART 2 PRODUCTS

2.01 GENERAL

- A. All buried valves shall open clockwise.
- B. The use of a manufacturer's name and/or model or catalog number is for the purpose of establishing the standard of quality and general configuration desired.
- C. Valves shall be of the size shown on the Drawings or as noted and as far as possible equipment of the same type shall be identical and from one manufacturer.
- D. Valves shall have the name of the maker, nominal size, flow directional arrows, working pressure for which they are designed and standard to which they are manufactured cast in raised letters on some appropriate part of the body.
- E. Unless otherwise noted, valves shall have a minimum working pressure of 150 psi or be of the same working pressure as the pipe they connect to, whichever is higher, and suitable for the pressures noted where they are installed.
- F. Valves shall be of the same nominal diameter as the pipe or fittings they are connected to. Except as otherwise noted, joints shall be mechanical joints, with joint restraint where the adjacent piping is required to be restrained.
- G. Valves shall be especially constructed for buried service.

2.02 VALVE BOXES

- A. All gate valves shall be provided with extension shafts, operating nuts and valve boxes as follows:
 - 1. Valve boxes shall be as manufactured by; Mueller; Tyler; Bailey or equal and shall be a heavy-pattern cast iron, three-piece, telescoping type box with dome base suitable for installation on the buried valves. Inside diameter shall be at least 4-1/2-in. Barrel length shall be adapted to the depth of cover, with a lap of at least 6-in when in the most extended position. Covers shall be cast iron with integrally-cast direction-to- open arrow. Aluminum or plastic are not acceptable. A means of lateral support for the valve extension shafts shall be provided in the top portion of the valve box.
 - 2. The upper section of each box shall have a top flange of sufficient bearing area to prevent settling. The bottom of the lower section shall enclose the stuffing box and operating nut of the valve and shall be oval.
 - 3. An approved operating key or wrench shall be furnished.
 - 4. All fasteners shall be Type 304 stainless steel.

2.03 RESILIENT SEATED GATE VALVES

- A. Valves shall be manufactured in accordance with AWWA C509, and be American Flow Control - AFC-2500 or Mueller Co.- 2360/2361 series. All valves shall open right.
- B. Valves shall be provided with a minimum of two O-ring stem seals.
- C. Bonnet and gland bolts and nuts shall be either fabricated from low alloy-steel for corrosion resistance or electroplated with zinc or cadmium. The hot-dip process in accordance with ASTM A153 is not acceptable.
- D. Wedges shall be totally encapsulated.
- E. Units shall be, in addition, UL and FM approved.

2.04 FIRE HYDRANTS

- A. Fire hydrants shall be dry-barrel type conforming to the requirements of AWWA C502. Hydrants shall be designed such that the hydrant valve closes with line pressure preventing loss of water and consequent flooding in the event of traffic damage.

- B. Hydrants shall have 6-in mechanical joint inlet connections, two 2-1/2-in hose connections and one 4-1/2-in pumper connection. Threads for the hose and pumper connections shall be in accordance with National Standard Thread. Hydrants shall be according to manufacturer's standard pattern. Hydrants shall be equipped with O-ring packing. Each nozzle cap shall be provided with a Buna-N rubber washer.
- C. Hydrants shall be so arranged that the direction of outlets may be turned 90 degrees without interference with the drip mechanism or obstructing the discharge from any outlet.
- D. A bronze or rustproof steel nut and check nut shall be provided to hold the main hydrant valve on its stem.
- E. Hydrant valve opening shall have an area at least equal to that area of a 5-1/4-in minimum diameter circle and be obstructed only by the valve rod. Each hydrant shall be able to deliver 500 gallons minimum through its two 2-1/2-in hose nozzles when opened together with a loss of not more than 2 psi in the hydrant.
- F. Hydrants shall be designed for installation in a trench that will provide minimum cover as noted on Drawings. Hydrant extensions shall be as manufactured by the company furnishing the hydrants and of a style appropriate for the hydrants as furnished.
- G. Hydrants shall open by turning operating nut to right (clockwise) and shall be marked with a raised arrow and the work "open" to indicate the direction to turn stem to open hydrant.
- H. Hydrants shall be furnished with caps, double galvanized steel hose cap chain, galvanized steel pumper hose cap chain, a galvanized steel chain holder and any other hooks and/or appurtenances required for proper use.
- I. Hydrant operating nut shall be AWWA Standard pentagonal type measuring 1-1/2-in point to flat.
- J. Hydrants shall be hydrostatically tested as specified in AWWA C502.
- K. Hydrants shall be Centurian No. A-423 as manufactured by Mueller, or American Darling.
- L. All iron work to be set below ground, after being thoroughly cleaned, shall be painted with two coats of asphalt varnish specified in AWWA C502. Iron work to be left above ground shall be shop painted with two coats of paint of quality and color to correspond to the present standard of the Owner.

2.05 SURFACE PREPARATION AND SHOP COATINGS

- A. The interior ferrous metal surfaces, except finished or bearing surfaces, shall be blast cleaned in accordance with SSPC SP-10 and painted with two coats of an approved two-component epoxy coating specifically formulated for potable water use. The coating shall be NSF certified to Standard 61.
- B. Exterior ferrous metal surfaces of all buried valves and hydrants shall be blast cleaned in accordance with SSPC SP-6 and given two shop coats of an approved two-component coal tar epoxy paint.
- C. Exterior ferrous metal surfaces of all non-buried valves shall be shop painted with one coat of primer in accordance with the requirements of Section 09901.

2.06 CORPORATION STOPS

- A. Corporation stops shall be brass with Mueller-type threads, not less than 1-in in diameter and shall be installed where shown, specified or required.
- B. Corporation stops shall be Figure H-10003 as manufactured by Mueller Company or equal.

PART 3 EXECUTION

3.01 INSPECTION AND PREPARATION

- A. During installation of all valves and appurtenances, verify that all items are clean, free of defects in material and workmanship and function properly.
- B. All valves shall be closed and kept closed until otherwise directed by the Engineer.

3.02 INSTALLATION OF BURIED VALVES AND VALVE BOXES

- A. Buried valves shall be cleaned and manually operated before installation. Buried valves and valve boxes shall be set with the stem vertically aligned in the center of the valve box. Valves shall be set on a firm foundation and supported by tamping pipe bedding material under the sides of the valve. The valve box shall be supported during backfilling and maintained in vertical alignment with the top flush with finish grade. The valve box shall be set so as not to transmit traffic loads to the valve.
- B. Before backfilling, all exposed portions of any bolts shall be coated with two coats of bituminous paint.
- C. Install valve floor stand operators with stainless steel bolts.

3.03 INSTALLATION OF FIRE HYDRANTS

- A. Fire hydrants shall be set at the locations as shown on the Drawings and bedded on a firm foundation. Hydrants and connecting pipe shall have at least the same depth of cover as the distributing pipe. A drainage pit as detailed on the Drawings shall be filled with screened gravel and compacted. The hydrants shall be set upon a slab of concrete not less than 4-in thick and 15-in square. During backfilling, additional screened gravel shall be brought up around and 6-in over the drain port. Each hydrant shall be set in true vertical alignment and properly braced.
- B. Concrete thrust blocks shall be placed between the back of the hydrant inlet and undisturbed soil at the end of the trench. Minimum bearing area shall be as shown on the Drawings. Felt roofing paper shall be placed around hydrant elbow before placing concrete. Care shall be taken to ensure that concrete does not plug the drain ports.
- C. The hydrant shall be tied to the pipe with suitable rods or clamps, galvanized, painted, or otherwise rustproof treated. Hydrant paint shall be touched up as required after installation.
- D. Fire hydrants shall be painted in accordance with Owner's standard practice.

3.04 INSTALLATION OF CORPORATION STOPS

- A. The tapping machine shall be rigidly fastened to the ductile iron pipe as near the horizontal diameter as possible. The length of travel of the tap should be so established that when the stop is inserted and tightened with a 14-in wrench, not more than one to three threads will be exposed on the outside. When a wet tapping machine is used, the corporation cock shall be inserted into the machine while it is still in place.

3.05 FIELD TESTS AND ADJUSTMENTS

- A. Conduct a functional field test of each valve, including actuators and valve control equipment, in presence of Engineer to demonstrate that each part and all components together function correctly. All testing equipment required shall be furnished by the Contractor.

3.06 MANUFACTURER'S SERVICE

- A. Furnish the services of a qualified representative of the tapping equipment manufacturer to provide on-site instruction during wet tapping of the existing water mains indicated on the Drawings.
- B. Following installation of the butterfly valves, furnish the services of a qualified, factory-trained representative of the manufacturer of the respective valves, to check the installations before they are placed in operation, supervise initial operations and testing in the presence of the Engineer, instruct the plant personnel in care and maintenance of the equipment, and make all necessary field adjustments. A minimum of one 8-hour days shall be provided for these services. In the event of trouble with the equipment, the

representative of the respective manufacturer shall revisit the site as often as necessary until all troubles are corrected and the installation is entirely satisfactory.

END OF SECTION

SECTION 02656

TEMPORARY SERVICES

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and install and remove steel by-pass and temporary service pipe and fire hydrants of the sizes required to provide adequate service to all water consumers whose service will be interrupted by new water main installation and to fulfill fire service requirements. Existing fire hydrants connected to pipe being replaced and serving as temporary fire hydrants shall be connected to the temporary pipe at locations directed by the Engineer.
- B. Furnish temporary water service to single and multiple family residences and to other water customers with small diameter services currently connected to mains to be shut off, in order to facilitate the work, by means of temporary hose connections. These temporary service connections shall be made to sill cocks outside the buildings or to temporary connections at the meter inside the buildings, as may be required or directed. The temporary piping and service connections shall not be measured for payment and shall not be included on the Bid Form. Payment for temporary service shall be included in the unit Bid Price for furnishing and installing the various sizes of ductile iron pipe.
- C. In cases where access to the building water meter is not possible or where temporary service connection using hoses would not provide adequate supply capacity a temporary service connection shall be made to the existing service pipe in the street between the corporation cock at the main and the curb stop, or in the sidewalk area between the curb stop and the service shut off valves inside the building.
- D. The work of relocating existing service and of furnishing and installing temporary service pipe, temporary customer services and other branches, maintaining the same, providing suitable safety precautions and removal of the temporary service pipe system shall be the sole responsibility and expense of the Contractor.
- E. Temporary services shall not be used between November 1st and March 30th.

1.02 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM B88 - Standard Specification for Seamless Copper Water Tube.
- B. American Water Works Association (AWWA)
 - 1. AWWA C651 - Disinfecting Water Mains.
- C. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

PART 2 PRODUCTS

2.01 TEMPORARY SERVICE PIPE

- A. The temporary service pipe, connections and branches shall be made of steel pressure pipe and shall be of the highest quality and shall be fully adequate to withstand the pressures and all conditions of use.
- B. Corporation cocks shall be Mueller 15008 conductive compression with standard tapered Mueller "CC" threads.
- C. Curb stops shall be McDonald 6100T conductive compression teflon coated ball valves.
- D. Copper tubing of the sizes required shall be Type "K" soft temper conforming to ASTM B88. The name and type shall be stamped at intervals along the pipe.
- E. Compression couplings for brass or copper pipe of 3/4 to 2-in shall be a three part compression union McDonald, Model 47581, all other couplings shall be Dresser, Style 38 of the sizes required.
- F. Curb boxes shall be a two piece telescoping cast iron design equal to the Buffalo, Model B-2010 top and 94.E bottom.
- G. Corporation adapters shall be McDonald Compression type.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Temporary service pipe shall not be installed without the prior approval of the Engineer.
- B. Submit a plan for the proposed layout of the temporary service pipe and connections to the existing distribution system for the Engineer's approval. This plan shall be drawn on a clean set of project drawings and the temporary service pipe layout shall be consistent with the proposed sequence of operations. Proposed changes in the layout of temporary service piping, as the work proceeds, shall also be submitted for the Engineer's approval.
- C. Generally, temporary service pipe shall be laid in gutters; however in business areas, if directed by the Engineer, lay temporary service pipe behind buildings. At driveways, pipe crossings shall be provided by cold patch cover or other approved method. At street intersections, cut a straight line in the existing bituminous paving and lay the temporary service pipe in a shallow trench covered with temporary surfacing. At the Engineer's options, use hose to come around bends or to cross driveways. Sanitary precautions shall be satisfactory to the Engineer and shall meet all requirements of the public health authorities having jurisdiction. The installation shall be watertight. Care shall be exercised throughout to avoid any possible pollution of mains, house services, or the temporary service pipe. The interior of temporary service pipe, temporary hoses and any other connection pipe to convey water for potable use shall be chlorinated prior to its use in accordance with AWWA C651.

- D. All temporary pipe shall be suitably valved and meet the approval of the Engineer. All temporary pipe shall be suitably sized to meet the approval of the Fire Chief. A valve shall be provided at each hydrant connection and each tap hole connection. Valves shall be located no further than 500-ft apart when directed by the Engineer.
- E. 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.
- F. Temporary service fire hydrants shall replace all existing hydrants deactivated for the new water main work. Temporary fire service hydrants shall be supplied by minimum 4-inch diameter temporary service pipes. Location and size of temporary fire service hydrants must be approved by the Engineer and Fire Chief.

END OF SECTION

SECTION 02657

STREET PLATES

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish, install, maintain, and remove street plates over street openings where, in the opinion of the Engineer, traffic requires unrestricted use of the street. At such locations work may be suspended during periods of heavy traffic, to insure the public safety.
- B. All street openings ordered decked by the Engineer shall be sheeted and braced regardless of depth unless otherwise instructed by the Engineer. The Contractor shall furnish, put in place, and maintain such sheeting and bracing required to support the sides of the excavation and prevent loss of ground which could damage or delay the work or endanger adjacent structures. If the Engineer is of the opinion that at any points sufficient or proper supports have not been provided, he may order additional supports placed at the expense of the Contractor. Compliance with such orders shall not relieve the Contractor from his responsibility for the sufficiency of such supports. Care shall be taken to prevent voids outside of the sheeting, but if voids are formed they shall be immediately filled and rammed.
- C. If street plates is placed by the Contractor over any opening when not so ordered by the Engineer, all costs of street plates at such locations, maintaining traffic and safeguarding open excavations shall be included in the price bid for cleaning and lining water mains.
- D. Before the street plates and supporting systems are placed, the Contractor shall submit to the Engineer detailed plans showing the structure he proposes to use. The construction shall be steel. The street plates and supports shall be of sufficient strength to carry a load of 200 psi over the entire deck area or 10 tons on axle with wheels five (5) feet on centers without exceeding the allowable stress specified in the ASSHTO Standard Specifications for Highway and Bridges.
- E. Street plates placed at an opening shall remain over the open excavation until backfilling is complete except to provide access while cleaning or lining the pipe, or for the removal and replacement of valves, or for other work under this Contract directed by the Engineer.

1.02 RELATED WORK NOT INCLUDED

- A. Do not enter or occupy private land outside of easements, except by permission of the land owner.

PART 2 PRODUCTS

- A. Materials and structures shall conform to the requirements of Paragraph 1.01 Scope of Work, this section.

PART 3 EXECUTION

- A. Execution of street plates work shall conform to the requirements of Paragraph 1.01 Scope of Work, this section.

END OF SECTION

SECTION 02658

TAP HOLES

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required for providing tap holes as required by the Engineer.
- B. The work to be done, without limiting the generality thereof, shall be as follows:
 - 1. Excavate all tap holes as required.
 - 2. Provide at no additional cost, sheeting and bracing, and decking as required.
 - 3. Make 4-inch taps in existing water mains.
 - 4. Plug the tap hole when the work is completed.
 - 5. Backfill all tap holes as required.
 - 6. Restore the excavated surface.
- C. Measurement and payment for the tap holes is included in Type "B" temporary service connections.

1.02 RELATED WORK NOT INCLUDED

- A. Excavation and backfill is included under Section 02221.
- B. Temporary service pipe is included under Section 02656.

PART 2 PRODUCTS

2.01 TAPS

- A. Two inch corporation stops shall be provided by the Contractor.

PART 3 EXECUTION

3.01 TAPS

- A. Make the required 2-inch taps using approved methods as directed by the Engineer.
- B. Wet tap connections (4-inch) will be installed for temporary water supply to users where interruptions to water supply is deemed impossible. Contractor shall furnish all labor, materials, equipment and incidentals required to install the connection. Wet tap connections will be made only at the discretion of the Engineer.

END OF SECTION

SECTION 02760

CLEANING AND LINING WATER MAINS

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required for cleaning and cement lining in place existing water mains, and all incidental and related work, as shown on the Drawings and as specified herein.
- B. The work to be done, without limiting the generality thereof, shall be as follows:
 - 1. Excavate and backfill all pits and trenches necessary for pipe removal. Sheet, brace and deck trenches as necessary for safety.
 - 2. Make all necessary pipe openings. Maintain adequate cover on open pipe and replace pipe.
 - 3. Clean and cement-line pipe. The method of cleaning the existing water mains, will be the dragline method only.
 - 4. Chlorinate pipe lines.
 - 5. Restore all excavated surfaces.
- C. All work shall be in accordance with AWWA C602, or insofar as they apply unless otherwise specified.
- D. All excavations within the rights-of-way of public streets shall be sheeted. The cost of sheeting shall be in the unit price for cleaning and cement mortar lining.

1.02 RELATED WORK

- A. Earth excavation and backfill is included in Section 02221.
- B. New pipe and fittings to be furnished and installed are included in Section 02616.
- C. New valves and appurtenances to be installed are included in Section 02640.
- D. Decking excavations in public streets and roads is included under Section 2657.
- E. Temporary services are included under Section 02656.

1.04 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar.
 - 2. ASTM C150 - Standard Specification for Portland Cement.

- B. American Water Works Association (AWWA)
 - 1. AWWA C602 - Cement-Mortar Lining of Water Pipeline in Place 4-in (100mm) and Larger.
 - 2. AWWA C651 - Disinfecting Water Mains.
- C. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.05 PIPE OPENINGS

- A. Make all openings in the existing pipe line as necessary to carry on the work. Such openings shall include the openings required to replace mainline and sideline valves, openings for access to the pipeline and additional openings in the pipeline at any other location approved by the Engineer.
- B. Openings in the existing pipeline shall be "square" - in a plane exactly perpendicular to the axis of the pipe section cut. The use of "squeeze type" or "chain type" cutters will not be allowed.
- C. Once the pipe is open, keep the open ends covered and plugged as directed by the Engineer to prevent any run-off or other foreign matter from entering into it until such time that it is again closed.
- D. Pipe closures shall be made using Dresser, Style 38 or 138 couplings, similar to Rockwell International, as required, for cast-iron pipe or equal. After installation, couplings shall be cleaned, dried and given a coat of "Bitumastic 50" by Koppers Co. or equal.

1.06 OBSTRUCTIONS

- A. Notify the Engineer of any obstruction before proceeding with the necessary excavations and all other related work.
- B. Obstructions in the pipeline that prohibit the passage of cleaning and/or lining equipment shall be removed by the contractor. These include, but are not limited to:
 - 1. Bends, reducers, valves or other such fittings not indicated on drawings provided by the Engineer.
 - 2. Over poured lead joints.
 - 3. Deformations in the pipe wall, out-of-round pipe, or defective pipe.
 - 4. Protruding lateral or service connections.
 - 5. Internal tie rods.
 - 6. Successive cocked joints.

1.07 GUARANTEE OF CEMENT-MORTAR LINING

- A. Guarantee all materials and workmanship furnished under this Contract against deterioration and failure for a period of 1 year after final acceptance of the work. Any deteriorated cement-mortar lining shall be repaired by patching or by removal and replacement as may be deemed necessary by the Engineer. Repairs or replacement shall include removal of defective lining, cleaning of the pipes, cutting and repairing or replacing access openings and all incidental work. Repair work shall be in conformity with this Section and at the sole expense of the Contractor.
- B. Restore all cleaned and cement-mortar-lined water mains to the following coefficients "C" in Hazen-Williams formula, all based on nominal pipe diameters with proper allowance being made for bends and fittings in accordance with accepted practice:

<u>Nominal Pipe Diameter</u>	<u>Guaranteed Coefficient "C"</u> <u>Hazen-Williams Formula</u>
20-in	135
16-in	130
12-in	120
10-in	115
8-in	110
6-in	105

- C. After the mains under this Contract have been cleaned and cement-mortar-lined, the Engineer may make a loss of head tests to determine coefficient "C" in the Hazen-Williams formula at no cost to the Contractor.
- D. If, in any section of cleaned and lined water main, the coefficient "C" as determined by the loss-of-head tests fails to meet the guaranteed figure, the unit price bid for cleaning and cement mortar lining that size pipe will be reduced as follows:
 - 1. For drop of five points or fraction thereof below the guaranteed coefficient there will be no reduction in price.
 - 2. For the next ten points drop in excess of five points below the guaranteed coefficient, the unit price shall be reduced by 1 percent per point.
 - 3. For a drop in excess of fifteen points below the guaranteed coefficient, the Engineer will decide whether a further reduction in payment of 2 percent per point below fifteen points will be made, or if the cement-mortar-lining shall be removed and the water main properly cement-mortar-lined again at no expense to the Owner.
- E. For the purpose of establishing "C" coefficient on such mains where it is not practicable to carry the loss-of-head test through the full extent of the cleaned and cement-mortar-lined main, the several sections thereof shall be tested and the weighted average coefficient "C" from test of such portions shall be considered to be acceptable for the whole of the cleaned and cement-mortar-lined main.
- F. Take all necessary steps to attain the required coefficient before deductions, if any, will be determined.

- G. All tests for establishing the coefficient "C" for water mains cleaned and cement-mortar-lined under this Contract shall be completed prior to final acceptance of this job.

PART 2 PRODUCTS

2.01 CEMENT MORTAR LINING

- A. As soon as practicable after a section of pipeline has been cleaned and approved by the Engineer, cement-mortar-lining shall be applied to the interior of the pipeline. The cement-mortar-lining shall be continuous, dense and of uniform quality. The lining thickness of mains 16-in in diameter and larger shall not be less than 1/4-in and nowhere in excess of 3/8-in. The lining thickness for mains 14-in diameter and smaller shall be not less than 3/16-in and nowhere in excess of 5/16-in.
- B. Cement-mortar shall be the proportion of one part of cement and one to one and one-half parts of screened sand by volume: the exact proportion shall be designed to produce the most satisfactory mortar with the sand to be used.
- C. Unless otherwise permitted, cement used in the mortar mix shall be portland cement.
- D. The water cement ratio shall be maintained at a minimum and shall be carefully controlled at all times. The use of mortar which has attained its initial set prior to being applied to the pipe will not be allowed. Cement, sand and water shall be mixed by machine for not less than 3 minutes to obtain proper plasticity before being applied to the inside surface of the pipe.
- E. No admixture shall be added to the cement-mortar unless specifically permitted by the Engineer.
- F. Portland cement shall meet the requirements of ASTM C150, Type II and shall, if deemed necessary by the Engineer, be passed through a 16-mesh screen before incorporation into the mortar.
- G. Cement mortar lining shall be tested for strength evaluation and absorption quality. The minimum allowable strength of the cement lining shall be 5000 psi at 28 days.
- H. Sand shall be clean, sharp, well-graded, with no organic impurities and shall meet the requirements of ASTM C144 as to quality and shall be graded within the following limits, depending on whether natural sand or manufactured sand is used. Two, 100 lb bags of sand proposed for this project shall be delivered to the Engineer for a sieve analysis prior to use on this job. No lining will be allowed until the Engineer is satisfied that the proposed sand meets all requirements specified herein. Once the sand is shipped to the job site, the Engineer may take random samples of the sand for additional testing. If two randomly selected 100 lb bags, selected at the job site for further testing fail to meet the requirements stated herein, all sand shipped to the site shall be rejected at no cost to the Owner. The Engineer will not allow any water mains to be taken out of service until the requirements for sand are approved.

Passing

<u>Sieve</u>	<u>Natural Sand</u>	<u>Manufactured Sand</u>
4	100	100
8	95 to 100	95 - 100
16	70 to 100	70 - 100
30	40 to 75	40 - 75
50	10 to 35	20 - 40
100	2 to 15	10 - 25
200	-	0 - 10

- I. Not more than 60 percent of the sand shall be retained between any two consecutive sieves and not more than 25 percent retained between the No. 50 and the No. 100 sieves.
- J. The fineness modulus of the sand shall be 2.25 plus or minus 0.20.
- K. Field mixing of sand will not be permitted.
- L. Water shall be clean and free from injurious ingredients.

PART 3 EXECUTION

3.01 CLEANING

- A. Cleaning shall be by the dragline method only. All rust, tubercles, deposits, old coating and other foreign materials shall be removed from the inside of the pipe, leaving the surface satisfactory for the application of cement-mortar-lining. Several passages of the cleaning machine through the pipe shall be made, if required, to produce the specified results. The metal surface shall be free from deposits or residue, which could prevent the bonding of the cement-mortar-lining. If necessary, the interior of the pipe shall be washed or wiped clean. The materials scrapped from the pipe shall be removed from the site at the end of each working day and shall be disposed of properly.
- B. Each section being cleaned shall be flushed with water during the progress of the cleaning. Dry cleaning will not be permitted. Furnish cable sheaves or blocks, adequately secured, to avoid contact between the cable and pipe wall, to prevent scoring or grooving the pipe by the cable. Any damage to pipe or fittings resulting from failure to meet this requirement shall be removed and replaced by the Contractor, at his/her expense, with new pipeline materials as directed by the Engineer and subject to approval. Any replacement work shall be tested to withstand the severest operating conditions of the existing pipeline.
- C. Take precautions to prevent obstruction of any lateral, hydrant, or service connection by deposit of cleaning debris. If requested by the Engineer, backflush all laterals, hydrants and service connections after cleaning. Restore such connections to normal service condition at own expense.
- D. When side-line valves on lateral water mains adjacent to the section being worked cannot be tightly shut off by the Owner, the Engineer may direct to replace the existing side-line valve at the unit price agreed upon in the Bid Form. The Engineer may direct to cut and drain the lateral adjacent to main pipeline as follows. Excavate a pit around the lateral main, off the main street and in the side street, saw a clean square cut into the bottom of the main and pump away the

sideline leakage that would interfere with proper application and curing of the cement mortar lining.

- E. After review and approval by the Engineer, dispose of cleaning water and the residue from cleaning the mains. Furnish effective means for settling particulate matter from sediment-bearing effluents produced by the pipeline cleaning. No pipeline cleaning effluents shall be released to existing drainage systems or waterways without being passed through an effective sedimentation tank, or other suitable device, or temporary basin furnished. Examine the locations where cuts are to be made and make adequate preparations to avoid the flooding of streets and adjacent structures or private property. Precaution shall be taken to prevent cleaning wastes from being deposited in drains, sewers, or waterways. Immediately following cleaning, the street and affected areas shall be hosed and swept clean.
- F. Any short runs of pipe, or the interiors of fittings, cleaned by a method or equipment other than that employed for cleaning main-line sections of the pipeline, shall be cleaned to the same standard as specified under Paragraph 3.01A above.
- G. Dispose of waste materials generated in the process of cleaning the mains in an approved manner. Satisfactory method of disposal of wastes materials shall conform to the following specific requirements of the contract and shall also include taking such other measures necessary for the safety of the public and the avoidance of visual or physical nuisance conditions created by solid, liquid, or semi-solid waste discharges or storage volumes. The specific requirements (which, by themselves, may not include all measures necessary to accomplish the required results) include the following:
 - 1. It is understood that only the "drag" method of cleaning shall be used on this project (except where hand-cleaning is required) and that the "hydraulic" method shall not be used. Accordingly there shall be no discharges of hydraulically-suspended pipe-cleaning sediments.
 - 2. The water drained from the mains shall be discharged or pumped to storm drains and not to sanitary sewers.
 - 3. All solid, particulate, or semi-solid material scraped from the mains by the "drag" cleaning process shall be confined so they are not eroded by rainfall and runoff and shall be trucked away to a landfill disposal site or ad daily basis as they are generated.

3.02 PLACING CEMENT-MORTAR LININGS

- A. Cement-mortar-lining shall be placed by machine having the following features:
 - 1. An applicator head, that will centrifugally project the mortar against the wall of the pipe at a higher velocity in such a manner as to produce a dense mortar lining of uniform thickness.
 - 2. An attachment with rotating or drag steel trowels following the applicator head troweling the cement-mortar-lining to a smooth, hard surface of uniform thickness. The trowels shall be cleaned at frequent intervals to prevent accumulated mortar from obtaining initial set and drawing a sanded unglazed finish. The operation of the trowels shall be continuous with the application of cement-mortar and forward movement of the applicator head.

3. The machine shall move ahead of the lining so that nothing will come in contact with the troweled surface until it has attained its final set. Control of the forward movement of the machine and of the mechanical placing of the mortar shall be provided to assure a uniform thickness of mortar lining as specified above.
- B. Sections of the pipeline that have an access opening at one end of the section only (e.g. where there is a valve closed against an active section of the pipeline at the opposite end) shall be lined by machine for the maximum distance mechanically possible and the remaining distance shall be lined by hand placing of mortar.
 - C. All waste material, spatter and mortar of improper consistency such as may result from starting or stopping the machine, shall be removed from the pipe ahead of the trowels. Only mortar of suitable consistency and which adheres firmly to the pipe shall be troweled finally to form the finished lining. Where in limited areas, the machine fails to produce a smooth finish, free from trowel marks and imperfections, hand troweling may be used to correct the imperfections. Hand troweling, if allowed, shall be done as soon as possible after the application of the machine lining. Freshly mixed mortar of approved consistency shall be used to fill voids.
 - D. Mortar may be applied by hand to sections of pipe used to close access openings in mains.
 - E. Any leakage into the main line that would adversely affect the placement and/or curing of the mortar shall not be permitted.
 - F. If any section of lining shows evidence of failure, undue irregularity or inferior workmanship, or requires excessive patching, or shows segregation or deficiency in cement content, remove the faulty section, re-clean the pipe and reline in accordance with this Section.
 - G. Mortar lining applied by hand shall be placed and finished to the same standard of quality as is attained by machine placing and troweling of the cement-mortar-lining.

3.03 CURING

- A. Immediately upon the completion of the lining of a length of pipe between access openings or at the end of a day's run, that section of pipe shall be closed at each end and the access openings covered to prevent the circulation of air. As soon as practicable after the placing of the lining, a sufficient amount of water shall be introduced into the section between bulkheads or valves to create a moist atmosphere and keep the lining damp.

3.04 CONNECTIONS AND APPURTENANCES

- A. After placing the lining in mains, all valves, laterals, appurtenances and service lines shall be cleared of mortar or other materials deposited during the lining operations. If service lines are cleared by means of compressed air applied at the service line meter connection, blow back shall be done before initial set has occurred in the cement-mortar applied to the pipe. Compressed air pressure for blow-back operations shall be regulated to produce a clear service opening and prevent dislodging or blistering of cement-mortar-lining in the main.
- B. If a different method is proposed other than the use of compressed air for cleaning service lines, etc, of mortar or other materials, such method shall be subject to the approval of the Engineer.

- C. After placement of the mortar lining is completed, the completed sections shall be filled with water and chlorinated as soon as possible so the mortar lining cures under water. The completed main shall overflow through hydrants and not be brought to service pressure until the adjacent valves are adequately blocked by completed pipe closures.

3.05 PROTECTION OF LINING

- A. Should the finished lining be damaged through negligence, or reveal evidence of defective work or materials at any time previous to the completion of this Contract, such damage or defective portions shall be removed to the extent directed and replaced to the full satisfaction of the Engineer.

3.06 CLEANING AND CHLORINATING INSIDE OF PIPE

- A. All reasonable precautions shall be taken to prevent contamination of the interior of the pipelines by water from excavations and otherwise. Upon completion of the work and before chlorinating, all fragments of mortar and other debris shall be removed so that the pipeline is clean and ready for use in all respects pending the application of Chlorine.
- B. Upon completion of all cleaning and lining operations in a section of pipe line and after the work has been approved by the Engineer, chlorinate the interior of the completed section in accordance with AWWA C651. All materials, equipment, labor and chlorine shall be furnished by the Contractor. The entire procedure of chlorinating the pipes shall be discussed in advance of the time the work is to be done and the methods employed shall be fully satisfactory to the Engineer and Water Works Department as they relate to the Contract as a whole and to the operation of the distribution system.
- C. In general, the procedure of chlorinating the main shall be to apply the chlorine in approved dosage through a tap in one end of the section while drawing water from or near the other end of the section, at which location the rate of flow may be approximated. The chlorine solution shall be allowed to remain in the pipe for at least 24 hours and the section shall be thoroughly flushed out before being placed in use. Special procedures may be outlined by the Engineer where the above outlined method is not practicable. The entire procedure of chlorinating the mains shall be such as to prevent flows of water from a section exposed to possible contamination to a section of pipe which has been completed and chlorinated. Should such water from a contaminated section be allowed to enter a previously chlorinated section as a result of negligence or through necessity caused by failure to properly schedule the work, the section or sections of pipe thus affected shall be rechlorinated at the Contractor's own expense. Any temporary connection to the mains or other facilities required to accomplish the chlorination as just described shall be at the Contractor's expense.
- D. Prior to returning the main to service, the Owner will have the water tested after chlorination to determine if it is contaminated. In the event the water is contaminated, rechlorinate and/or perform all work necessary to make the main acceptable. No claims shall be made for such delays. No additional payment will be made for rechlorination and/or any other work required to make the main acceptable.

3.07 LEAKAGE

- A. If any leaks occur in the water mains at locations where sections have been removed for access and later replaced, or if leaks occur at any other locations which are directly attributable to the operations in the cleaning and lining of mains, at the Contractor's own expense, uncover and satisfactorily repair such leaks before the contract is declared completed and is finally accepted.

END OF SECTION

SECTION 02901

MISCELLANEOUS WORK AND CLEANUP

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and perform the miscellaneous work not specified in other sections but obviously necessary for the proper completion of the work as shown on the Drawings.
- B. When applicable, perform the work in accordance with other related Sections. When no applicable specification exists, perform the work in accordance with the best modern practice and/or as directed by the Engineer.
- C. The work of this Section includes, but is not limited to, the following:
 - 1. Crossing and relocating existing utilities.
 - 2. Restoring driveways and sidewalks.
 - 3. Cleaning up.
 - 4. Incidental work.
 - 5. Job photographs.
 - 6. Protection and/or removal and reinstallation of signs, lampposts and mailboxes.
 - 7. Restoration and replacement of curbing.
 - 8. Connection to work by others
 - 9. Protection and bracing of utility poles.
 - 10. Restoring easement and right-of-ways.
 - 11. Temporary facilities
 - 12. Traffic control plans and devices
 - 13. Traffic control loops
 - 14. Complying with construction permits
- D. Submit to the Engineer, in accordance with Article 2.05B of the General Conditions, a breakdown of the lump sum for miscellaneous work and cleanup including the above items as a minimum. This breakdown shall be subject to the approval of the Owner and when so approved

shall be the basis for determining progress payments and for negotiations of change orders, if required.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Materials required for this Section shall be the same quality of materials that are to be restored. Where possible, re-use existing materials that are removed.

PART 3 EXECUTION

3.01 CROSSING AND RELOCATING EXISTING UTILITIES

- A. Perform any extra work required in crossing culverts, water courses, including brooks and drainage ditches, storm drains, gas mains, water mains, electric, telephone, gas and water services and other utilities. This work shall include: bracing, hand excavation, backfill (except screened gravel) and any other work required for crossing the utility or obstruction not included for payment in other items in the Bid Form. Notification of Utility Companies shall be as specified in Section 01046.
- B. In locations where existing utilities cannot be crossed without interfering with the construction of the work as shown on the Drawings, remove and relocate the utility as directed by the Engineer or cooperate with the Utility Companies concerned if they relocate their own utility.
- C. At pipe crossings and where designated by the Engineer, furnish and place screened gravel bedding so that the existing utility or pipe is firmly supported for its entire exposed length. The bedding shall extend to the mid-diameter of the pipe crossed. Payment for screened gravel at pipe crossings will be made according to the unit price bid established in the Bid Form.

3.02 RESTORING DRIVEWAYS AND SIDEWALKS

- A. Existing public and private driveways disturbed by the construction shall be replaced. Paved drives shall be repaved to the limits and thicknesses existing prior to construction. Gravel drives shall be replaced and regarded in kind.
- B. Existing public and private sidewalks disturbed by the construction shall be replaced with sidewalks of equal quality and dimension.

3.03 CLEANING UP

- A. Remove all construction material, excess excavation, buildings, equipment and other debris remaining on the job as a result of construction operations and restore the site of the work to a neat and orderly condition.

3.04 INCIDENTAL WORK

- A. Do all incidental work not otherwise specified, but obviously necessary to the proper completion of the work as shown on the Drawings and as specified herein.

3.05 PHOTOGRAPHS OF PROJECT

- A. Prior to the excavation in any street or cross country area, document existing conditions using construction photographs as detailed in Section 01300.
- B. The photographs shall be retained in a secure location throughout the duration of the project and shall then be turned over to the Owner.

3.06 REMOVAL AND REPLACEMENT OF SIGNS, LAMPPOSTS AND MAILBOXES

- A. Existing signs, lampposts and mailboxes which may be damaged or removed during the course of installing the new pipelines shall be reinstalled in a vertical position at the same location from which they were removed. Replace damaged items with items of equal or better quality than the damaged items. Provide a concrete anchor as necessary, to ensure a rigid alignment. Exercise care in the reinstallation of all items to prevent damage to the newly installed pipelines.

3.07 RESTORATION AND REPLACEMENT OF CURBING

- A. Existing concrete, bituminous, timber or granite curbing shall be protected. If necessary, curbing shall be removed and replaced after backfilling. Curbing which is damaged during construction shall be replaced with curbing of equal quality and dimension at the Contractor's expense. Granite curbing removed and reset shall conform to Section 580.64 of the Massachusetts DPW Specifications. Joints between sections shall be pointed as required after resetting. Bituminous berms shall conform to Section 501 of the Mass DPW Specifications.

3.08 CONNECTION TO WORK BY OTHERS

- A. The Owner may utilize City personnel to connect existing water services to the new pipe. It will be necessary for the Contractor to plan his/her work and cooperate with the Owner insofar as connections required to each other's work and to prevent any interference and delay for which he/she shall receive no other compensation than that agreed upon for this Item.

3.09 PROTECTION AND BRACING OF UTILITY POLES

- A. Make all arrangements with the proper utility companies for bracing and protection of all utility poles that may be damaged or endangered by the operations. Work under this item shall include the related removal and reinstallation of guy wires, or support poles whether shown on the Drawings or not.

3.10 RESTORING EASEMENTS AND RIGHT-OF-WAYS

- A. Be responsible for all damage to private property due to the operations. Protect from injury all walls, fences, cultivated shrubbery and vegetables, fruit trees, pavement, underground facilities, such as water pipe, or other utilities which may be encountered along the route. If removal and replacement are required, it shall be done in a workmanlike manner so that replacement is equivalent to that which existed prior to construction.
- B. Existing lawn and sod surfaces damaged by construction shall be replaced. Cut and replace the lawn and sod, or restore the areas with an equivalent depth and quality of loam, seed and fertilizer as necessary to produce a stand of grass at least equal to that existing prior to construction. These areas shall be maintained and reseeded, if necessary, until all work under

this Contract has been completed and accepted. Any additional work required to restore property to the original condition shall be performed.

- C. Existing trees, shrubs, plants and bushes outside of easements shall be fully protected as specified in Section 01046. The work shall also include removing and replacing those trees, shrubs and bushes as indicated on the Drawings. It shall include the careful excavation of the root ball which shall be wrapped with burlap while out of the ground. Replant them after backfilling the trench, stake them in an upright position and shall periodically water replanted trees, bushes and shrubs. Be fully responsible for ensuring that any and all trees, bushes and shrubs removed and replanted "take" and return to a viable state. Any replanted item that fails to "take" or that is so damaged as to be unsuitable for replanting shall be replaced, at no additional cost to the Owner, with a tree, bush or shrub equal to the one removed.
- D. The Engineer will inspect all work for provisional acceptance upon the written request received at least 10 days before the anticipated date of inspection.
 - 1. After all necessary corrective work has been completed, the Engineer will certify in writing the provisional acceptance of the planting.
- E. All plants shall be guaranteed for not less than 1 full year from the time of provisional acceptance.
 - 1. At the end of this period, any plant that is missing, dead, or not in satisfactory growth, as determined by the Engineer, shall be replaced.
 - 2. All replacements shall be plants of the same kind and size. They shall be furnished and planted as specified herein. The cost of replacement shall be borne by the Contractor except where it can be definitely shown that loss resulted from vandalism or the Owner's failure to maintain planting as instructed.
 - 3. At the end of the guarantee period, inspection will be made by the Engineer upon written request submitted by the landscape contractor at least 10 days before the anticipated date.
 - 4. After all necessary corrective work has been completed and tree staking has been removed, the Engineer will certify in writing the final acceptance of the planting.

3.11 TEMPORARY FACILITIES

- A. Furnish, install, maintain and remove all temporary facilities required for construction or called for in this Section.

3.12 TRAFFIC CONTROL PLAN AND DEVICES

- A. The Contractor shall develop, implement and furnish and install a traffic control plan and devices that meet the requirements of the appropriate state agencies on State roadways and as specified in Section 1046.

3.13 TRAFFIC LOOPS

- A. The Contractor shall replace all traffic loops detectors and conduits disturbed by construction during this project. The loop detector lead shall be encased by metallic shield and insulated, and

all conduit openings shall be filled with duct seal as approved by the Engineer.

3.14 PERMITS

- A. The Contractor is responsible for complying with all permits associated with the project.

END OF SECTION

SECTION 03301

CONCRETE AND REINFORCING STEEL

PART 1 GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required and perform all concrete work as ordered by the Engineer, as shown on the Drawings and as specified herein.

1.02 SUBMITTALS

- A. Submit to the Engineer, in accordance with Section 01300, shop drawings showing locations of all joints and accessories. Submit full shop drawings and bar schedules for reinforcing steel. Submit technical data on all materials and components. Submit other data specified herein when required.

1.03 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM A185 - Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
 - 2. ASTM A615 - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 - 3. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
 - 4. ASTM C33 - Standard Specification for Concrete Aggregates
 - 5. ASTM C94 - Standard Specification for Ready-Mixed Concrete.
 - 6. ASTM C150 - Standard Specification for Portland Cement.
 - 7. ASTM D1752 - Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
- B. Where reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Cement shall be domestic portland cement conforming to ASTM C150, Type II.
- B. Fine aggregate shall be washed natural sand conforming to ASTM C33.

- C. Coarse aggregate shall be well graded crushed stone conforming to ASTM C33, size No. 67 unless otherwise directed.
- D. Water shall be potable, clean, and free from deleterious amounts of acids, alkalis, oils, or organic matter.
- E. No admixtures shall be used unless approved by the Engineer in writing.
- F. Reinforcing steel shall be deformed, intermediate grade, steel bars conforming to ASTM A615, Grade 40. Rail-steel bars will not be permitted in the work.
- G. Welded steel wire fabric shall be sized as shown and be in accordance with ASTM A185.
- H. Concrete aggregates which have been shown by test or actual service to produce concrete of the required strength, durability, watertightness and wearing qualities may be used where authorized by the Engineer.
- I. Chemical hardener shall be Lapidolith by Sonneborn; Hornolith by A.C. Horn; Penalith by W.R. Meadows or equal fluosilicate base material.
- J. Nonshrink grout shall be Masterflow 713 by the Master Builders Company; Euco N-S by Euclid Chemical Co.; Five Star Grout by U.S. Grout Corp. or equal.
- K. Bonding compound shall be Sikadur Hi Mod by Sika Corp., similar by Euclid Chemical Corporation; Master Builders or equal.
- L. Sealant shall be Sikaflex 1a by Sika Corp.; Vulkem 116 by Master Mechanics or equal.
- M. Premolded joint filler shall be self-expanding cork conforming to ASTM D1752, Type III, by A.C. Horn, Inc; W.R. Meadows, Inc. or equal.
- N. Bond Breaker. Provide tape or coating (except where tape is specifically shown) as approved.
 - 1. Bond breaker tape adhesive-backed glazed butyl or polyethylene tape which will satisfactorily adhere to the premolded joint filler or concrete surface as required. The tape shall be the same width as the joint.
 - 2. Bond breaker coating - a nonstaining type bond prevention coating, Williams Tilt-up Compound by Williams Distributors, Inc.; Silcoseal 77, by SCA Construction Supply Division; Superior Concrete Accessories or equal.

2.02 CONCRETE QUALITY

- A. Unless otherwise specified or directed, concrete shall be designed for a minimum allowable compressive strength of 3,500 psi at 28 days. Slump shall preferably be between 2 and 4-in and shall not exceed 5-in. Water shall be kept to a minimum to obtain concrete which is as dense and watertight as possible. The maximum water content shall be 6 gallons per 94 lb sack and the minimum cement factor shall be 5.7 (94 lb) sacks per cubic yard. The above ratios shall be revised for sacks of cement weighing different from 94-lbs per sack.

- B. Concrete required for State Highways shall be Class F (3500 psi) High Early Strength in accordance with the Standard Specifications for Highways and Bridges, 1973 Edition, by the Commonwealth of Massachusetts Department of Public Works.

2.03 MIXING CONCRETE

- A. Ready-mix concrete shall conform to ASTM C94 and the requirements herein, or as otherwise approved by the Engineer. If ready-mix concrete is to be used, the manufacturer shall furnish a statement to the Engineer for his approval giving the dry proportions to be used, with evidence that these will produce concrete of the quality specified.
- B. Concrete shall be mixed until there is a uniform distribution of the materials and shall be discharged completely before the mixer is recharged. The mixer shall be rotated at a speed recommended by the mixer manufacturer and mixing shall be continued for at least 1-1/2 minutes after all the materials are in the mixer. Concrete shall be placed within 1-1/2 hours of the time at which water was first added, otherwise it shall be rejected. Concrete which has been remixed or retempered, or to which an excess amount of water has been added, shall also be rejected.

2.04 FORMS

- A. Forms shall be free from roughness and imperfections, substantially watertight and adequately braced and tied to prevent motion when concrete is placed. No wooden spreaders will be allowed in the concrete.
- B. Wire ties will not be allowed. Metal ties or anchorages which are required within the forms shall be so constructed that the metal work can be removed for a depth of at least 1-in from the surface of the concrete without injury to such surface by spalling or otherwise. Forms shall be thoroughly cleaned before using and shall be treated with oil, or other approved material.

PART 3 EXECUTION

3.01 REINFORCING STEEL

- A. Reinforcement shall be accurately fabricated to the dimensions shown. Stirrups and tie bars shall be bent around a pin having a diameter not less than two times the minimum thickness of the bar. Bends for other bars shall be made around a pin having a diameter not less than six times the minimum thickness except for bars larger than 1-in, in which case the bends shall be made around a pin of 8-bar diameters. All bars shall be bent cold.
- B. Reinforcement shall be shipped to the work with bars of the same size and shape fastened in bundles with metal identification tags giving size and mark securely wired on. The identification tags shall be labeled with the same designation as shown on submitted bar schedules and shop drawings.
- C. All bars shall be stored off the ground and shall be protected from moisture and be kept free from dirt, oil, or injurious coatings.
- D. Unless otherwise shown, splices in reinforcement shall be lapped not less than 24 diameters. All bar splices shall be staggered wherever possible. When splicing bars of different diameters, the length of lap is based on the larger bar.

- E. Splices in welded wire fabric shall be lapped not less than 1-1/2 courses or 12-in, whichever is greater. Wire fabric splices shall be tied together with wire ties spaced no more than 24-in on center.
- F. Before being placed in position, reinforcement shall be thoroughly cleaned of loose mill and rust scale, dirt and other coatings, including ice, that reduce or destroy bond. Where there is delay in depositing concrete after reinforcement is in place, bars shall be reinspected and cleaned when necessary.
- G. Reinforcement which is to be exposed for a considerable length of time after being placed shall be painted with a heavy coat of cement grout, if required.
- H. In no case shall any reinforcing steel be covered with concrete until the amount and position of the reinforcements have been checked by the Engineer and his permission given to proceed with the concreting.

3.02 PREPARATION OF SURFACES

- A. All surfaces to receive bonding compound shall be prepared in accordance with the manufacturer's recommendations before the application of the bonding compound.

3.03 PLACING CONCRETE

- A. Reinforcement, where required, shall be accurately placed in exact positions shown, shall be secured against displacement with annealed iron wire ties or suitable clips at intersections and shall have a clear space of 2-in between the steel and face of forms unless otherwise indicated. Wire ties passing through the forms for the purpose of holding the steel in proper position will not be allowed. Concrete blocks with wire ties cast therein may be used where approved by the Engineer for the purpose of maintaining the clearance between reinforcement and forms. Reinforcing bars shall be free from rust, scale, dirt, grease and injurious contaminants.
- B. No concrete shall be placed until forms and method of placement have been approved by the Engineer. Before depositing concrete, all debris, foreign matter, dirt and water shall be removed from the forms. The surface of concrete previously placed, such as manhole base or horizontal construction joint, shall be cleaned and brushed with cement paste. Concrete shall not be placed in water or submerged within 24 hours after placing, nor shall running water be permitted to flow over the surface of fresh concrete within 4 days after its placing.
- C. High frequency mechanical vibrators shall be used to the extent necessary to obtain proper consolidation of the concrete. Care shall be taken to avoid segregation of aggregates by excessive vibration. Concrete adjacent to forms and around pipe stubs shall be carefully spaded or rodded.
- D. Concrete walls shall be deposited in one continuous operation with concrete brought up evenly on all sides. Chutes shall be of metal, "U" shaped, and provided with a baffle plate at the end, if necessary, to prevent segregation of materials. Chutes shall be placed at an angle of not less than 25 degrees, nor more than 45 degrees from horizontal and they shall be kept clean and free from hardened concrete.

- E. No concrete shall be mixed or placed during freezing weather without explicit permission. When placing concrete when air temperature is below 40 degrees F, the water, sand and gravel shall be heated so that the temperature of the concrete will be at least 50 degrees F. This temperature shall be maintained for 72 hours after placing. No concrete shall be placed on frozen ground.

3.04 CONCRETE ENCASEMENTS AND THRUST BLOCKS

- A. Concrete encasements shall be placed as shown and as directed by the Engineer. Backfill shall not be placed on the concrete until permitted by the Engineer.
- B. The backs of thrust block anchors shall be placed against undisturbed earth. The sides of thrust blocks shall be formed. Minimum bearing area shall be as called out on the Drawings or as determined by the Engineer. Felt roofing paper shall be placed to protect pipe joints. Concrete shall not be placed over bolts or nuts, or to prevent the removal of joints.

3.05 GROUTING

- A. Perform grouting as shown and elsewhere as required.

3.06 SEALANT

- A. Sealant shall be installed in clean recesses at the locations shown. The application of the sealant shall conform to all the manufacturer's recommendations including temperature, moisture, primer, primer cure time and joint and recess preparation. Masking tape shall be applied to each side of the joint prior to the installation of the sealant and removed afterwards along with any spillage to leave a sealant installation with straight edges and a neat orderly appearance. Gray colored sealants shall be used unless otherwise specified as shown.

3.07 BONDING COMPOUND

- A. Bonding compound shall be applied to the locations shown. The application of the bonding compound shall conform to all manufacturer's recommendations.

3.08 PREMOLDED JOINT FILLER

- A. Premolded joint fillers shall be installed at all locations shown.

3.09 BOND BREAKER

- A. Bond breakers shall be provided at the locations shown. Bond breaker tape shall be used at joints to separate the sealant from premolded joint filler and to separate the sealant from concrete at the bottom of the sealant. Tape for these installations shall be the same width as the joint or sealant recess.

3.10 MISCELLANEOUS WORK

- A. All bolts, anchors, miscellaneous metals or other sleeve steel work required to be set in the concrete forms for attachment of masonry, structural and mechanical equipment shall be set or installed under this Division. Be fully responsible for the setting of such materials, in the forms and shall correct all such not installed in a proper location or manner at his own expense.

- B. Electric conduits shall be installed in the concrete as required by the Drawings and as specified herein. Outlet boxes and fixtures shall be located in reference to the final floor, wall or ceiling finish and shall be so secured that they will not be displaced by concrete placing.
- C. Pipes or conduits for embedment, other than those merely passing through shall not be larger in outside diameter than $\frac{1}{3}$ the thickness of the slab, wall or beam in which they are embedded, unless indicated on the Drawings, nor shall they be spaced closer than 3 diameters on center, nor so located as to unduly impair the strength of the construction. The Engineer shall approve the location of all conduits and fixtures.

END OF SECTION