If you have printed this bid from the City of Quincy’s Website or through an email, it is your responsibility to check for addenda at www.quincyma.gov before you turn in your proposal. “Please send an acknowledgment that you have printed out this bid via email to; kimtrillcott@quincyma.gov” The City of Quincy will not be responsible for any bids received omitting any addenda acknowledgement. Thank you
City of Quincy, MA

FY19 Water Main Contract 1
February 2019

Bidding Requirements, Bond Forms, Contract Agreement, Conditions of the Contract and Technical Specifications

Thomas P. Koch – Mayor
Al Grazioso – Public Works Commissioner
Kathryn R. Logan – Purchasing Agent

Professional Registration No.: 46470
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NOTICE TO BIDDERS
CITY OF QUINCY, MASSACHUSETTS
FY19 WATER MAIN CONTRACT 1

The City of Quincy, Massachusetts, acting through its Department of Public Works invites sealed bids for "City of Quincy, Massachusetts, FY19 Water Main Contract 1", in accordance with the Contract Documents prepared by BETA GROUP, INC., Consulting Engineers, 315 Norwood Park South, Norwood, Massachusetts, 02062.

Bids will be received at the office of the: Purchasing Agent
Quincy City Hall
1305 Hancock Street
Quincy, MA 02169

until 11:30 A.M. local time on February 28, 2019, at which time and place, said Bids will be publicly opened and read aloud.

The location, general characteristics, and principal details of the Work are indicated in a set of drawings, entitled "City of Quincy, Massachusetts, FY19 Water Main Contract 1".

The work in this Contract includes, but is not limited to, the construction of approximately 11,000 linear feet of water mains and appurtenant work associated therewith in the City of Quincy, MA.

Bids shall be on a Unit Price basis.

Bid Security: Certified, treasurer's or cashier's check or bid bond in the sum of five (5) percent of the Total Bid is required.

Time for Completion for this project shall be 210 consecutive calendar days from the date stipulated in the Notice to Proceed to commence the Work.

Sets of Bidding Documents may be examined at the at the Issuing Office beginning on February 14, 2019, from 8:30 a.m. to 4:30 p.m., Monday through Friday.

Issuing Office: Office of the Purchasing Agent
Quincy City Hall
1305 Hancock Street
Quincy, MA 02169

Sets of Bidding Documents may be obtained: electronically at no cost by registering at:
https://www.quincyma.gov/govt/depts/purchasing/current_bids.htm

Bidders shall send a confirming email to “purchasing@quincyma.gov” to allow Owner to maintain a plan holders list. If Bidding Documents are downloaded and/or printed from Owner’s website, it is Bidder’s responsibility to check the website for any addenda before submitting a Bid. The Owner will not be responsible for any Bid that omits addenda acknowledgement. Note: the “Standard General Conditions of the Construction Contract
(CH.30-39m)” on the Owner’s website are superseded by the General Conditions included in these Bidding Documents.

and

**in hardcopy from Issuing Office**, beginning on February 14, 2019, 8:30 a.m. to 4:30 p.m. Mondays through Friday for a refundable deposit for each set of Bidding Documents of $100 payable by check or money order to City of Quincy, which deposit will be refunded to each document holder of record who returns a complete set of Bidding Documents in unused condition within 10 days after opening of Bids.

Anyone returning the hard copy of Contract Documents within 30 calendar days of receipt of Bid and in good condition will be refunded his deposit. After the 30-calendar day period, all deposits will be forfeited regardless of whether the individual was a Bidder or not.

A pre-bid conference will be held on February 20, 2019, at 9:00 AM, local time at the Department of Public Works, 55 Sea Street, Quincy, MA 02169. Attending the pre-bid conference is not required to submit a bid.

Refunds will only be provided for returned plans **and** specifications within 30 days of the bid.

Direct all inquiries to Andrew Dennehy, PE, Associate, BETA Group, Inc., 781-255-1982.

All Bids for this project are subject to applicable bidding laws of Massachusetts, including General Laws Chapter 30, Section 39M as amended.

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

Bid security in the amount of 5 percent of the Bid must accompany the Bid in accordance with the Instructions to Bidders. Contractors and Subcontractors shall make positive efforts to achieve: (1) a minority employee work force goal of 15.30 percent, (2) a woman employee work force goal of 6.90 percent, (3) a goal of 7.24 percent participation of Minority-owned Business Enterprise(s), and (4) a goal of 3.60 percent participation of Woman-owned Business Enterprise(s) within the Project contracts to satisfy MWRA funding requirements.

Minimum wage rates as issued by the Director of the Executive Office of Labor and Workforce Development, Department of Labor Standards under the provisions of Massachusetts General Laws, Chapter 149, Sections 26 to 27D inclusive, as amended, apply to this Project. It is the responsibility of the Bidders, before Bid opening, to request if necessary, any additional information on Minimum Wage Rates for those trades people who may be employed for the proposed Work under the resulting Contract. The successful Bidder must furnish 100 percent Performance and Labor and Materials Bonds.

The Owner and Engineer, being considered the sole and only judge, reserves the right to waive any informality in, or to reject, any or all bids, should the Owner deem it to be in the owner's best interest to do so.

City of Quincy, Massachusetts,
Department of Public Works

NOTICE TO BIDDERS 00100-2 Project 6345-2/8/2019
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1.02 Location and Work to be Done
1.03 Contract Documents
1.04 Payments for Drawings and Documents
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### 1.01 RECEIPT AND OPENING OF BIDS

A. The City of Quincy, Massachusetts, herein called the Owner, acting through its Department of Public Works, invites sealed bids for "City of Quincy, Massachusetts, FY19 Water Main Contract 1", in accordance with the Contract Documents prepared by BETA Group, Inc., Consulting Engineers, 315 Norwood Park South, Norwood, Massachusetts, 02062.

B. Such Bids, submitted in sealed envelopes plainly marked in the upper left hand corner with the Bidder’s name and address, plainly marked in the lower left hand corner with the date and time of opening, addressed to:
C. The Owner may consider informal, any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities in or reject any and all Bids. Conditional or qualified Bids will not be accepted. Any Bid received after the time and date specified shall not be considered. Should there be reasons why the Contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the Bidder.

1.02 LOCATION AND WORK TO BE DONE

A. The location, general characteristics, and principal details of the Work are indicated in a set of drawings, entitled "City of Quincy, Massachusetts, FY19 Water Main Contract 1".

B. The Drawings listed above are the Contract Drawings, sometimes referred to herein as the "Drawings".

C. Additional drawings showing details in accordance with which the Work is to be done will be furnished from time to time by the Engineer, if found necessary, and shall then become part of the Drawings.

D. The Contractor shall furnish all labor, services, materials, equipment, plant machinery, apparatus, appliances, tools, supplies and all other things necessary to perform all work required for the completion of each item of the Work and as herein specified.

E. The Work to be done and paid for under any item shall not be limited to the exact extent mentioned or described, but shall include all incidental work necessary or customarily done for the completion of that item.

1.03 CONTRACT DOCUMENTS

A. Sets of Bidding Documents may be examined at the at the Issuing Office beginning on February 14, 2019, from 8:30 a.m. to 4:30 p.m., Monday through Friday.

   Issuing Office:
   Office of the Purchasing Agent
   Quincy City Hall
   1305 Hancock Street
   Quincy, MA 02169

B. Sets of Bidding Documents may be obtained:
electronically at no cost by registering at:
https://www.quincyma.gov/govt/depts/purchasing/current_bids.htm

Bidders shall send a confirming email to “purchasing@quincyma.gov” to allow Owner to maintain a plan holders list. If Bidding Documents are downloaded and/or printed from Owner’s website, it is Bidder’s responsibility to check the website for any addenda before submitting a Bid. The Owner will not be responsible for any Bid that omits addenda acknowledgement. Note: the “Standard General Conditions of the Construction Contract (CH.30-39m)” on the Owner’s website are superseded by the General Conditions included in these Bidding Documents.

and

in hardcopy from Issuing Office, beginning on February 14, 2019, 8:30 a.m. to 4:30 p.m. Mondays through Friday for a refundable deposit for each set of Bidding Documents of $100 payable by check or money order to City of Quincy, which deposit will be refunded to each document holder of record who returns a complete set of Bidding Documents in unused condition within 10 days after opening of Bids.

1.04 QUESTIONS REGARDING DRAWINGS AND DOCUMENTS

A. In general, no answer will be given to prospective bidders in reply to an oral question of the intent or meaning of the Drawings or other Contract Documents, or the equality or use of products or methods other than those designated or described on the Drawings or in the Specifications. Any information given to bidders other than by means of the Drawings and other Contract Documents, including Addenda, as described below, is given informally, for information and the convenience of the bidder only and is not guaranteed. The bidder agrees that such information shall not be used as the basis of nor shall the giving of any such information entitle the bidder to assert any claim or demand against the Owner or the Engineer on account thereof.

B. To receive consideration, such questions shall be submitted in writing or faxed to the Engineer (for this purpose, BETA Group, Inc., 315 Norwood Park South, Norwood, Massachusetts, 02062 , Telephone No. (781) 255-1982, Fax No. (781) 255-1974 at least seven calendar days before the established date for receipt of Bids. If the question involves the equality or use of products or methods, it must be accompanied by drawings, specifications or other data in sufficient detail to enable the Engineer to determine the equality or suitability of the product or method. In general, the Engineer will neither approve nor disapprove particular products prior to the opening of Bids; such products will be considered when offered by the Contractor for incorporation into the Work.

C. The Engineer will set forth as Addenda, which shall become a part of the Contract Documents, such questions received as above provided as in his sole judgment are appropriate or necessary and his decision regarding each. At least two (2) days prior to the receipt of Bids, he will send a copy of these Addenda to those prospective bidders known to have taken out sets of the Drawings and other Contract Documents.

D. The Contractor agrees to use the products and methods designated or described in the Specifications as amended by the Addenda.
1.05 PRE-BID CONFERENCE

A. A pre-bid conference advising bidders of bid conditions will be held on February 20, 2019, at 9:00 AM, local time at the Department of Public Works, 55 Sea Street, Quincy, MA 02169.

B. Attending the Pre-bid conference is not required to submit a bid.

1.06 BIDDERS TO INVESTIGATE

A. Bidders are required to submit their Bids upon the following express conditions, which shall apply to and be deemed a part of every Bid received, viz.:

B. Bidders must satisfy themselves by personal examination of the Work and by such other means as they may wish, as to the actual conditions there existing, the character and requirements of the Work and difficulties attendant upon its execution, and the accuracy of all estimated quantities stated in the Bid.

1.07 INFORMATION NOT GUARANTEED

A. All information given on the Drawings or in the other Contract Drawings 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 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 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 or the 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 of other structures actually encountered during the construction work, except as may otherwise be expressly provided for in the Contract Documents.

1.08 CONDITIONS OF WORK

A. Each bidder must inform himself fully of the conditions relating to the construction and labor under which the work is now or will be performed; failure to do so will not relieve the successful bidder of his obligation to furnish all materials and all labor necessary to carry out the provisions of the Contract Documents and to complete the contemplated Work for the consideration set forth in his bid. Insofar as possible, the Contractor, in the carrying out of his work, shall employ such methods or means as will not cause any interruption of or interference with: the operation of the existing sewer; traffic; use of existing facilities and utilities; locations of existing utilities and structures affecting the work or other similar conditions at the site; character of equipment and facilities needed preliminary to and during prosecution of the work; requirements of owners and controlling authorities, having jurisdiction over the various lands, existing structures, facilities, and utilities; and all other conditions affecting the work to be done, and the labor and materials needed; and he shall
make his bid in sole reliance thereon; and shall not, at any time after submission of a bid, assert that there was any misunderstanding in regard to the nature or amount of the work to be done.

1.09 BLANK FORM FOR BID

A. Each bid must be submitted on the prescribed form, accompanied by the Bid Security and any other requested information. All blank spaces for bid prices must be filled in, in ink or typewritten, both in words and numerical figures, and be signed by the bidder with his business address and place of residence. Where both written words and numerical figures are given, the written words shall apply in the event of conflict. All bids shall be prepared in conformity with, and based upon and submitted subject to, all requirements of the Specifications and Drawings, together with all addenda thereto.

B. Bidders shall remove and submit the Bid pages (section 00300) and Bid Bond pages (Section 00400) only. All pages shall be correctly assembled, and submitted in accordance with Section 00100. All erasures or other changes in the Bid must be properly initialed by an authorized representative of the Bidder.

1.10 WITHDRAWAL OF BIDS

A. Except as hereinafter in this subsection otherwise expressly provided, once his Bid is submitted and received by the Owner for consideration and comparison with other bids similarly submitted, the bidder agrees that he may not and will not withdraw it within Ninety (90) consecutive calendar days after the actual date of the opening of Bids.

B. Upon proper written request and identification, Bids may be withdrawn only as follows:

1. At any time prior to the designated time for the opening of Bids.

2. Provided the Bid has not theretofore been accepted by the Owner, at any time subsequent to the expiration of the period during which the bidder has agreed not to withdraw his Bid.

C. Unless a Bid is withdrawn as provided above, the bidder agrees that it shall be deemed open for acceptance until the AGREEMENT has been executed by both parties thereto or until the Owner notifies a bidder in writing that his Bid is rejected or that the Owner does not intend to accept it, or returns his Bid deposit. Notice of acceptance of a Bid shall not constitute rejection of any other Bid.

1.11 BID SECURITY

A. Each bid must be accompanied by a certified check, treasurer's check or cashier's check issued by, a responsible bank or trust company and payable to the order of the Owner, or by a bid bond prepared on the form of BID BOND attached hereto duly executed and acknowledged by the bidder, as Principal, and by a surety company qualified to do business in the State of Massachusetts and satisfactory to the Owner, as Surety. The check or bid bond shall be in the sum of five (5) percent of the total bid and shall be enclosed in the sealed envelope containing the Bid.
B. Each such check or bid bond may be held by the Owner as security for the fulfillment of the bidder's agreements as hereinabove set forth and as set forth in the BID. Should the bidder fail to fulfill such agreements, his bid check shall become the property of the Owner or if a bid bond was furnished, the bid bond shall become payable to the Owner, as liquidated damages; otherwise, the bid check shall be returned to the bidder as hereinafter provided, or if the security is a bid bond, the bid bond shall become null and void.

C. Bid checks will be returned to all except the three lowest bidders within five days, Sundays and legal holidays excluded, after the opening of Bids, and to the three lowest bidders within five days, Sunday and legal holidays excluded, after the Owner and the accepted bidder have executed the AGREEMENT. In the event that the AGREEMENT has not been executed by both the accepted bidder and the Owner within 90 consecutive calendar days after the opening of Bids, the bid check will be returned promptly upon demand of any bidder who has not been notified of the acceptance of his Bid.

D. Bid checks accompanying Bids, which are rejected, will be returned within five days, Sundays and legal holidays excluded, after rejection.

E. None of the three lowest Bids shall be deemed rejected, notwithstanding acceptance of any Bid, until the AGREEMENT has been executed by both the Owner and the accepted bidder.

1.12 INTERESTED PARTIES TO CONTRACT

A. The undersigned declares; that the only person interested this Bid as principals are named herein as such; that no official of the Owner and no person acting for or employed by the Owner is interested directly or indirectly in this Bid, or in any contract which may be made under it, or in any expected profits to arise therefrom; that this Bid is made in good faith, without fraud, collusion or connection with any other person bidding or refraining from bidding for the same work; that he has examined carefully the said instructions and all other documents bound herewith and the Contract Drawings relating to the Contract covered by this Bid and hereby makes them part of this Bid; that he has informed himself fully in regard to all conditions pertaining to the work and place where it is to be done; and that he has made his own examination and carefully checked his estimates for cost and from them makes this Bid.

1.13 ABILITY AND EXPERIENCE OF BIDDER

A. No award will be made to any bidder who cannot satisfy the Owner that he has sufficient ability and experience in this class of work and sufficient capital and plant to enable him to prosecute and complete the Work successfully within the time named. The Engineer and the Owner may make such investigation as they deem necessary to determine the ability of the bidder to perform the work; and the bidder shall furnish to the Engineer and the Owner all such information and data for this purpose as the Engineer and the Owner may request.

B. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the Contract and to complete the Work contemplated therein within the time stated. The Owner's decision or judgment on these matters shall be final, conclusive, and binding for all parties involved.
1.14 BIDS

A. The Owner reserves the right to waive any informalities in, or to reject any or all Bids which in its sole judgment are either incomplete, conditional, obscure, or not responsive or which contain additions not called for, erasures not properly initialed, alternative, or similar irregularities, or the Owner may waive such omissions, conditions, or irregularities as he may feel appropriate.

B. Conditional bids will not be accepted. Bidder(s) will be disqualified if more than one proposal is received from an individual, firm, partnership, corporation or association, under the same or different names and such proposals will not be considered.

C. The Owner reserves the right to reject any or all Bids, should the Owner deem it to be in the public interest to do so.

1.15 COMPARISON OF BIDS

A. Bids will be compared on the basis of the experience and competence of the bidders and on the basis of the totals of the quantities listed in the proposal under the enumerated items at the unit prices or lump sums bid for these items. The Contract will be awarded to the lowest responsive, responsible and eligible bidder as determined by the Owner and/or its authorized representatives or agents. However, the Owner may reject any and all bids if it is in the public interest to do so.

B. The term, "Lowest responsive, responsible and eligible bidder," shall mean the bidder whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the Work; who shall certify 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.

C. Bids should be made on each separate item of work shown in the bid (proposal) with reasonable relation to the probable cost of doing the work included in such items. The Owner reserves the right to reject, wholly, any bid on which an item or items thereof are obviously unbalanced or appear to the Owner to be so unbalanced as to affect or to be liable to affect adversely any interests of the Owner. The attention of the bidder is called to the fact that unbalancing of bids may adversely affect the Contractor if certain portions for the Work are increased or decreased as provided in the Contract Documents.

D. A bidder shall state the proposed price for the work by which the bids will be compared. This price is to cover all the expenses incidental to the completion of the work in full conformity with the Contract, Specifications, and Drawings. In the event that there is a discrepancy between the unit prices and the extended totals, the unit prices shall govern. In the event that there is a discrepancy between the lump-sum or unit prices written in words and numerical figures, the prices written in words shall govern. No bid will be accepted which does not contain a unit price or lump sum as indicated for each of the applicable items enumerated in the proposal form.
1.16 ITEMS AND INDETERMINATE ITEMS

A. The Work to be done under this Contract has been divided into parts or items to enable each bidder to bid on different portions of the work in accordance with his estimate of their cost and so that the actual quantity of work executed under each item may be paid for at the price bid for that particular item, even though such quantity is greater or less than the estimated quantity stated in the BID.

B. The quantities listed in the bid (proposal) are approximate. The Owner does not expressly or by implication represent that the actual amounts of work will even approximately correspond therewith, but does call particular attention to the uncertainty in the quantities of the work involved which cannot be predicted in advance. The work under certain items may be materially greater or less than those given in the Bid as may be necessary in the judgment of the Owner complete the work contemplated in the Contract. Attention is particularly called to the fact that the quantity of work to be done under some bid items may be largely dependent on subsurface ground conditions encountered and, therefore, the quantities of work to be done under the various items may vary substantially from the estimated quantities or may even be omitted.

C. Certain items in the BID cover classes of work of doubtful necessity or work for which it is impractical to estimate approximate quantities. Such items have been marked “Indeterminate”. Prices for certain of such items have been stipulated in advance by the Owner as stated in the BID.

D. Only such quantities of the respective items of work actually performed and accepted will be paid for. An increase or decrease in quantity for any item shall not be regarded as grounds for an increase or decrease in the bid prices.

1.17 REDUCTION IN SCOPE OF WORK

A. The Owner reserves the right to decrease the scope of the work to be done under this Contract and to omit any work in order to bring the cost within available funds. To this end, the Owner reserves the right to reduce the quantity of any items or omit all of any as set forth in the BID, either prior to executing the Contract or at any time during the progress of the Work. The Owner further reserves the right, at any time during the progress of the Work, to restore all or part of any items previously omitted or reduced. Exercise by the Owner of the above rights shall not constitute any ground or basis of claim for damages or for anticipated profits on the work omitted.

1.18 CONTRACT BONDS

A. The Bidder whose Bid is accepted agrees to furnish the Contract Bonds in the forms which follow in Section 00600, titled CONTRACT BONDS, each in the sum of the full amount of the Bid and/or Contract Price as determined by the Engineer, and duly executed and acknowledged by the said bidder as Principal and by a surety company qualified to do business under the laws of Massachusetts and satisfactory to the Owner, as Surety, for the faithful performance of the contract and payment for labor and materials. The premiums for such Bonds shall be paid by the Contractor.

B. Surety Companies executing the Contract Bonds must also appear on the U.S. Treasury Department's most current list of "Companies Holding Certificates of Authority as
Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Circular 570 (Amended) by the Audit Staff Bureau of Accounts.

1.19 POWER OF ATTORNEY

A. Attorneys-in-fact who sign Bid Bonds or Contract Bonds must file with each Bond a certified and effectively dated copy of their power of attorney.

1.20 EXECUTION OF AGREEMENT

A. The Bidder whose Bid is accepted will be required and agrees to duly execute the AGREEMENT and furnish the required CONTRACT BONDS within the time limit stated in the BID after notification that the AGREEMENT is ready for signature.

B. The Bidder whose Bid is accepted upon his failure or refusal to duly execute the AGREEMENT and furnish the required CONTRACT BONDS within the time limit stated in the BID, shall forfeit to the Owner as liquidated damages for such failure or refusal, the surety deposited with his BID.

1.21 INSURANCE CERTIFICATES

A. The Contractor will not be permitted to start any construction work until he has submitted certificates covering all insurances called for under that subsection of the AGREEMENT, titled "Insurance." The Contractor shall submit said certificates using the forms supplied by the Engineer under said subsection.

1.22 TIME FOR COMPLETION AND LIQUIDATED DAMAGES

A. The bidder must agree to commence work on or before the date specified in the written "NOTICE TO PROCEED" issued by the Owner, and/or Engineer acting on behalf of the Owner, and to fully complete the project within the time specified in Table A of the Agreement, after the date specified in the written "NOTICE TO PROCEED" as stipulated in Table A of the AGREEMENT. The bidder must further agree to pay as liquidated damages to the Owner, the sum as specified in Table A of the Agreement for each consecutive calendar day thereafter as hereafter provided in the AGREEMENT.

1.23 LAWS AND REGULATIONS

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

1.24 WORK ON STATE, MUNICIPAL, AND PRIVATE PROPERTY

A. Particular attention is hereby directed to the fact that portions of the Work included under this Contract will be done within the limits of properties that are State-owned, municipal-owned, or privately owned. The Contractor shall be responsible for coordinating the prosecution of the Work of this Contract with the property owner and for providing work in accordance with any additional requirements as specified herein.
1.25 DATUM OR LEVELS

A. The figures given in the Contract and Specifications or upon the Drawings after the word elevation shall mean the distance in feet above mean sea level, the base of the State of Massachusetts and the United States Geodetic Survey (U.S.G.S.).

1.26 STATE SALES AND USE TAX

A. Materials and equipment purchased for installation under this Contract are exempt from Massachusetts Sales Tax. The Contractor shall file for exemption on behalf of the Owner with the State of Massachusetts Department of Taxation as required by law. The exemption from the Sales Tax shall be taken into account by the Contractor during bidding.

1.27 MANUFACTURER'S EXPERIENCE

A. Wherever it may be written that an equipment manufacturer must have a specified period of experience with his product, equipment which does not meet the specified experience period may be considered by the Owner and/or Engineer if the equipment supplier or manufacturer is willing to provide a sufficient bond or cash deposit as determined by the Owner and/or Engineer for the duration of the specified time period which will guarantee full replacement of that equipment in the event of failure at no additional cost to the Owner.

1.28 PROTECTION OF LIVES AND HEALTH

A. The project is subject to all of the Safety and Health Regulations as promulgated by the United States Department of Labor (Title 29, Part 1926/1910 CFR, and all revisions and amendments to date); the Contract Work Hours and Safety Standards Act (40 U.S.C. 327 et seq.) as supplemented by the Department of Labor Regulations (Title 29 CFR Part 5); and OSHA 2207, and all revisions and amendments to date. Contractors are urged to make themselves familiar with the requirements of these regulations.

1.29 NONDISCRIMINATION IN EMPLOYMENT

A. Contracts for work under this bid (proposal) will obligate the Contractors and subcontractors not to discriminate in employment practices.

B. The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, handicap, or national origin. The Contractor shall take affirmative action to ensure that applicants are employed and the employees are treated during employment without regard to their race, color, religion, sex, age, handicap, or national origin. Such actions shall include, but not be limited to, the following: employment, upgrading; demotions, or transfers; recruitment or recruitment advertising, layoffs, or terminations; rates of pay or other forms of compensation; selection for training including apprenticeship; and participation in recreational and education activities. The Contractor agrees to post in conspicuous places available to employees and applicants for employment notice to be provided setting forth the provisions of this non-discrimination clause. The Contractor will in all solicitations or advertisements for employees placed by or on behalf on the Contractor state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age, handicap or national origin. The Contractor will cause the foregoing provisions to be inserted in all sub-contracts for any work covered by
this Contract so that such provisions will be binding upon each sub-contractor and upon sub-contracts for standard commercial supplies or raw materials.

C. The Contractor shall keep such records and submit such reports concerning the racial and ethnic origin of applicants for employment and employees as the Owner may require as consistent with Federal and State law. The Contractor agrees to comply with such rules, regulations, or guidelines as the State of Massachusetts may implement these requirements. The Contractor further warrants that he will comply with the President's Executive Order No. 11246 or any preceding similar Executive Order relating thereto.

D. Bidders and Contractors must, if required, submit a compliance report (EPA Form 5720-4) concerning their employment practices and policies in order to maintain their eligibility to receive award of the Contract.

E. Successful bidders and Contractors must, if required, submit a list of all Subcontractors who will perform work on the project, and written signed statements from authorized agents of labor pools with which they will or may deal for employees on the work, together with any information to the effect that such labor pools' practices or policies are in conformity with said Executive Order that they will affirmatively cooperate in or offer no hindrance to the recruitment, employment, and equal treatment of employees seeking employment and performing work under this Contract; or a certification as to when such agents or labor pools have failed or refused to furnish them, prior to award of the Contract.

F. The successful bidder will be required to comply with Equal Opportunity Requirements and to abide by the prevailing wage rates for Public Work Projects for all employees on the job. It is the responsibility of Bidders to inform themselves as to the local labor conditions, overtime compensation, health and welfare contributions, labor supply and prospective changes or adjustment of wage rates. Information is available at the Office of Labor and Workforce Development.

G. Contractors and Subcontractors shall make positive efforts to achieve: (1) a minority employee work force goal of 15.30 percent, (2) a woman employee work force goal of 6.90 percent, (3) a goal of 7.24 percent participation of Minority-owned Business Enterprise(s), and (4) a goal of 3.60 percent participation of Woman-owned Business Enterprise(s) within the Project contracts to satisfy MWRA funding requirements.

1.30 SEQUENCE OF OPERATIONS

A. The Contractor must submit to the Engineer within fourteen (14) calendar days after execution of the Contractor Documents, a sequence of operations, giving detailed plans and schedules of his operation including any elements for by-pass pumping and/or flow diversion during the Work. Said sequence of operations shall be reviewed and must be approved by the Owner and Engineer prior to the start of the Work. The Owner reserves the right to limit or, if found necessary and/or required, delay construction, or certain activities thereof, in certain areas of the Contract should the Owner deem it to be in the public's best interest to do so.

B. The Contractor shall have no claim for additional compensation or damage on account of any such delays and/or required sequence of operations.
C. The Contractor shall maintain uninterrupted utility services at all times, and plan his work accordingly.

D. The Contractor shall coordinate his activities with any other contract and/or contractor to complete the Work as detailed on the Plans and Specifications.

1.31 WETLANDS AND WATERWAYS

A. The Contractor's attention is directed to the fact that a portion of the work is located within and/or immediately adjacent to wetlands and waterways. Work within these areas is subject to the jurisdiction of the Massachusetts Department of Environmental Protection. All requirements and/or control measures deemed necessary by the Department shall be strictly adhered to throughout the duration of this Contract.

B. The Contractor shall not have or assert any claim for nor shall he be entitled to any additional compensation or damages on account of requirements set forth by the Department of Environmental Protection regarding the wetlands and waterways encountered during construction.

1.32 MATERIAL PRICE ADJUSTMENT

A. This contract is subject to the requirements of Massachusetts General Law c30 s38A, Price adjustment clause in contracts for road, bridge, water and sewer projects awarded under Sec. 39M.

END OF SECTION
SECTION 00300

BID

To the City of Quincy, Massachusetts, herein called the "Owner", for "City of Quincy, Massachusetts, FY19 Water Main Contract 1".

The Undersigned, as a bidder herein referred to as singular and masculine, declares as follows:

(1) The only parties interested in this BID as Principals are named herein;

(2) this BID is made without collusion with any other person, firm, or corporation;

(3) no officer, agent, or employee of the Owner is directly or indirectly interested in this BID;

(4) he has carefully examined the site of the proposed Work and fully informed and satisfied himself as to the conditions there existing, the character and requirements of the proposed Work, the difficulties attendant upon its execution and the accuracy of all estimated quantities stated in this BID, and he has carefully read and examined the Drawings, the annexed proposed AGREEMENT and the Specifications and other Contract Documents therein referred to and knows and understands the terms and provisions thereof;

(5) he understands that information relative to subsurface and other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) has been furnished only for his information and convenience without any warranty or guarantee, expressed or implied, that the subsurface and/or other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) actually encountered will be the same as those shown on the Drawings or in any of the other Contract Documents and he agrees that he shall not use or be entitled to use any such information made available to him through the Contract Documents or otherwise or obtained by him in his own examination of the site, as a basis of or ground for any claim against the Owner or the Engineer arising from or by reason of any variance which may exist between the aforesaid information made available to or acquired by him and the subsurface and/or other conditions, natural phenomena, existing pipes and other structures (surface and/or subsurface) actually encountered during the construction work, and he has made due allowance therefore in this BID;

(6) and he understands that the quantities of work tabulated in this BID or indicated on the Drawings or in the Specifications or other Contract Documents are only approximate and are subject to increase or decrease as deemed necessary by the Engineer; and he agrees that, if this BID is accepted he will contract with the Owner, as provided in the copy of the Contract Documents deposited in the office of the Engineer, this BID form being part of said Contract Documents, and that he will perform all the work and furnish all the materials and equipment, and provide all labor, services, plant, machinery, apparatus, appliances, tools, supplies and all other things required by the Contract Documents in the manner and within the time therein prescribed and according to the requirements of the Engineer as therein set forth, and that he will take in full compensation therefore the total dollar amount tabulated from the actual measured quantities of said work and each unit or lump sum price stated in this BID as hereinafter set forth.

(Note: All entries in the entire BID must be made clearly and in ink; price bid must be written in both words and figures.)
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Brief Description; Unit or Lump-Sum Price Bid in Both Words and Figures</th>
<th>Estimated Quantity</th>
<th>Total in Figures</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Water Main</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1a</td>
<td>Furnish and Install 12-inch cement-mortar lined, ductile iron water main, per linear foot</td>
<td>300 lin. ft.</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>and ___________ cents ($_________).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1b</td>
<td>Furnish and Install 8-inch cement-mortar lined, ductile iron water main, per linear foot</td>
<td>11,000 lin. ft.</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>and ___________ cents ($_________).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1c</td>
<td>Furnish and Install 6-inch cement-mortar lined, ductile iron water main, per linear foot</td>
<td>200 lin. ft.</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>and ___________ cents ($_________).</td>
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<td></td>
</tr>
<tr>
<td>2</td>
<td><strong>Valves</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2a</td>
<td>Furnish and Install 12-inch gate valve, including valve box, per valve</td>
<td>12 valve</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>and ___________ cents ($_________).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2b</td>
<td>Furnish and Install 8-inch gate valve, including valve box, per valve</td>
<td>85 valves</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>and ___________ cents ($_________).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2c</td>
<td>Furnish and Install 6-inch gate valve, including valve box, per valve</td>
<td>2 valves</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>and ___________ cents ($_________).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2d</td>
<td>Remove existing gate valve boxes, per box</td>
<td>25 boxes</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>and ___________ cents ($_________).</td>
<td></td>
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<tr>
<td>3</td>
<td><strong>Insertion Valves</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3a</td>
<td>Furnish and Install 12-inch insertion valve, including valve box, per valve</td>
<td>2 valves</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>and ___________ cents ($_________).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3b</td>
<td>Furnish and Install 8-inch insertion valve, including valve box, per valve</td>
<td>3 valves</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>and ___________ cents ($_________).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3c</td>
<td>Furnish and Install 6-inch insertion valve, including valve box, per valve</td>
<td>3 valves</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>and ___________ cents ($_________).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item No.</td>
<td>Brief Description; Unit or Lump-Sum Price Bid in Both Words and Figures</td>
<td>Estimated Quantity</td>
<td>Total in Figures</td>
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<tr>
<td>---------</td>
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</tr>
<tr>
<td>4</td>
<td>Line Stops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4a</td>
<td>Furnish and Install 12-inch line stop,</td>
<td>3</td>
<td>$__________</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>stops</td>
</tr>
<tr>
<td></td>
<td></td>
<td>_________________</td>
<td>dollars and ______ cents ($_______)</td>
</tr>
<tr>
<td>4b</td>
<td>Furnish and Install 8-inch line stop,</td>
<td>3</td>
<td>$__________</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>stops</td>
</tr>
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<td></td>
<td></td>
<td>_________________</td>
<td>dollars and ______ cents ($_______)</td>
</tr>
<tr>
<td>4c</td>
<td>Furnish and Install 6-inch line stop,</td>
<td>5</td>
<td>$__________</td>
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<td></td>
<td></td>
<td></td>
<td>stops</td>
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<tr>
<td></td>
<td></td>
<td>_________________</td>
<td>dollars and ______ cents ($_______)</td>
</tr>
<tr>
<td>5</td>
<td>Hydrants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5a</td>
<td>Furnish and Install hydrant assemblies,</td>
<td>32</td>
<td>$__________</td>
</tr>
<tr>
<td></td>
<td>complete with tee, gate valve, valve box,</td>
<td></td>
<td>hydrants</td>
</tr>
<tr>
<td></td>
<td>6” supply pipe, and fittings, per hydrant</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>_________________</td>
<td>dollars and ______ cents ($_______)</td>
</tr>
<tr>
<td>5b</td>
<td>Remove existing hydrant assembly and repair</td>
<td>26</td>
<td>$__________</td>
</tr>
<tr>
<td></td>
<td>area, per hydrant</td>
<td></td>
<td>hydrants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>_________________</td>
<td>dollars and ______ cents ($_______)</td>
</tr>
<tr>
<td>6</td>
<td>Service Connections</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6a</td>
<td>Replace existing service connections,</td>
<td>7,500</td>
<td>$__________</td>
</tr>
<tr>
<td></td>
<td>1-inch, from water main corporation to</td>
<td></td>
<td>lin. ft.</td>
</tr>
<tr>
<td></td>
<td>curb stop with copper tubing, per linear foot</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>_________________</td>
<td>dollars and ______ cents ($_______)</td>
</tr>
<tr>
<td>6b</td>
<td>Replace existing service connections,</td>
<td>150</td>
<td>$__________</td>
</tr>
<tr>
<td></td>
<td>1.5-inch and 2-inch, from water main</td>
<td></td>
<td>lin. ft.</td>
</tr>
<tr>
<td></td>
<td>corporation to curb stop with copper tubing,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>per linear foot</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>_________________</td>
<td>dollars and ______ cents ($_______)</td>
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<tr>
<td>7</td>
<td>Corporation and Curb Stops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7a</td>
<td>Furnish and Install corporation stops,</td>
<td>300</td>
<td>$__________</td>
</tr>
<tr>
<td></td>
<td>1-inch, per stop</td>
<td></td>
<td>stops</td>
</tr>
<tr>
<td></td>
<td></td>
<td>_________________</td>
<td>dollars and ______ cents ($_______)</td>
</tr>
<tr>
<td>7b</td>
<td>Furnish and Install corporation stops,</td>
<td>5</td>
<td>$__________</td>
</tr>
<tr>
<td></td>
<td>1.5-inch and 2-inch, per stop</td>
<td></td>
<td>stops</td>
</tr>
<tr>
<td></td>
<td></td>
<td>_________________</td>
<td>dollars and ______ cents ($_______)</td>
</tr>
<tr>
<td>Item No.</td>
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<td>Estimated Quantity</td>
<td>Total in Figures</td>
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<td>---------</td>
<td>-------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>7c</td>
<td>Furnish and Install curb stops, 1-inch, per stop</td>
<td>300</td>
<td>$_________ stops</td>
</tr>
<tr>
<td></td>
<td>and ____________ dollars and ____________ cents ($________)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7d</td>
<td>Furnish and Install curb stops, 1.5-inch and 2-inch, per stop</td>
<td>5</td>
<td>$_________ stops</td>
</tr>
<tr>
<td></td>
<td>and ____________ dollars and ____________ cents ($________)</td>
<td></td>
<td></td>
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<tr>
<td>8</td>
<td><strong>Temporary Service Bypass Piping</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8a</td>
<td>Furnish and install temporary bypass pipe, 4-inch diameter, with</td>
<td>11,500</td>
<td>$_________ lin. ft.</td>
</tr>
<tr>
<td></td>
<td>bypass ramp, per linear foot</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>____________ dollars and ____________ cents ($________)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8b</td>
<td>Furnish and install temporary bypass pipe, 2-inch, with bypass ramp,</td>
<td>9,400</td>
<td>$_________ lin. ft.</td>
</tr>
<tr>
<td></td>
<td>per linear foot</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>____________ dollars and ____________ cents ($________)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td><strong>Fire Services</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9a</td>
<td>Connection to existing fire service all sizes, per connection</td>
<td>5</td>
<td>$_________ connections</td>
</tr>
<tr>
<td></td>
<td>____________ dollars and ____________ cents ($________)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9b</td>
<td>Sprinkler system flow test, per test</td>
<td>5</td>
<td>$_________ tests</td>
</tr>
<tr>
<td></td>
<td>____________ dollars and ____________ cents ($________)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td><strong>Miscellaneous Earth Excavation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10a</td>
<td>Excavation of Unsuitable Materials, below normal grade, per cubic yard</td>
<td>1,000*</td>
<td>$_________ cu. yds.</td>
</tr>
<tr>
<td></td>
<td>____________ dollars and ____________ cents ($________)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10b</td>
<td>Excavation of Unsuitable Materials, above normal grade, per cubic yard</td>
<td>1,500*</td>
<td>$_________ cu. yds.</td>
</tr>
<tr>
<td></td>
<td>____________ dollars and ____________ cents ($________)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10c</td>
<td>Rock excavation and disposal, per cubic yard</td>
<td>500*</td>
<td>$_________ cu. yds.</td>
</tr>
<tr>
<td></td>
<td>____________ dollars and ____________ cents ($________)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Indeterminate; quantity assumed for comparison of bids.
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Brief Description; Unit or Lump-Sum Price Bid in Both Words and Figures</th>
<th>Estimated Quantity</th>
<th>Total in Figures</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Earth excavation and backfill for test pits, as directed, per cubic yard</td>
<td>150* cu. yds.</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>and ____________ cents ($________)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td><strong>Pavement Restoration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12a</td>
<td>Gravel base course, 16-in., per cubic yard</td>
<td>5,700 cu. yds.</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>___________________________________________________________________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12b</td>
<td>Trench width bituminous concrete binder course, 4-inch thickness, per ton</td>
<td>175 tons</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>___________________________________________________________________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12c</td>
<td>Trench width bituminous concrete surface Course, 2-inch thickness, per ton</td>
<td>95 tons</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>___________________________________________________________________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12d</td>
<td>Trench width temporary pavement (2-in.), as directed, per ton</td>
<td>1,800 tons</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>___________________________________________________________________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td><strong>Concrete</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13a</td>
<td>Additional concrete (all classes), per cubic yard</td>
<td>100* cu. yds.</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>___________________________________________________________________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13b</td>
<td>Flowable concrete fill, Type A, per cubic yard</td>
<td>550 cu. yds.</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>___________________________________________________________________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Additional crushed stone, as directed, per cubic yard</td>
<td>100* cu. yds.</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>___________________________________________________________________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Mobilization, the lump sum of</td>
<td>1 lump sum</td>
<td>$_________</td>
</tr>
<tr>
<td></td>
<td>___________________________________________________________________</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Contaminated Soil and Groundwater Allowance, Fifty Thousand dollars</td>
<td>1 allowance</td>
<td>$50,000.00</td>
</tr>
<tr>
<td></td>
<td>___________________________________________________________________</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Indeterminate; quantity assumed for comparison of bids.
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Brief Description; Unit or Item</th>
<th>Lump-Sum Price Bid in Both Words and Figures</th>
<th>Estimated Quantity</th>
<th>Total in Figures</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Allowance for Uniformed Trafficmen,</td>
<td>Two Hundred Twenty Thousand dollars and zero cents ($220,000.00)</td>
<td>1</td>
<td>$220,000.00</td>
</tr>
<tr>
<td>18</td>
<td>Private Property Plumbing and/or Residential Issues Allowance</td>
<td>Fifty Thousand dollars and zero cents ($50,000.00)</td>
<td>1</td>
<td>$50,000.00</td>
</tr>
<tr>
<td>19</td>
<td>Towable Variable Message Sign Boards, per board</td>
<td></td>
<td>2</td>
<td>$________</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$________</td>
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</tbody>
</table>

**Total BID in figures** $_____________________

**Total BID in words**
The undersigned agrees that for extra work, if any, performed in accordance with the terms and provisions of the annexed form of AGREEMENT, he will accept compensation as stipulated therein as full payment for such extra work.

If the Bid is accepted by the OWNER, the undersigned agrees to commence work under this Contract on a date to be specified in a written "Notice to Proceed" by the Owner and complete the entire work provided to be done under this Contract within the time stipulated in Table "A" of the AGREEMENT. If this bid is accepted by the Owner, the undersigned, also agrees to comply with the provisions of Section 1.14 “Liquidated Damages” and Table A of the Agreement.

As provided in the INFORMATION FOR BIDDERS, the bidder hereby agrees that he will not withdraw this BID, within 90 consecutive calendar days after the actual date of the opening of Bids, and that, if the Owner shall accept this BID, the bidder will duly execute and acknowledge the AGREEMENT and furnish, duly executed and acknowledged, the required CONTRACT BONDS within fourteen (14) consecutive calendar days after notification that the AGREEMENT and other Contract Documents are ready for signature.

Should the bidder fail to execute any of his agreements as hereinabove set forth, the Owner shall have the right to retain as liquidated damages, the Bid Security attached in the sum of

(5 percent of Total Bid)

_________________________________________________________ Dollars,

($________________________) which shall become the Owner's property for the delay and additional expense to the Owner caused thereby. If a bid bond was given, it is agreed that the amount thereof shall be paid as liquidated damages to the Owner by the Surety. (Bidder must fill in this blank.)

The bidder hereby acknowledges the receipt of, and has included in this BID, the following Addenda:

(To be filled in by Bidder, if Addendums are issues.)

Addendum No. ______________________, dated ______________________
Addendum No. ______________________, dated ______________________
Addendum No. ______________________, dated ______________________
The bidder, by submittal of this BID, agrees with the Owner that the amount of the bid security deposited with this BID fairly and reasonably represents the amount of damages the Owner will suffer due to the failure of the bidder to fulfill his agreements as above provided.

(SEAL) __________________________________ L.S.
(Name of Bidder)

By __________________________________________
(Signature and title of authorized representative)

___________________________________________
(Business address)

___________________________________________
(City and State)

Date _________________________________________

The bidder is a corporation incorporated in the State (or Commonwealth) of __________________—— a partnership — an individual. (Bidder must add and delete as necessary to make this sentence read correctly.)

(Note: If the bidder is a corporation, affix corporate seal and give below the names of its president treasurer, and general manager, if any; if a partnership, give full names and residential addresses of all partners; and if an individual, give residential address, if different from business address.)

The required names and addresses of all persons interested in the foregoing Bid, as Principals, are as follows:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

(Add supplementary page if necessary)
CERTIFICATE OF AUTHORIZATION
FOR
BIDDING REPRESENTATIVE

(Note: Bidder must complete for certification of authorized representative signing Bid.)

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

______________________________________ ____________________________________

(Name of Authorized Representative) (Title)

of this company shall be, and hereby is, authorized to execute bidding documents, contracts and bonds in

the name and on behalf of said company, and to affix the corporate seal thereto, and such execution of

any contract obligation in this company's name on its behalf of such

__________________ under seal of the company shall be valid and binding upon this company. (Title)

A true copy

ATTEST

(Clerk)

Place of Business ______________________________________________________________________

____________________________________________________________________________________

I hereby certify that I am the clerk of the _____________________________

(Name of Corporation)

________________________________________, that _________________________________________

(Name of Authorized Representative)

is the duly elected _____________________________ of said company, and that the

(Title)

above vote has not been amended or rescinded and remains in full force and effect as of the date of this

contract.

Corporate Seal

(Clerk)
STATEMENT OF BIDDERS' QUALIFICATIONS

The following shall accompany the bid and is required as evidence of the bidder's qualifications to perform the work, as bid upon, in accordance with the contract drawings and specifications. This statement must be notarized. All questions must be answered. Additional data may be submitted on separate attached sheets.

1. Name of Bidder

2. Permanent Main Office Address

3. Official Mailing Address For This Contract

4. When Organized?

5. Where Incorporated, If a Corporation

6. Years Contracting under Present Name

7. List contracts on hand, and those completed similar in nature to this kind of project.

<table>
<thead>
<tr>
<th>Owner</th>
<th>Engineer</th>
<th>Contract</th>
<th>Description</th>
<th>Contract Amount</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

8. List any work the firm has failed to complete, state where and why.

9. If you have ever defaulted on any contract, state where and why.
10. List full names and residences of all principals (i.e.: Officers, Directors, Partners, Owners) interested in this bid.

<table>
<thead>
<tr>
<th>Name</th>
<th>Residence</th>
<th>Title</th>
<th>Firm</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

11. State name(s) and qualifications of resident supervisor(s) for this project.

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

12. List major equipment available for this project and identify ownership or rental.

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

13. Will you furnish a detailed financial statement and other information, requested by the Owner?

14. List bank references for verifying financial ability of your company.

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>
15. The undersigned hereby authorized and requests any person, firm or corporation, to furnish all information requested by the Owner and/or its designated agents relative to the recitals comprising this Statement of the Bidder's Qualifications.

Dated at ___________ this __________ day of _________________________ 20______.

_______________________________________
(Name of Bidder)

By: ___________________________________

_______________________________________
(Title)

State of ____________________________

County of ___________________________

___________________________________ being duly sworn in person, deposes and says

that he is _______________________ of ___________________________________________________,

(TITLE) (Name of Bidder)

that he is the firm's duly authorized agent to execute these contract documents, and that the

answers to the foregoing questions and all statements therein contained are correct and true.

Subscribed and sworn to before me this _______________ day of ________________ 20______.

(SEAL)

(Notary Public)

(My Commission Expires)
STATEMENT OF PROPOSED SUBCONTRACTORS

The following shall accompany the bid and is required as evidence of the bidder's qualifications to perform the work as bid upon, in accordance with the contract drawings and specifications. The Bidder must state the names and appurtenant information of all major subcontractors he proposed to use to complete the work as bid upon. Additional data may be submitted on separate attached sheets.

If subcontractors are not to be used to complete the Work and/or any portion thereof, as herein bid upon, the Bidder must acknowledge by writing "NONE" ________________.

Bidder to insert description of work, percentage of Total BID, and subcontractors' names as may be required.

This is to certify that all names of the above-mentioned subcontractors are submitted with full knowledge and consent of the respective parties.
The Bidder warrants that none of the proposed subcontractors have any conflict of interest as respects this contract.

Date ________________________________ Bidder ________________________________
(Name of Bidder)

By ________________________________
(Signature)

_____________________________
(Title)

_____________________________
(Business Address)

_____________________________
(City and State)
LABOR HARMONY AND OSHA 10 CERTIFICATION

The undersigned certifies that they will conform to and provide documentation for the requirements as stated in MGL c. 30, §39S(a) as follows:

The bidder certifies 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; and 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 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; and 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 United States Occupational Safety and Health Administration that is at least 10 hours in duration.

Name of Contractor/Business

Signature of Authorized Representative of Contractor/Business

Date
CERTIFICATE OF NON - COLLUSION

Any person submitting a bid under this section shall, on such bid, certify the following: 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 paragraph the word “person” shall mean any natural person, joint venture, partnership, corporation, or other business, or legal entity.

___________________________________________________
Name of Contractor/Business

___________________________________________________
Signature of Authorized Representative of Contractor/Business

___________________________________________________
Date

TAX COMPLIANCE CERTIFICATION

Pursuant to MGL c. 62C, §49A, I certify under the penalties of perjury that, to the best of my knowledge and belief, I am in compliance with all laws of the Commonwealth relating to taxes, reporting of employees and contractors and withholding and remitting child support, and, subject to the conditions stated above, the contracting agency confirms with the Massachusetts Department of Revenue (DOR) that the person is in good standing with respect to all returns due and taxes payable to DOR as of the date of confirmation.

___________________________________________________
Name of Contractor/Business

___________________________________________________
Signature of Authorized Representative of Contractor/Business

___________________________________________________
Social Security or Federal Identification Number

___________________________________________________
Date
SECTION 00400

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we the undersigned (Insert Name of Bidder) ______ _____________________________, as Principal, and (Insert Name of Surety) _____________________________, as Surety, are hereby held and firmly bound and obligated unto the City of Quincy, Massachusetts, as Owner, in the sum of _____________________________ Dollars ($___________), as liquidated damages for payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

The condition of the above obligation is such that whereas the Principal has submitted to the City of Quincy, Massachusetts a certain Bid attached hereto and hereby made a part hereof, to enter into a contract in writing, hereinafter referred to as the "AGREEMENT" and/or "Contract", for "City of Quincy, Massachusetts, FY19 Water Main Contract 1".

NOW THEREFORE,

(a) If said BID shall be rejected or withdrawn as provided in the INFORMATION FOR BIDDERS attached hereto or, in the alternative,

(b) If said BID shall be accepted and the Principal shall duly execute and deliver the form of AGREEMENT attached hereto and shall furnish the specified bonds for the faithful performance of the AGREEMENT and/or Contract and for the payment for labor and materials furnished for the performance of the AGREEMENT and/or Contract,

then this obligation shall be void, otherwise it shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder in no event shall exceed the amount of this obligation.

The Surety, for value received, hereby agrees that the obligations of said Surety and its bond shall in no way be impaired or affected by any extensions of the time with which such BID may be accepted, and said Surety does hereby waive notice of any such extensions.
IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, have duly executed this bond on the _____________ day of __________________, 20 __________.

(SEAL) ___________________________________________ L.S.
(Name of Principal)

BY: ______________________________________________
(Signature)

______________________________________________
(Title)

______________________________________________
(Name of Surety) (Seal)

BY: ______________________________________________
(Signature and Title)

BY: ______________________________________________
Attorney-In-Fact

Sealed and delivered in the presence of:

______________________________________________

______________________________________________

IMPORTANT: Surety Companies executing BONDS must appear on the U.S. Treasury Department's most current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts and be authorized to transact business in the state where the PROJECT is located.

If the Bond is signed on behalf of the Surety by an Attorney-In-Fact, there should be attached, a duly certified copy of his power of attorney showing his authority to sign such Bond.
AGREEMENT

Made in Quintuplicate this day _______________ between the City of Quincy, Massachusetts, a Municipal Corporation, Within the County of Norfolk, party of the First Part and:

Party of the second part.

WITNESSETH: That for and in consideration of the following mutual covenants contained herein the parties Agree to as follows:

ARTICLE I: The party of the second part agrees to sell and deliver to the party of the first part the following:

FY19 Water Main Contract No. 1

TERMS: As per attached

SPECIFICATIONS ARE ATTACHED TO AND MADE A PART THEREOF

ORDERED BY: ________________________________

ARTICLE II: The party of the first part agrees to pay to the party of the second part upon satisfactory completion of the delivery of the above mentioned.

For the sum of: $__________________________

(AMOUNT WRITTEN IN WORDS)

Sufficient funds are available to cover this contract in the account to be charged.

________________________________________
MAYOR

________________________________________
DIRECTOR OF MUNICIPAL FINANCE

________________________________________
CITY DEPARTMENT HEAD

________________________________________
VENDOR SIGNATURE

________________________________________
CITY SOLICITOR

________________________________________
PURCHASING AGENT

________________________________________
DEPARTMENT #:

P.O. #:

CODE #:
THIS AGREEMENT, is executed this __________ day of _______________ in the year Two Thousand and Nineteen (herein referred to as the "AGREEMENT") by and between the City of Quincy, Massachusetts party of the first part, and ______________________________ (Name of Contractor) party of the second part.

WITNESSETH, that the parties to these presents, each in consideration of the undertakings, promises, and agreements on the part of the other herein contained, have undertaken, promised, and agreed and do hereby undertake, promise, and agree, the party of the first part for itself, its successors and assigns, and the party of the second part for himself and his heirs, executors, administrators, successors and assigns, as follows:

1.01 Definitions
1.02 The Contract Documents
1.03 Obligations and Liability of Contractor
1.04 Authority of the Engineer
1.05 Supervision of Work
1.06 Insurance
1.07 Patents
1.08 Compliance with Laws
1.09 Provisions Required by Law Deemed Inserted
1.10 Permits
1.11 Not to Sublet or Assign
1.12 Delay by Owner
1.13 Time for Completion
1.14 Liquidated Damages
1.15 Night, Saturday, Sunday and Holiday Work
1.16 Employ Competent Persons
1.17 Employ Efficient Labor and Equipment
1.18 Intoxicating Liquors and/or Drugs
1.19 Access to Work
1.20 Examination of Work
1.21 Defective Work, Etc.
1.22 Protection Against Water and Storm
1.23 Right to Materials
1.24 Changes
1.25 Extra Work
1.26 Extension of Time on Account of Extra Work
1.27 Changes Not to Affect Bonds

ADDENDA - Written or graphic instruments prior to the opening of Bids which Clarify, correct or change the Bidding Requirements or Contract Documents.

AGREEMENT - the written contract between Owner and Contractor covering the Work to be performed.

PERMITTED," or words of like import are used, it shall be understood that the direction, order, request, requirement, or permission of the Engineer is intended.

"APPROVED," "ACCEPTABLE," "SUITABLE," "SATISFACTORY," and words of like import shall mean approved by, acceptable to, suitable to, or satisfactory to the Engineer.

APPLICATION FOR PAYMENT - Form used by Contractor in requesting progress or final payments, format to be acceptable to the Engineer.

BID - The offer or proposal of the bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

BIDDER - Any person, firm or corporation submitting a bid for the work.

CHANGE ORDER - A document recommended by the Engineer, which is signed by the Contractor and Owner authorizing the addition, deletion or revision in the Work, or adjustment in the Contract Price or Contract Time, issued on or after the effective date of the Agreement.

CONTRACTOR - The person, firm or corporation with whom the Owner has entered into the Agreement.

Contract Bonds - Bid, Performance, and Labor and Materials Bonds and other instruments of security furnished by the Contractor and his surety in accordance with the Contract Documents.

CONTRACT DOCUMENTS - The Agreement, Addenda, Bid, Post Bid documentation submitted prior to the Notice Award, The Notice to Proceed, Bonds, General Conditions, Supplementary Conditions, The Specifications, the Drawings, all written Amendments, Change Orders, Field Orders, and Engineers written interpretations and clarifications.

CONTRACT PRICE - The total monies payable to the Contractor under the terms and conditions of the Contract Documents.

CONTRACT TIME - The number of calendar days stated in the Contract Documents for the completion of the Work.

CONSTRUCTION SUPERINTENDENT - That person designated by the Contractor to carry out the provisions of the Contract.

DATUM OR LEVELS - The figures given in the Contract and Specifications or upon the Drawings after the word elevation or abbreviation of it, shall mean the distance in feet above mean sea level, the base of the State in which the Work is located and the United States Geodetic Survey (U.S.G.S.).

DRAWINGS - The part of the Contract Drawings which show the characteristics and Scope of the Work to be performed and which have been prepared or approved by the Engineer.

EARTH - Wherever used as the name of an excavated material or material to be excavated, shall mean all kinds of material other than rock as defined in this section.

ELEVATION - The figures given on the Drawings or in the other Contract Documents after the word "elevation" or abbreviation of it shall mean the distance in feet above the datum adopted by the Engineer.

ENGINEER - The person, firm or corporation duly appointed by the Owner to undertake the duties and powers herein assigned to the Engineer, acting either directly or through duly authorized representatives.

(For this Contract, BETA Group, Inc.)

FIELD ORDER - A written order issued by the Engineer which orders minor changes in the Work which do not involve a change in the Contract Price or an extension of the Contract time.

GENERAL REQUIREMENTS - Sections of Division 1 of the Specifications.

"HEREIN," "HEREINAFTER," "HEREUNDER," and words of like import shall be deemed to refer to the Contract Documents.

NOTICE OF AWARD - The written notice of the acceptance of the Bid from the Owner to the successful Bidder.

NOTICE TO PROCEED - Written communication issued by the Owner to the Contractor authorizing him to proceed with the Work and establishing the date of commencement of the Work.

OWNER - The public body or authority, corporation, association, firm or person with whom the Contractor has entered into the Agreement and for whom the Work is to be provided.

PROJECT OR CONTRACT - The undertaking to be performed in the Contract Documents.

PROJECT REPRESENTATIVE - The authorized representative of the owner who is assigned to the project site or any part thereof.
ROCK - wherever used as the name of an excavated material to be excavated, shall mean only boulders and pieces of concrete and masonry exceeding 1 cu. yd. in volume, or igneous, sedimentary, metamorphic, and conglomerate rock which, in the opinion of the Engineer, requires, for its removal, drilling and blasting, wedging, sledging, barring, or breaking up with a power-operated tool. No soft or disintegrated rock which can be removed with a hand pick or power-operated excavator or shovel, no loose, shaken, or previously blasted rock or broken stone in rock fillings, or elsewhere, and no rock exterior to the maximum limits of measurement allowed, which may fall into the excavation, will be measured or allowed as "rock."

SHOP DRAWINGS - All drawings, diagrams, schedules and other data or information prepared for and submitted by the Contractor, to illustrate portions of the Work.

SPECIFICATIONS - The portions of the Contract documents consisting of written technical descriptions of materials, equipment, construction systems, standards and workmanship as applied to the Work and certain administrative details applicable thereto.

SUBCONTRACTOR - An individual, firm or corporation, approved by the Owner and Engineer having a direct contract with the Contractor or with any other Sub-Contractor for the performance of a part of the Work on the Project.

SUBSTANTIAL COMPLETION - Date certified by the Engineer when construction is sufficiently complete, in accordance with the Contract Documents, so the Owner can occupy or utilize the Work or designated portion thereof for which it was intended, as expressed in the Contract documents.

SUPPLEMENTARY CONDITIONS - The part of the Contract Documents which amends or supplements the General Conditions.

SUPPLIER - Any person or organization who supplies materials or equipment for the Work, including that fabricated to a special design, but who does not perform labor at the site.

WRITTEN NOTICE - Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed when posted by certified or registered mail to the said party at his last given address or delivered in person to said party or his authorized representative on the Work.

WORK - The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work includes and is the result of performing or furnishing labor and furnishing and incorporating materials and equipment into the construction, and performing or furnishing services and furnishing documents, all as required by the Contract Documents.

1.02 THE CONTRACT DOCUMENTS

A. The Contract Documents, as defined above, are sometimes herein referred to as the "Contract".

The Contract Documents are complementary, and what is called for by any one shall be as binding as if called for by all. In the event of any conflict or inconsistency between the provisions of the AGREEMENT and the provisions of any of the other Contract Documents, the provisions of the AGREEMENT shall prevail.

A. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the edition of the standard specification, manual, code or laws or regulations identified in the reference. In the event a particular edition is not identified, the reference shall mean the latest amended edition in effect at the time of receipt of the Bid. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall change the duties and responsibilities of the Owner, the Contractor or the Designer, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to the Engineer, or any of the Engineer's consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the work or any duty or authority to undertake responsibility contrary to the provisions of the AGREEMENT.

1.03 OBLIGATIONS AND LIABILITY OF CONTRACTOR

A. The Contractor shall do all the work and perform and furnish all the labor, services, materials, equipment, plant, machinery, apparatus, appliances, tools, supplies and all other things (except as otherwise expressly provided herein) necessary and as herein specified for the proper performance and completion of the Work in the manner and within the time hereinafter specified, in strict accordance with the Drawings, Specifications and other Contract Documents, in conformity with the directions and to the satisfaction of the Engineer, and at the prices herein agreed upon therefor.

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B. All parts of the Work and all fixtures, equipment, apparatus and other items indicated on the Drawings and not mentioned in the Specifications, or vice versa, and all work and material usual and necessary to make the work complete in all its parts, including all incidental work necessary to make it complete and satisfactory and ready for use and operation, whether or not they are indicated on the Drawings or mentioned in the Specifications, shall be furnished and executed the same as if they were called for both by the Drawings and by the Specifications.

C. The Contractor shall coordinate his operations with those of any other contractors who may be employed on other work of the Owner, shall avoid interference therewith, and shall cooperate in the arrangements for storage of materials and equipment.

D. The Contractor shall conduct his work so as to interfere as little as possible with private business and public travel. Wherever and whenever necessary or required, he shall maintain fences, furnish watchmen, maintain lights, and take such other precaution as may be necessary to protect life and property.

E. The Contractor shall indemnify and save harmless the Owner and the Engineer and their officers, agents, servants and employees, from and against any and all claims, demands, suits, proceedings, liabilities, judgments, awards, losses, damages, costs and expenses, including attorneys’ fees, on account of bodily injury, sickness, disease or death sustained by any person or persons or injury or damage to or destruction of any property, directly or indirectly arising out of, relating to or in connection with the Work, whether or not due or claimed to be due in whole or in part to the active, passive or concurrent negligence or fault of the Contractor, his officers, agents, servants or employees, any of his subcontractors, or any of their respective officers, agents, servants or employees and/or any other person or persons, and whether or not such claims, demands, suits or proceedings are just, unjust, groundless, false or fraudulent; and the Contractor shall and does hereby assume and agrees to pay for the defense of all such claims, demands, suits and proceedings, provided, however, that the Contractor shall not be required to indemnify the Engineer, his officers, agents, servants or employees, against any such damages occasioned solely by defects in maps, plans, drawings, designs or specifications prepared, acquired or used by the Engineer and/or solely by the negligence or fault of the Engineer; and provided further, that the Contractor shall not be required to indemnify the Owner, his officers, agents, servants or employees, against any such damages occasioned solely by acts or omissions of the Owner other than supervisory acts or omissions of the Owner in the Work.

F. The Contractor shall have complete responsibility for the Work and the protection thereof, and for preventing injuries to persons and damage to the Work and property and utilities on or about the Work, until final completion and final acceptance thereof. He shall in no way be relieved of his responsibility by and right of the Engineer to give permission or directions relating to any part of the Work, by any such permission or directions given, or by failure of the Engineer to give such permission or directions. The Contractor shall bear all costs, expenses, losses and damages on account of the quantity or character of the Work or the nature of the land (including but not limited to subsurface conditions) in or under or on which the Work is done being different from that indicated or shown in the Contract Documents or from what was estimated or expected, or on account of the weather, elements, or other causes.

G. The Contractor shall conduct his operations so as not to damage existing structures or work installed either by him or by other contractors. In case of any such damage resulting from his operations, he shall repair and make good as new the damaged portions at his own expense with the consent of the damaged party. In the event that consent is not given, the Contractor shall continue liable for the damage caused.

H. The Contractor shall be as fully responsible to the Owner for the acts and omissions of his subcontractors, their officers, agents, servants and employees as he is for his own acts and omissions and those of his own officers, agents, servants and employees.

I. Should the Contractor sustain any loss, damage or delay through any act or omission of any other contractor or any subcontractor of any such other contractor, the Contractor shall have no claim against the Owner therefor, other than for an extension of time, but shall have recourse solely to such other contractor or subcontractor.

J. If any other contractor or any subcontractor of any such other contractor shall suffer or claim to have suffered loss, damage or delay by reason of the acts or omissions of the contractor or of any of his subcontractors, the Contractor agrees to assume the defense against any such claim and to reimburse such other contractor or subcontractor for such loss or damage.
K. The Contractor agrees to and does hereby indemnify and save harmless the Owner from and against any and all claims by such other contractors or subcontractors alleging such loss, damage or delay from and against any and all claims, demands, suits, proceedings, liabilities, judgments, awards, losses, damages, costs and expenses, including attorneys’ fees, arising out of, relating to or resulting from such claims.

L. The Contractor shall promptly pay all federal, state and local taxes which may be assessed against him in connection with the Work or his operations under the AGREEMENT and/or the other Contract Documents, including, but not limited to, taxes attributable to the purchase of material and equipment, to the performance of services, and the employment of persons in the prosecution of the Work.

M. Asbestos, PCBs, Petroleum, Hazardous Waste or Radioactive Material

1. The Owner shall be responsible for any Asbestos, PCBs, Petroleum, Hazardous Waste or Radioactive Material uncovered or revealed at the site which was not shown or indicated in Drawings or Specification or identified in the Contract Documents to be within the scope of the Work and which may present a substantial danger to persons or property exposed thereto in connection with the Work at the site. The Owner shall not be responsible for any such materials brought to the site by the Contractor, Subcontractors, Suppliers or anyone else for whom the Contractor is responsible.

2. To the fullest extent permitted by Laws and Regulations, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Engineer, Engineer’s Consultants and the officers, directors, employees, agents other consultants and subcontractors of each and any of them from and against all claims, costs, losses and damages arising out of or resulting from such hazardous condition, provided that: (i) any such claim, cost, loss or damage 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 (ii) nothing in this subparagraph shall obligate the Owner to indemnify any person or entity from and against the consequences of that person’s or entity’s own negligence.

1.04 AUTHORITY OF THE ENGINEER

A. The Engineer shall be the sole judge of the intent and meaning of the Drawings and Specifications and his decisions thereon and his interpretation thereof shall be final, conclusive and binding on all parties.

B. The Engineer shall be the Owner’s representative during the life of the Contract and he shall observe the Work in progress on behalf of the Owner. He shall have authority (1) to act on behalf of the Owner to the extent expressly provided in the Contract or otherwise in writing: (2) to determine the amount, quality, acceptability and fitness of all work, materials and equipment required by the Contract; and (3) to decide all questions which arise in relation to the Work, the execution thereof, and the fulfillment of the Contract.

C. The Contractor shall proceed without delay to perform the work as directed, instructed, determined or decided by the Engineer and shall comply promptly with such directions, instructions, determinations or decisions. If the Contractor has any objection thereto he may, within ten (10) days of having received any such direction, instruction, determination or decision, require that any such direction, instruction, determination or decision be put in writing and within ten (10) days after receipt of any such writing he may file a written protest with the Owner stating clearly and in detail his objections, the reasons therefor, and the nature and amount of additional compensation, if any, to which he claims he will be entitled thereby. A copy of such protest shall be filed with the Engineer at the same time it is filed with the Owner. Unless the Contractor requires that any such direction, instruction, determination or decision be put in writing within ten (10) days of having received such direction, instruction, determination or decision and unless the Contractor files such written protest with the Owner and Engineer within such ten (10) day period, he shall be deemed to have waived all grounds for protest of such direction, instruction, determination, or decision and all claims for additional compensation or damages occasioned thereby, and shall further be deemed to have accepted such direction, instruction, determination, or decision as being fair, reasonable, and finally determinative of his obligations and rights under the Contract.

1.05 SUPERVISION OF WORK

A. The Contractor shall be solely responsible for supervision of the Work, shall give the work the constant attention necessary to ensure the expeditious and orderly progress thereof, and shall cooperate with the Engineer in every possible way.

B. At all times, the Contractor shall have his agent on the Work a competent superintendent capable of reading and thoroughly understanding the Drawings and Specifications, with full authority to execute the directions of the Engineer without delay and to supply promptly such labor, services, materials, equipment,
C. Whenever the Contractor or his agent or superintendent is not present on any part of the Work where it may be necessary to give directions or instructions with respect to such work, such directions or instructions may be given by the Engineer to and shall be received and obeyed by the designated foreman or any other person in charge of the particular work involved.

1.06 INSURANCE

A. Before starting and until final completion and acceptance of the Work and expiration of the guarantee period provided for in the AGREEMENT the Contractor shall procure and maintain insurance of the types specified in paragraphs (1) to (11), inclusive, below, and to the limits for this insurance specified in Table A at the end of this section. All insurance shall be obtained from companies satisfactory to the Owner and Engineer.

B. Insurance shall be in such forms as will protect the Contractor from all claims and liability for damages for bodily and personal injury, including accidental death, and for property damage, which may arise from operations under the Contract, whether such operations be by himself, his subcontractors, or by anyone directly or indirectly employed or engaged by him.

C. The City of Quincy, Massachusetts (Owner) and the Engineer shall be named as an "additionally insured".

D. All insurance policies provided by the Contractor shall include a "Waiver of Subrogation" endorsement for the Owner, Engineer and/or other third party entity.

E. The following types of insurance shall be provided on all policies:

1. Workmen's Compensation and Employer's Liability Insurance.

2. General Liability coverage, including Bodily Injury Insurance for operations and completed operations and Contractor's Protective Bodily Injury Insurance.

3. General Liability coverage, including Property Damage Insurance for operations and completed operations and Contractor's Protective Property Damage Insurance, each including coverage for injury to or destruction of wires or pipes and similar property and appurtenant apparatus and the collapse of or structural injury to any building or structure except those on which work under the Contract is being done. Blasting and explosion coverage shall be obtained if there is a need for blasting under the Contract, and no blasting shall be performed until such insurance has been secured.

4. Bodily Injury Insurance covering the operation of all motor vehicles owned by the Contractor.

5. Personal Injury Insurance to cover claims for personal injury and including claims brought by employees.

6. Property Damage Insurance covering the operation of all motor vehicles owned by the Contractor.

7. Insurance to cover bodily injuries and property damage resulting from the use of motor vehicles not owned by the Contractor, while such vehicles are being operated in connection with the prosecution of the Work.

8. Contractual Liability Insurance covering the liability assumed by the Contractor under the fifth paragraph of that subsection titled "Obligations and Liability of Contractor" of this AGREEMENT.

9. Owner’s/Contractor’s Protective Liability and Property Damage Insurance to protect the Owner and the Engineer against claims for Property damage and for bodily injuries, including accidental death, caused by the operations of the Contractor or his subcontractors on the Work. The policy shall indicate the Owner and the Engineer as the named insured. A copy of the policy shall be furnished to the Owner and a Certificate of Insurance shall be furnished to the Engineer.

10. Excess/Umbrella Liability Coverage shall be provided in accordance with the minimum limits stated in Table A.

11. Builders' Risk Insurance with an "All Risk" Installation Floater covering loss by fire and extended coverage in the completed value form in the amount of the total insurable value of all structures, materials, and equipment to be built and installed. The insurance shall be obtained from a company satisfactory to the Owner. The policy shall indicate Owner, the Contractor, all subcontractors, and the Engineer as the
named insured with loss payable to the Owner as Trustee. The policy shall provide for a 30-day notice to the Owner of cancellation or restrictive amendment. A copy of the policy shall be furnished to the Owner and a Certificate of Insurance shall be furnished to the Engineer. The insurance shall be obtained before the work is started and shall be maintained until the date of completion of the work as stated in the final estimate, or until the Owner occupies or otherwise take possession of the structure, whichever occurs first.

F. All policies shall be so written that the Owner will be notified in writing of cancellation or restrictive amendment at least 30 days prior to the effective date of such cancellation or amendment.

G. Certificates from the Contractor's insurance carriers stating the coverage provided, the limits of liability, and expiration dates shall be filed in triplicate with the Owner before operations are begun.

H. Certificates from the contractor naming the Owner, City of Quincy, Massachusetts and the Engineer as additionally insured must be received by the Owner prior to initiating the work.

I. Renewal certificates must be furnished by the Contractor prior to the expiration date of any of the initial insurances.

J. No insurance required or furnished hereunder shall in any way relieve the Contractor of or diminish any of his responsibilities, obligations and liabilities under the Contract.

1.07 PATENTS

A. The Contractor's attention is directed to the following "Patent Indemnity Clause" illustrating the format and/or required wording therefore which shall be used by all manufacturers and/or suppliers, as deemed necessary by the Owner and Engineer, as an Indemnification and Hold Harmless Agreement.

B. This Agreement shall be accepted and approved in form by the Owner and Engineer prior to the approval and/or installation of the product.

PATENT INDEMNIFICATION

"In consideration for their purchase and use of the (Name of product and/or equipment) manufactured by (name of Manufacturer) and for other good and valuable consideration, (Name of Manufacturer) agrees to defend and hold harmless (Name of Contractor), BETA Group, Inc., and the (Name of Owner), and their employees and agents, from and against any liability, loss, cost, expense or damage including reasonable attorneys' and accountants' fees incurred by these entities in defending or prosecuting any claim for such liability, loss, cost, expense or damage resulting or arising out of a claim that the use of the above mentioned product and/or equipment delivered hereunder directly infringes any United States Patent, provided that (Name of Manufacturer) is given authority, information, and assistance for the defense of such suit, and (Name of Manufacturer) shall pay all damages and costs assessed against the above named entities for the use of such produce and/or equipment provided, however, that this indemnification shall not apply to equipment of (Name of Contractor) design, and provided further that if the use of such product and/or equipment is enjoined in any suit, (Name of Manufacturer) shall at its own expense and its option either procure for (name of Contractor) the right to continue the normal use of such produce and/or equipment, replace said product and/or equipment, modify said equipment or refund the purchase price thereof; and provided further that (Name of Manufacturer) indemnity as to use shall not apply to infringement resulting from the use of the produce and/or equipment delivered hereunder in combination with other items where use of the product and/or equipment per se does not constitute infringement."

1.08 COMPLIANCE WITH LAWS

A. The Contractor shall keep himself fully informed of all existing and future federal, state, and local laws, ordinances, rules, and regulations affecting those engaged or employed on the Work, the materials and equipment used in the Work or the conduct of the Work, and of all orders, decrees and other requirements of bodies of tribunals having any jurisdiction or authority over the same. If any discrepancy or inconsistency is discovered in the Drawings, Specifications or other Contract Documents in relation to any such law, ordinance, rule, regulation, order, decree or other requirement, the Contractor shall forthwith report the same to the Engineer in writing. The Contractor shall at all times observe and comply with, and cause all his agents, with all such existing and future laws, ordinances, rules, regulations, orders, decrees and other requirements, and he shall protect, indemnify and save harmless the Owner, its officers, agents, servants and employees, from and against any and all claims, demands, suits, proceedings, liabilities, judgments, penalties, losses, damages, costs and expenses, including attorneys' fees, arising from or based upon any violation or claimed violation of any such law, ordinance, rule, regulation, order, decree or
other requirement, whether committed by the Contractor or any of his agents, servants, employees or subcontractors.

1.09 PROVISIONS REQUIRED BY LAW DEEMED INSERTED

A. Each and every provision of law and clause required by law to be inserted in the Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though they were included herein. If through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion.

1.10 PERMITS

A. The Contractor shall, at his own expense, take out and maintain all necessary permits from the county, municipal, or other public authorities; shall give the notices required by law; and shall post all bonds and pay all fees and charges incident to the due and lawful prosecution of the Work.

1.11 NOT TO SUBLET OR ASSIGN

A. The Contractor shall constantly give his personal attention to the faithful prosecution of the Work, shall keep the same under his personal control, shall not assign the Contract or sublet the Work or any part thereof without the previous written consent of the Owner, and shall not assign any of the moneys payable under the Contract, or his claim thereto, unless by and with the like written consent of the Owner and the Surety on the Contract Bonds. Any assignment or subletting in violation hereof shall be void and unenforceable.

B. The Contractor shall not sublet or assign work to a subcontractor(s), for a total in excess of fifty (50) percent of the Contract Price, without prior written approval of the Owner and Engineer.

C. The Contractor shall be fully responsible to the Owner for the acts and omissions of his subcontractors, suppliers, and of persons either directly or indirectly employed by them as he is for the acts and omissions of persons directly employed by him.

D. The Contractor shall cause appropriate provisions, and applicable State or Federal regulations, to be inserted in all subcontractors relative to the work to bind subcontractors to the Contractor by the terms of the Contract Documents insofar as applicable to the work of subcontractors, and to give the Contractor the same power as regards terminating any subcontract that the Owner may exercise over the Contractor under any provision of the Contract Documents.

E. The Contractor's attention is directed to the fact that nothing contained in this Contract shall create any contractual relation between any subcontractor and the Owner.

1.12 DELAY BY OWNER

A. The Owner may delay the beginning of the Work or any part thereof if the necessary lands or rights-of-way for such work shall not have been obtained. The Contractor shall have no claim for additional compensation or damages on account of such delay, but shall be entitled only to any extension of time as hereinafter provided.

1.13 TIME FOR COMPLETION

A. The rate of progress shall be such that the Work shall be performed and completed in accordance with the Contract before the expiration of the time limit stipulated in Table A at the end of this section, except as otherwise expressly provided herein.

B. It is agreed that the rate of progress herein required has been purposely made low enough to allow for the ordinary and foreseeable delays incident to construction work of this character. No extension of time will be given for ordinary or foreseeable delays, inclement weather, or accidents and the occurrence of such will not relieve the Contractor from the necessity of maintaining this rate of progress and completing the Work within the stipulated time limit.

C. If delays are caused by acts of God, acts of Government, unavoidable strikes, extra work, or other cause or contingencies clearly beyond the control or responsibility of the Contractor, the Contractor may be entitled to additional time to perform and complete the Work, provided that the Contractor shall, within ten (10) days from the beginning of such delay notify the Owner in writing, with a copy to the Engineer, of the cause and particulars of the delay. Upon receipt of such notification, the Owner shall review and evaluate the cause and extent of the delay. If, under the terms of the AGREEMENT, the delay is properly excusable, the Owner will, in writing, appropriately extend the time for completion of the Work. (This paragraph will be interpreted to include delays in receipt of equipment provided that the Contractor placed his order and submitted shop drawings for such equipment promptly.
after execution of the Contract, that he has shown due diligence in following the progress of the order, and that the time required for delivery is in accordance with conditions generally prevailing in the industry.) The Contractor agrees that he shall not have or assert any claim for nor shall he be entitled to any additional compensation or damages on account of such delays.

D. The time in which the Work is to be performed and completed is of the essence of this AGREEMENT.

1.14 LIQUIDATED DAMAGES

A. In case the Contractor fails to complete the Work satisfactorily on or before the date of completion fixed herein or as duly extended as hereinbefore provided, the Contractor agrees that the Owner shall deduct from the payments due the Contractor each month the sum set forth in Table A at the end of this section for each calendar day of delay, which sum is agreed upon not as a penalty, but as fixed and liquidated damages for each day of such delay. If the payments due the Contractor are less than the amount of such liquidated damages, said damages shall be deducted from any other moneys due or to become due the Contractor, and, in case such damages shall exceed the amount of all moneys due or to become due the Contractor, the Contractor or his Surety shall pay the balance to the Owner.

1.15 NIGHT, SATURDAY, SUNDAY AND HOLIDAY WORK

A. No work shall be done at night (defined as 5:00 PM to 7:00 AM), on Saturday on Sunday or on a holiday except (1) usual protective work, such as pumping and the tending of lights, (2) work done in case of emergency threatening injury to persons or property, or (3) if all of the conditions set forth in the next paragraph below are met.

B. No work other than that included in (1) and (2) above shall be done at night except when (a) in the sole judgment of the Owner, the work will be of advantage to the Owner and can be performed satisfactorily at night, (b) the work will be done by a crew organized for regular and continuous night work, and (c) in the sole judgment of the Owner and Engineer, adequate noise prevention measures are incorporated into the Work by the Contractor to minimize any noise impact within the work area and (d) the Owner has given written permission for such night work. The Contractor is responsible for obtaining all permits and approvals required.

1.16 EMPLOY COMPETENT PERSONS

A. The Contractor shall employ only competent persons on the Work and shall not employ persons or means which may cause strikes, work stoppages or any disturbances by persons employed by the Contractor, any subcontractor, the Owner, the Engineer or any other contractor. Whenever the Engineer notifies the Contractor in writing that in his opinion any person on the Work is incompetent, unfaithful, disorderly, or otherwise unsatisfactory, or not employed in accordance with the provisions of the Contract, such person shall be discharged from the Work and shall not again be employed on it, except with the written consent of the Engineer.

1.17 EMPLOY SUFFICIENT LABOR AND EQUIPMENT

A. If in the sole judgment of the Engineer the Contractor is not employing sufficient labor, plant, equipment or other means to complete the Work within the time specified, the Engineer may, after giving written notice, require the Contractor to employ such additional labor, plant, equipment and other means as the Engineer deems necessary to enable the Work to progress properly.

1.18 INTOXICATING LIQUORS AND/OR DRUGS

A. The Contractor shall not sell and shall neither permit nor suffer the introduction and/or use of illegal or unlawful intoxicating liquors and/or drugs upon or about the Work.

1.19 ACCESS TO WORK

A. The Owner, the Engineer, and their officers, agents, servants and employees may at any and all times and for any and all purposes, enter upon the Work and the site thereof and the premises used by the Contractor, and the Contractor shall at all times provide safe and proper facilities therefor.

1.20 EXAMINATION OF WORK

A. The Engineer shall be furnished by the Contractor with every reasonable facility for examining and inspecting the Work and for ascertaining that the Work is being performed in accordance with the requirements and intent of the Contract, even to the extent of requiring the uncovering or taking down portions of furnished work by the Contractor.
B. Should the work thus uncovered or taken down prove satisfactory, the cost of uncovering or taking down and the replacement thereof shall be considered as extra work unless the original work was done in violation of the Contract in point of time or in the absence of the Engineer or his inspector and without his written authorization, which case said cost shall be borne by the Contractor. Should the work uncovered or taken down prove unsatisfactory, said cost shall likewise be borne by the Contractor.

C. Examination of inspection of the Work shall not relieve the Contractor of any of his obligations to perform and complete the Work as required by the Contract.

1.21 DEFECTIVE WORK, ETC.

A. Until acceptance and during the applicable guarantee period thereafter, the Contractor shall promptly, without charge, repair, correct or replace work, equipment, materials, apparatus or parts thereof which are defective, damaged or unsuitable or which in any way fail to comply with or be in strict accordance with the provisions and requirements of the Contract or applicable guarantee and shall pay to the Owner all resulting costs, expenses, losses or damages suffered by the Owner.

B. If any material, equipment, apparatus or other items brought upon the site for use or incorporation in the Work, or selected for the same, is rejected by the Engineer as unsuitable or not in conformity with the Specifications or any of the other Contract Documents, the Contractor shall forthwith remove such materials, equipment, apparatus and other items from the site of the Work and shall at his own cost and expense make good and replace the same and any material furnished by the Owner which shall be damaged or rendered defective by the handling or improper installation by the Contractor, his agents, servants, employees or subcontractors.

1.22 PROTECTION AGAINST WATER AND STORM

A. The Contractor shall take all precautions necessary to prevent damage to the Work by storms or by water entering the site of the Work directly or through the ground. In case of damage by storm or water, the Contractor shall at his own cost and expense make such repairs or replacements or rebuild such parts of the Work as the Engineer may require in order that the finished Work may be completed as required by the Contract.

1.23 RIGHT TO MATERIALS

A. Nothing in the Contract shall be construed as vesting in the Contractor any right of property in the materials, equipment, apparatus and other items furnished after they have been installed or incorporated in or attached or affixed to the Work or the site, but all such materials, equipment, apparatus and other items shall, upon being so installed, incorporated, attached or affixed, become the property of the Owner. Nothing in this subsection shall relieve the Contractor of his duty to protect and maintain all such materials, equipment, apparatus and other items.

1.24 CHANGES

A. The Owner, through the Engineer, may make changes in the Work and in the Drawings and Specifications therefor by making alterations therein, additions thereto or omissions therefrom. All work resulting from such changes shall be performed and furnished under the pursuant to the terms and conditions of the Contract. If such changes result in an increase or decrease in the Work to be done hereunder, or increase or decrease the quantities thereof, adjustment in compensation shall be made therefor at the unit prices stipulated in the Contract for such work, except that if unit prices are not stipulated for such work, compensation for additional or increased work shall be made as provided hereinafter under the subsection titled "Extra Work"; and for eliminated or decreased work the Contractor shall allow the Owner a reasonable credit as determined by the Engineer.

B. Except in an emergency endangering life or property, no change shall be made unless in pursuance of a written order from the Engineer authorizing the change, and no claim for additional compensation shall be valid unless the change is so ordered.

C. The Contractor agrees that he shall neither have nor assert any claim for or be entitled to any additional compensation for damages or for loss of anticipated profits on work that is eliminated.

1.25 EXTRA WORK

A. The Contractor shall perform any extra work (work in connection with the Contract but not provided for herein) when and as ordered in writing by the Engineer, at the unit prices stipulated in the Contract for such work or, if none are so stipulated, whether (a) at the price agreed upon before such work is commenced and named in the written order for such work, or (b) if the Engineer so elects, for the reasonable cost of such work, as determined by the
contractor and approved by the Engineer, plus a percentage of such cost, as set forth below. No extra work shall be paid for unless specifically ordered as such in writing by the Engineer.

B. The Contractor shall submit claim for any extra work within fourteen (14) calendar days of performing said extra work.

C. The cost of extra work done under (b) above shall include the reasonable cost to the Contractor of materials used and equipment installed, common and skilled labor, and foremen, and the fair rental of all machinery and equipment used on the extra work for the period of such use.

D. At the request of the Engineer, the Contractor shall furnish itemized statements for the cost of the extra work ordered as above and give the Engineer access to all records, accounts, bills and vouchers and correspondence relating thereto.

E. The Contractor may include in the cost of extra work the amounts of additional premiums, if any, (other than premiums on bonds) paid on the required insurance on account of such extra work, of Social Security or other direct assessments upon the Contractor's payroll by Federal or other properly authorized public agencies, and of other approved assessments when such assessments are not normally included in payments made by the Contractor directly to his employees, but in fact are, and are customarily recognized as, part of the cost of doing work.

F. The fair rental hourly rate for all machinery and equipment shall be based upon the most recent edition of "Rental Rate Blue Book" published by Equipment Watch or a similar publication approved by the Engineer. Hourly rental rates for machinery and equipment shall be developed by dividing the monthly Blue Book rates by 176 hours per month plus Estimated Hourly Operating Costs (FHWA rate). Rate Adjustment tables shall be utilized for equipment model year and region of operation. If said extra work requires the use of machinery or equipment not already on the site of the Work the cost of transportation, not exceeding a distance of 100 miles, of such machinery or equipment to and from the Work shall be added to the fair monthly rental; provided, however, that this shall not apply to machinery or equipment already required to be furnished under the terms of the Contract.

G. The Contractor shall not include in the cost of extra work any cost or rental of small tools, building, or any portion of the time of the Contractor, his superintendent, or his office and engineering staff.

H. To the cost of extra work done by the Contractor's own forces under (b) above (determined as stated above), the Contractor may add 15 percent to cover his overhead, use of capital, the premium on the Bonds as assessed upon the amount of this extra work, and profit.

I. In the case of extra work done under (b) by a subcontractor the subcontractor shall compute, as above, his cost for the extra work, to which he may add 15 percent as in the case of the Contractor. The Contractor shall be allowed an additional 5 percent of the subcontractor's initial cost for the extra work prior to the 15 percent adjustment, to cover the costs of the Contractor's overhead use of capital, the premium on the Bonds as assessed upon the amount of this work, and profit. Said subcontractor's cost must be reasonable and approved by the Engineer.

J. If extra work is done under (b) above, the Contractor and/or subcontractor shall keep daily records of such extra work. The daily record shall include the names of men employed, the nature of the work performed, and hours worked, materials and equipment incorporated, and machinery or equipment used, if any, in the prosecution of such extra work. This daily record, to constitute verification that the work was done, must be signed both by the Contractor's authorized representative and by the Engineer. A separate daily record shall be submitted for each Extra Work Order.

1.26 EXTENSION OF TIME ON ACCOUNT OF EXTRA WORK

A. When extra work is ordered near the completion of the Contract or at any time during the progress of the Work which unavoidably increases the time for the completion of the Work, and extension of time shall be granted as hereinbefore provided.

1.27 CHANGES NOT TO AFFECT BONDS

A. It is distinctly agreed and understood that any changes made in the Work or the Drawings or Specifications therefor (whether such changes increase or decrease the amount thereof or the time required for its performance) or any changes in the manner of time of payments made by the Owner to the Contractor, or any other modifications of the Contract, shall in no way annul, release, diminish or affect the liability of the Surety on the CONTRACT BONDS given by the
Contractor, it being the intent hereof that notwithstanding such changes the liability of the Surety on said bonds continue and remain in full force and effect.

1.28 CLAIMS FOR DAMAGES

A. If the Contractor makes claim for any damages alleged to have been sustained by breach of contract or otherwise, he shall, within ten (10) days after occurrence of the alleged breach or within ten (10) days after such damages are alleged to have been sustained, whichever date is the earlier, file with the Engineer a written, itemized statement of the details of the alleged breach and the details and amount of the alleged damages. The Contractor agrees that unless such statement is made and filed as so required, his claim for damages shall be deemed waived, invalid and unenforceable, and that he shall not be entitled to any compensation for any such alleged damages. Within ten (10) days after the timely filing of such statement, the Engineer shall file with the Owner a copy of the statement, together with his recommendations for action by the Owner.

B. The Contractor shall not be entitled to claim any additional compensation for damages by reason of any direction instruction, determination or decision of the Engineer, nor shall any such claims be considered, unless the Contractor shall have complied in all respects with the Article titled "Authority of the Engineer", including, but not limited to the filing of a written protest in the manner and within the time therein provided.

1.29 ABANDONMENT OF WORK OR OTHER DEFAULT

A. If the Work shall be abandoned, or any part thereof shall be sublet without previous written consent of the Owner, or the Contract or any moneys payable hereunder shall be assigned otherwise than as herein specified, or if at any time the Engineer shall be of the opinion, and shall so certify in writing, that the conditions herein specified as to rate of progress are not being complied with, or that the Work or any part thereof is being unnecessarily or unreasonably delayed, or that the Contractor has violated or is in default under any of the provisions of the Contract, or if the Contractor becomes bankrupt or insolvent or goes or is put into liquidation or dissolution, either voluntarily or involuntarily, or petitions for an arrangement or reorganization under the Bankruptcy Act, or makes a general assignment for the benefit of creditors or otherwise acknowledges insolvency, the happening of any of which shall be and constitute a default under the Contract, the Owner may notify the Contractor in writing, with a copy of such notice mailed to the Surety, to discontinue all Work or any part thereof; thereupon the Contractor shall discontinue such Work or such part thereof as the Owner may designate; and the Owner may, upon giving such notice, by contract or otherwise as it may determine, complete the Work or such part thereof and charge the entire cost and expense of so completing the Work or such part thereof to the Contractor. In addition to the said entire cost and expense of completing the Work, the Owner shall be entitled to reimbursement from the Contractor and the Contractor agrees to pay to the Owner any losses, damages, costs and expenses, including attorney's fees, sustained or incurred by the Owner by reason of any of the foregoing causes. For the purposes of such completion the Owner may for itself or for any Contractors employed by the Owner take possession of and use or cause to be used any and all materials, equipment, plant, machinery, appliances, tools, supplies and such other items of every description that may be found or located at the site of the Work.

B. All costs, expenses, losses, damages, attorney's fees and any and all other charges incurred by the Owner under this subsection shall be charged against the Contractor and deducted and/or paid by the Owner out of any moneys due of payable or to become due or payable under the Contract to the Contractor; in computing the amounts chargeable to the Contractor the Owner shall not be held to a basis of the lowest prices for which the completion of the Work or any part thereof might have been accomplished, but all sums actually paid or obligated therefor to effect its prompt completion shall be charged to and against the account of the Contractor. In case the costs, expenses, losses, damages, attorney's fees and other charges together with all payments theretofore made to or for the account of the Contractor are less than the sum which would have been payable under the Contract if the Work had been properly performed and completed by the Contractor, the Contractor shall be entitled to receive the difference, and, in case such costs, expenses, losses, damages, attorneys' fees and other charges, together with all payments theretofore made to or for the account of the Contractor, shall exceed the said sum, the Contractor shall pay the amount of the excess to the Owner.

1.30 PRICES FOR WORK

A. The Owner shall pay and the Contractor shall receive the prices stipulated in the BID made a part hereof as full compensation for everything performed and furnished and for all risks and obligations undertaken by the Contractor under and as required by the Contract.
1.31 MONEYS MAY BE RETAINED

A. The Owner may at any time retain from any moneys which would otherwise be payable hereunder so much thereof as the Owner may deem necessary to complete the Work hereunder and to reimburse it for all costs, expenses, losses, damage and damages chargeable to the Contractor hereunder, in accordance with the States General Laws.

1.32 FORMAL ACCEPTANCE

A. This Agreement constitutes an entire contract for one whole and complete Work or result. Fixing of the date of completion and acceptance of the Work or a specified part thereof shall only be effective when accomplished by a writing specifically so stating and signed by the Owner.

1.33 PROGRESS ESTIMATES

A. Once a month, except as hereinafter provided, the Engineer shall make an estimate in writing of the total amount and value of the work done to the first of the month by the Contractor. The Owner shall retain a percentage of such estimated value, as set forth in Table A at the end of this section, as part security for fulfillment of the Contract by the Contractor and shall deduct from the balance all previous payments made to the Contractor, all sums chargeable against the Contractor and all sums to be retained under the provisions of the Contract.

B. Estimates of lump-sum items shall be based on a schedule dividing each such item into its appropriate component parts together with a quantity and a unit price for each part so that the sum of the products of prices and quantities will equal the Contract price for the item. This schedule must be submitted by the Contractor for and must have the approval of the Engineer before the first estimate becomes due.

C. If the Engineer determines that the progress of the Work will be benefited by the delivery to the site of certain materials and equipment, when available, in advance of actual requirement therefor and if such materials and equipment are delivered and properly stored, protected and insured as determined by the Engineer, the cost to the Contractor or subcontractor as established by invoices or other suitable vouchers satisfactory to the Engineer, less the retained percentages as above provided, may be included in the progress estimates; provided always that there be duly executed and delivered by the Contractor to the Engineer at the same time a Bill of Sale in form satisfactory to the Owner, transferring and assigning to the Owner full ownership and title to such materials or equipment.

D. The Owner shall pay monthly to the Contractor in accordance with General Laws Chapter 30, Section 39, as amended:

1. Within fifteen (15) days (twenty-four (24) days in the case of the Commonwealth) after receipt from the Contractor, at the place designated by the Owner if such a place is so designated, of a periodic estimate requesting payment of the amount due for the preceding month, the Owner will make 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 Owner, 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 39F 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 65 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 original contract price, or (b) the Contractor substantially completes the work and the Owner takes possession for occupancy, whichever occurs first, the Owner 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 and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section 39F, 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 39F. If the Owner 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 than charged by the Federal Reserve Bank of Boston commencing on the first day after said payment is due and continuing until payment delivered or mailed to the Contractor; provided, that no interest shall be due, in any event, on the amount due on periodic estimate for final payment until 15 days (24 days in the case of the Commonwealth) after receipt of
such a periodic estimate from the Contractor, at the place designated by the Owner if such a place is so designated. The Contractor agrees to pay to each subcontractor a portion of any such interest in accordance with the amount due each subcontractor.

2. Forthwith after the Contractor receives payment on account of a periodic estimate, the 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 Contractor.

3. Not later than the 65th 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 Owner as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the subcontractor; and the Owner shall pay that amount to the Contractor. The Contractor shall forthwith pay to the subcontractor the full amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the Contractor.

4. Each payment made by the Owner to the Contractor pursuant to subparagraphs (2) and (3) of this paragraph for the labor performed and the materials furnished by a subcontractor shall be made to the Contractor for the account of that subcontractor; and the Owner shall take reasonable steps to compel the Contractor to make each such payment to each such subcontractor. If the Owner has received a demand for direct payment from a subcontractor for any amount which has already been included in a payment to the Contractor or which is to be included in a payment to the Contractor for payment to the subcontractor as provided in subparagraphs (2) and (3), the Owner shall act upon the demand as provided in this section.

5. If, within 70 days after the subcontractor has substantially completed the subcontract work, the subcontractor has not received from the Contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the Contractor, less any amount retained by the Owner as the estimated cost of completing the incomplete or unsatisfactory items of work, the subcontractor may demand direct payment of that balance from the Owner. The demand shall be by a sworn statement delivered to or sent by certified mail to the Owner, and a copy shall be delivered to or sent by certified mail to the 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 70th 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 Owner and delivered or so mailed a copy to the Contractor, the Contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the Owner 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 Contractor and of the amount due for each claim made by the Contractor against the subcontractor.

6. Within 15 days after receipt of the demand by the Owner, but in no event prior to the 17th day after substantial completion of the subcontract work, the Owner 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 Contractor, less any amount (i) retained by the Owner 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 Contractor in the sworn reply; provided, that the Owner 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 (5). The Owner 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.

7. The Owner shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (6) in an interest-bearing joint account in the names of the Contractor and the subcontractor in a bank in Massachusetts selected by the Owner or agreed upon by the Contractor and the subcontractor and shall notify the 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 Contractor and the subcontractor or as determined by decree of a court of competent jurisdiction.

8. 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 (7) shall be made out of amounts payable to the 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 Contractor and in the order of receipt of such demands from
subcontractors. All direct payments shall discharge the obligation of the Owner to the Contractor to the extent of such payment.

9. The Owner shall deduct from payments to a Contractor amounts which, together with the deposits in interest-bearing accounts pursuant to subparagraph (7), 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 Contractor.

10. If the subcontractor does not receive payment as provided in subparagraph (2) or if the 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 (2), the subcontractor may demand direct payment by following the procedure in subparagraph (5) and the Contractor may file a sworn reply as provided in that same subparagraph. A demand made after the first day of the month following that 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 Contractor. Thereafter the Owner shall proceed as provided in subparagraph (6), (7), (8), and (9).

11. "Subcontractor" as used in subparagraph 10, shall mean a person who files a sub-bid and receives a subcontract as a result of that filed subbid or who is approved by the Owner in writing as a person performing labor or both performing labor and furnishing materials pursuant to a contract with the Contractor.

1.34 PARTIAL ACCEPTANCE

A. The Owner may, at any time in a written order to the Contractor (1) declare that he intends to use a specified part of the Work which in his opinion is sufficiently complete, in accordance with the Contract Documents, to permit its use; (2) enclose a tentative list of items remaining to be completed or corrected, and (3) fix the date of acceptance of that specified part of the Work.

B. Within 45 days after acceptance under this subsection, the Engineer shall make an estimate in writing of the amount and value of the part of the Work so accepted. The Owner shall pay said amount to the Contractor after deducting therefrom all previous payments, all charges against the Contractor as provided for hereunder, and all amounts to be retained under the provisions of the Contract, said payment to be made at the time of the next monthly progress estimate.

C. Acceptance by the Owner under this subsection shall not relieve the Contractor of any obligations under the Contract Documents except to the extent agreed upon in writing between the Owner and the Contractor.

D. The Owner shall have the right to exclude the Contractor from any part of the Work which has been accepted, but the Owner will allow the Contractor reasonable access thereto to complete or correct items on the tentative list.

1.35 FINAL ESTIMATE AND PAYMENT

A. As soon as practicable (but not more than sixty-five (65) days after final completion of the Work), the Engineer shall make a final estimate in writing of the quantity of Work done under the Contract and the amount earned by the Contractor.

B. The Owner shall pay to the Contractor the entire amount found by the Engineer to be earned and due hereunder after deducting therefrom all previous payments, all charges against the Contractor as provided for hereunder, and all amounts to be retained under the provisions of the Contract. Except as in this subsection otherwise provided, such payment shall be made not later than fifteen (15) days after but in no event before, the expiration of the time within which claims for labor performed or materials or equipment furnished must be filed under the applicable Lien Law, or, if such time is not specified by law, the expiration of thirty (30) days after the completion of the Engineer's final estimate.

C. All quantities shown on progress estimates and all prior payments shall be subject to correction in the final estimate and payment as determined by the Engineer.

D. The acceptance by the Contractor of final payment shall be and shall operate as a release to the Owner of all claims and all liability to the Contractor under or by virtue of this Agreement; and upon satisfactory completion of the work performed under this Agreement, as a condition before final payment under this Agreement or as a termination settlement under this Agreement the Contractor shall execute and deliver to the Owner a release of all claims against the Owner arising under or by virtue of, this Agreement, except claims which are specifically exempted by the Contractor to be set forth herein. Unless otherwise
provided in this Agreement, by State law or otherwise expressly agreed to be the parties to this Agreement, any payment, including final payment under, this Agreement or settlement upon termination of this Agreement shall not constitute a waiver of the Owner's claims against the Contractor or his sureties under this Agreement or applicable Performance and Labor and Materials Bonds.

1.36 LIENS
A. If at any time any notices of lien are filed and labor performed or materials or equipment manufactured, furnished, or delivered to or for the Work, the Contractor shall, at its own cost and expense, promptly discharge, remove or otherwise dispose of the same, and until such discharge, removal or disposition, the Owner shall have the right to retain from any moneys payable hereunder an amount which, in its sole judgement, it deems necessary to satisfy such liens and pay the costs and expenses, including attorneys’ fees, of defending any actions brought to enforce the same, or incurred in connection therewith or by reason thereof.

1.37 CLAIMS
A. If at any time there be any evidence of any claims for which the Contractor is or may be liable or responsible hereunder, the Contractor shall promptly settle or otherwise dispose of the same, and until such claims are settled or disposed of, the Owner may retain from any moneys which would otherwise be payable hereunder so much thereof as, in its sole judgement, it may deem necessary to settle or otherwise dispose of such claims and to pay the costs and expenses, including attorney's fees, of defending any actions brought to enforce such claims, or incurred in connection therewith or by reason thereof.

1.38 APPLICATION OF MONEYS RETAINED
A. The Owner may apply any moneys retained hereunder to reimburse itself for any and all costs, expenses, losses, damage and damages, liabilities, suits, judgements and awards incurred, suffered or sustained by the Owner and chargeable to the Contractor hereunder or as determined hereunder.

1.39 NO WAIVER
A. Neither the inspection by the Owner or the Engineer, nor any order, measurement, approval, determination, decision or certificate by the Engineer, nor any order by the Owner for the payment of money, nor any payment for or use, occupancy, possession or acceptance of the whole or any part of the Work by the Owner, nor any extension of time, nor any other act or omission of the Owner or of the Engineer shall constitute or be deemed to be an acceptance of any defective or improper work, materials, or equipment nor operate as a waiver of any requirement or provision of the Contract, nor of any remedy, power or right of or herein reserved to the Owner, nor of any right to damages for breach of contract. Any and all rights and/or remedies provided for in the Contract are intended and shall be construed to be cumulative; and, in addition to each and every other right and remedy provided for herein or by law, the Owner shall be entitled as of right to a writ of injunction against any breach or threatened breach of the Contract by the Contractor, by his subcontractors or by any other person or persons.

1.40 LIABILITY OF OWNER
A. No person, firm or corporation, other than the Contractor who signed this Contract as such, shall have any interest herein or right hereunder. No claim shall be made or be valid either against the Owner or any agent of the Owner and neither the Owner nor any agent of the Owner shall be liable for or be held to pay any money, except as herein provided. The acceptance by the Contractor of the payment as fixed in the final estimate shall operate as and shall be a full and complete release of the Owner and of every agent of the Owner of and from any and all claims, demands, damages and liabilities of, by or to the Contractor for anything done or furnished for or arising out of or relating to or by reason of the Work or for or on account of any act or neglect of the Owner or of an agent of the Owner or of any other person, arising out of, relating to or by reason of the Work, except the claim against the Owner for the unpaid balance, if any there be, of the amounts retained as herein provided.

1.41 GUARANTEE
A. The Contractor guarantees that the Work and services to be performed under the Contract, and all workmanship, materials 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 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 in
accordance with that subsection of this AGREEMENT titled "Partial Acceptance", the guarantee for that part of the Work shall be for a period of one year from the date fixed for such acceptance.

B. If at any time within the 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. If the Contractor neglects to commence making such 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, correction or replacements, including compensation for additional professional services, shall be paid by the Contractor.

1.42 RETURN OF DRAWINGS

A. All Drawings furnished by the Owner or the Engineer to the Contractor may be used only in connection with the prosecution of the Work and shall be returned by the Contractor upon completion of the Work.

1.43 CLEANING UP

A. The Contractor at all times shall keep the site of the Work free from rubbish and debris caused by his operations under the Contract. When the Work has been completed, the Contractor shall remove from the site of the Work all of his plant, machinery, tools, construction equipment, temporary work, and surplus materials so as to leave the Work and the site clean and ready for use.

1.44 LEGAL ADDRESS OF CONTRACTOR

A. The Contractor's business address and his office at or near the site of the Work are both hereby designated as places to which communications shall be delivered. The depositing of any letter, notice, or other communication in a postpaid wrapper directed to the Contractor's business address in a post office box regularly maintained by the Post Office Department or the delivery at either designated address of any letter, notice, or other communication by mail or otherwise shall be deemed sufficient service thereof upon the Contractor, and the date of such service shall be the date of receipt. The first-named address may be charged at any time by an instrument in writing, executed and acknowledged by the Contractor delivered to the Engineer. Service of any notice, letter, or other communication upon the Contractor personally shall likewise be deemed sufficient service.

1.45 HEADINGS

A. The headings or titles of any section, subsection, paragraph, provision, or part of the Contract Documents shall not be deemed to limit or restrict the content, meaning or effect of such section, subsection, paragraph, provision or part.

1.46 MODIFICATION OR TERMINATION

A. Except as otherwise expressly provided herein, the Contract may not be modified or terminated except in writing signed by the parties hereto.

1.47 DIRECT LABOR COST

A. Direct labor cost percentage for change orders shall be ____ percent. (Direct labor cost percent shall be established following award and prior to execution of the Contract).

1.48 MASSACHUSETTS TAX LAWS

A. The Contractor shall provide a statement that indicates compliance with all the requirements of Massachusetts General Law Chapter 62C.

1.49 MINORITY BUSINESS

A. Contractors and Subcontractors shall make positive efforts to achieve: (1) a minority employee work force goal of 15.30 percent, (2) a woman employee work force goal of 6.90 percent, (3) a goal of 7.24 percent participation of Minority-owned Business Enterprise(s), and (4) a goal of 3.60 percent participation of Woman-owned Business Enterprise(s) within the Project contracts to satisfy MWRA funding requirements.

1.50 TERMINATION FOR CONVENIENCE

A. This Agreement may be terminated by the Owner upon not less than seven days’ written notice for the Owner’s convenience. In the case of termination for convenience, the Owner shall be responsible for amounts due the Contractor for work performed through the date of termination, provided that the Contractor shall submit a request for payment in accordance with the provisions hereof. The Contractor shall have no other claim for payments due with respect to such termination including any claim for lost profits with respect to the balance of the project.
1.51 EQUAL EMPLOYMENT OPPORTUNITY, ANTIDISCRIMINATION AND AFFIRMATIVE ACTION

A. The Contractor shall not discriminate against or exclude any person from participation herein on grounds of race, religion, color, sex, age, or national origin; and that it shall take affirmative actions to insure that applicants are employed, and that employees are treated during their employment, without regard to race, religion, color, sex, age, handicapped status, or national origin.

1.52 UNLAWFUL CONDUCT AND PARTICIPATION IN BOYCOTT

A. The Contractor shall not participate in or cooperate with an international boycott, as defined in Section 999 (b) (3) and (4) of the Internal Revenue Code of 1954, as amended, or engage in conduct declared to be unlawful by Section 2 of Chapter 151E of the Massachusetts General Laws.

1.53 PROJECT AUDIT

A. The Contractor shall maintain books, records, documents, and other evidence directly related to the performance of all work receiving funding under the Financial Assistance Agreement in accordance with generally accepted professional practice and appropriate accounting procedures and practices. The Contractor shall also maintain the financial information and data used by the Contractor in the preparation or support of the cost submission and a copy of the cost summary submitted to the community. MWRA shall have access to such books, records, documents, and other evidence for inspection, audit, and copying during normal business hours, upon ten (10) days notice and at MWRA’s expense. The Contractor shall provide proper facilities for such access and inspection. All of the documents shall be kept for at least seven (7) years after the final payment to the engineer or contractor, or at least seven (7) years after closeout of the project, whichever is later.
CERTIFICATE OF ACKNOWLEDGMENT OF CONTRACTOR IF A CORPORATION
For AGREEMENT

State of _____________________________)
County _____________________________)

on this _____________ day of ______________, 20 __________, before me personally
came ________________________________ to me known, who being me duly
sworn, did depose and say as follows:

That he resides at ________________________________________________
and is the ______________________________ of ______________________________
of ______________________________
the corporation described in and which executed the foregoing instrument; that he knows the
corporate seal of said corporation; that the seal affixed to the foregoing instrument is such
 corporate seal and it was so affixed by order of the Board of Directors of said corporation; and
that by the like order he signed thereto his name and official designation.

__________________________________________________
Notary Public (Seal)

My commission expires ______________________________
<table>
<thead>
<tr>
<th>Agreement Subsection Reference</th>
<th>Item</th>
<th>Minimum limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.06</td>
<td>Workman's Compensation and Employer's Liability Insurance</td>
<td>As required by the law of the State of Massachusetts</td>
</tr>
<tr>
<td>1.06</td>
<td>General Liability including Contractor's Protective, Completed Operations and Contractual Liability</td>
<td>Bodily Injury/Property Damage including C.U. Coverage $1,000,000 (Each Occurrence) $2,000,000 (Aggregate) Blasting and explosion coverage shall be obtained if there is a need for blasting under the contract.</td>
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<tr>
<td>1.06</td>
<td>Personal Injury Insurance</td>
<td>$2,000,000 (Aggregate)</td>
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<tr>
<td>1.06</td>
<td>Automobile Liability including coverage for owned, hired or borrowed vehicles</td>
<td>Bodily Injury/Property Damage $1,000,000 Combined Single Limit (Each Occurrence)</td>
</tr>
<tr>
<td>1.06</td>
<td>Owner's/Contractor’s Protective (OCP) Bodily Injury/Property Damage &amp; Property Damage</td>
<td>Bodily Injury/Property Damage $3,000,000 (Each Occurrence) $3,000,000 (Aggregate)</td>
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<tr>
<td>1.06</td>
<td>Excess/Umbrella Liability Coverage</td>
<td>$5,000,000 (Each Occurrence) $5,000,000 (Aggregate)</td>
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<tr>
<td>1.06</td>
<td>Builder's Risk Insurance (If Applicable)</td>
<td>Total insurable value of all structures, materials, and equipment to be built and installed.</td>
</tr>
<tr>
<td>1.13</td>
<td>a) Time of Completion - Total Contract</td>
<td>Within 210 consecutive calendar days after the date specified in the Notice to Proceed</td>
</tr>
<tr>
<td>1.14</td>
<td>Liquidated Damages for each consecutive calendar day of delay in completion time</td>
<td>$1,200 .00</td>
</tr>
<tr>
<td>1.33</td>
<td>Percentage of Progress Estimates to be Retained</td>
<td>5%</td>
</tr>
</tbody>
</table>
SECTION 00600

CONTRACT BONDS

PERFORMANCE BOND

(NOTE: This Bond is issued simultaneously with the attached Labor and Materials Bond in favor of the Owner.)

KNOW ALL MEN BY THESE PRESENTS:

That we, ____________________________________________
(an individual, a partnership, a corporation)
duly organized under the Laws of the State (or Commonwealth) of _____________________________.

and having a usual place of business at ________________________________________________
__________________________________________________________________________________

as Principal, and ____________________________________________
, a corporation duly organized
under the Laws of the State (or Commonwealth) of _____________________________.

and having a usual place of business at ________________________________________________
as Surety, are holden and stand firmly bound and obligated unto City of Quincy, Massachusetts, as

obligee, in the sum of

lawful money of the United States of America, to and for the true payment whereof we bind ourselves
and, each of us, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly
by these presents.

WHEREAS, the Principal, be means of a written AGREEMENT (which together with the Contract
Documents in said AGREEMENT referred to are collectively sometimes referred to as the "Contract")
dated ________________________, has entered into a contract with the said obligee for FY19 Water
Main Contract 1, in the City of Quincy, Massachusetts, a copy of which agreement is attached hereto and
by references made a part hereof.

NOW THEREFORE, THE CONDITION of this obligation is such that if the Principal shall well and
truly keep and fully and faithfully perform all of the terms and conditions of said AGREEMENT and of
the "Contract Documents" referred to in said AGREEMENT (which collectively are hereinafter and in
said AGREEMENT sometimes referred to as the "Contract") and all modifications thereof on the
Principal's part to be performed, this obligation shall be void; otherwise it shall remain in full force and
effect.

Whenever the said Principal shall be, and declared by the Owner to be, in default under the said Contract,
the Owner having performed the Owner's obligations thereunder Surety, for value received, shall
promptly remedy the default, or, at the option of the Owner, shall promptly.

(a) Complete the said AGREEMENT and/or Contract in accordance with its terms and conditions, or

(b) Obtain a bid or bids for submission to and the approval of the Owner for completing the said AGREEMENT and/or Contract and any modifications thereof in accordance with the terms and conditions thereof, and upon determination by the Owner and the Surety of the lowest responsible and acceptable bidder, arrange for a contract between such bidder and the Owner, and make available to the Owner as the work progresses (even though there should be default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less a sum that shall be equal to the difference between the Contract price as fixed and provided in said AGREEMENT and/or Contract or any modifications thereof to be pair thereunder to the Principal and the amount previously paid by the Owner to and/or for the account of and/or chargeable against the Principal, but not exceeding (including other costs and damages for which the Surety may be liable hereunder) the amount set forth in the first paragraph hereof.

The Surety, for value received, agrees further that no changes in, omissions from, or alterations, modifications or additions to the terms and provisions of said AGREEMENT and/or Contract or the Work to be performed thereunder, and that no extensions of time given or changes made in the manner or time of making payments thereunder, shall in any way effect the Surety's obligations on this bond, and the Surety hereby waives notice of any such changes, omissions, alterations, modifications, additions or extensions.

No right of action shall accrue on this Bond to or for the use of any persons other than the Owner named herein or the heirs, executors, administrators, successors and assigns of the Owner.
IN WITNESS WHEREOF, we have hereunto set our hands and seals to ______________________
______________ counterparts of this bond, this ________________ day of ___________________,
in the year Two Thousand and ________________________________________.

__________________________________ (SEAL)
Principal

__________________________________ (SEAL)
Principal

__________________________________ (SEAL)
Principal

__________________________________ (SEAL)
Surety

__________________________________ (SEAL)
Surety

NOTE:

If the Principal (Contractor) is a partnership, the Bond should be signed by each of the partners.

If the Principal (Contractor) is a corporation, the Bond should be signed in its correct corporate name by
its duly authorized officer or officers.

If this Bond is signed on behalf of the Surety by an attorney-in-fact, there should be attached to it a duly
certified copy of his power of attorney showing his authority to sign such Bonds.

There should be executed an appropriate number of counterparts of the Bond corresponding to the
number of counterparts of the AGREEMENT.

Date of Bond must not be prior to the date of Contract.

Important

Surety Companies executing BONDS must appear on the U.S. Treasury Department's most current list of
"Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as
Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff Bureau of
Accounts and be authorized to transact business in the state where the PROJECT is located.

The attention of the Surety Companies and Principal executing this Performance Bond is Directed to the
fact that said Bond shall remain in full effect throughout the life of any guaranty or warranty periods
stipulated in the Contract Documents and/or Agreement.
LABOR AND MATERIALS BOND

(NOTE: This Bond is issued simultaneously with the attached Performance Bonds in favor of the Owner.)

KNOW ALL MEN BY THESE PRESENTS:

That we, ______________________________________________________________________
(an individual, a partnership, a corporation)
duly organized under the Laws of the State (or Commonwealth) of _______________________.
having a usual place of business at __________________________________________________,
_______________________________________________________________________________,
as Principal, and ________________________________________a corporation duly organized
under the Laws of the State (or Commonwealth) of _________________________________,
and having a usual place of business at _______________________________________________,
as Surety, are holden and stand firmly bound and obligated unto the City of Quincy
Massachusetts, as obligee, in the sum of ____________________________________________
lawful money of the United States of America, to and for the true payment whereof we bind
ourselves and, each of us, our heirs, executors, administrators, successors, and assigns, jointly
and severally, firmly by these presents.

WHEREAS, the Principal, be means of a written AGREEMENT (which together with the Contract
Documents in said AGREEMENT referred to are collectively sometimes referred to as the "Contract")
dated _____________________, has entered into a contract with the said obligee for FY19 Water
Main Contract 1, in the City of Quincy, Massachusetts, a copy of which agreement is attached hereto and
by references made a part hereof.

NOW, THEREFORE, THE CONDITION of this obligation is such, that if the Principal shall promptly
make payments to all claimants as hereinafter defined, for all labor performed or furnished and for all
materials and equipment furnished for or used in or in connection with the Work called for by said
AGREEMENT and/or Contract and any modifications thereof, including lumber used but not
incorporated in said Work, and for the rental or hire of vehicles, tools and other appliances and equipment
furnished for or used in connection with said Work, this obligation shall be void; otherwise it shall remain
in full force and effect, subject, however, to the following conditions:

(a) A claimant is defined as one having a direct contract with the Principal or with a
subcontractor of the Principal for labor, materials and/or equipment used or reasonably
required for use in the performance of the said Work, labor and materials being construed to
include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental or
equipment directly applicable to the said AGREEMENT and/or Contract and any
modifications thereof.
(b) The above named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials or equipment were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The Owner shall not be liable for the payment of any costs or expenses of any such suit.

(c) No suit or action shall be commenced hereunder by any claimant.

Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: the Principal, the Owner, or the Surety above named, within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials or equipment for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials or equipment were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, Owner or Surety at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the said Work is located, save that such service need not be made by a public officer;

After the expiration of one (1) year following the date on which the Principal ceased work on said AGREEMENT and/or Contract and any modifications thereof, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the State in which the said Work, or any part thereof, is situated, or in the United States District Court for the district in which the said Work, or any part thereof, is situated, and not elsewhere.

(d) The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics liens which may be filed of record against said AGREEMENT and/Contract or said Work, whether or not claim for the amount of such lien be presented under and against this bond.

The surety, for value received, agrees further that no changes in, omissions from, or alterations, modifications or additions to the terms and provisions of said AGREEMENT and/or Contract or the Work to be performed thereunder, and that no extensions of time given or changes made in the manner or time of making payments thereunder, shall in any way affect the Surety's obligations on this Bond, and the Surety hereby waives notice of any such changes, omissions, alterations, modifications, additions or extensions.
IN WITNESS WHEREOF, we have hereunto set our hands and seals to ______________________
counterparts of this Bond, this ________________ day of ______________________________, in
the year Two Thousand and ________________________________.

__________________________________ (SEAL)
Principal

__________________________________ (SEAL)
Principal

__________________________________ (SEAL)
Principal

__________________________________ (SEAL)
Surety

__________________________________ (SEAL)
Surety

NOTE:
If the Principal (Contractor) is a partnership, the Bond should be signed by each of the partners.

If the Principal (Contractor) is a corporation, the Bond should be signed in its correct corporate name by
its duly authorized officer or officers.

If this Bond is signed on behalf of the Surety by an attorney-in-fact, there should be attached to it a duly
certified copy of his power of attorney showing his authority to sign such Bonds.

There should be executed an approximate number of counterparts of the Bond corresponding to the
number of counterparts of the AGREEMENT.

Date of Bond must not be prior to the date of Contract.

Important

Surety Companies executing BONDS must appear on the Treasury Department’s most current
list (Circular 570 as amended) and be authorized to transact business in the state where the PROJECT is
located.

The attention of the Surety Companies and Principal executing this Labor and Materials Bond is directed
to the fact that said Bond shall remain in full effect throughout the life of any guaranty or warranty
periods stipulated in the Contract Documents and/or Agreement.
CERTIFICATE OF ACKNOWLEDGMENT OF CONTRACTOR IF A CORPORATION

For CONTRACT BONDS

State of ______________________

County of ____________________

On this _________________ day of _______________________, 20 ___________, before me personally came _______________________________ to me known, who being by me duly sworn, did depose and say as follows:

That he resides at ______________________________________________________________

and is the ________________________________________________________________

of _________________________________________________________________________

the corporation described in and which executed the foregoing instrument; that he knows the corporate seal of said corporation; that the seal affixed to the foregoing instrument is such corporate seal and it was so affixed by order of the Board of Directors of said corporation; and that by the like order he signed thereto his name and official designation.

________________________________

Notary Public      (Seal)

My commission expires __________________________
STATE TAX CERTIFICATE

Pursuant to M.G.L., Ch. 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.

Social Security Number * Or Federal Identification Number *

Signature of Individual or Corporate Name

by: ________________
Corporate Office (if applicable)

* Submission of a Social Security Number or a Federal Identification Number is voluntary.
SECTION 00700

GENERAL CONDITIONS

1.01 General Provisions

A. The duties and obligations imposed by these General Conditions will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply.

B. Sections of Division 1, General Requirements govern the execution of the Work of all sections of the specifications.

C. The Specifications are written in imperative and streamlined form. This imperative language is directed to the Contractor, unless stated otherwise.

1.02 Definitions

A. Wherever the words as listed in subsection 1.01 of the AGREEMENT or pronouns used in their stead occur in the Contract Documents, they shall have the meanings as given in the AGREEMENT.

1.03 Materials and Equipment

A. General

1. The City of Quincy will not provide staging areas for the Contractor’s use. The Contractor is solely responsible for obtaining any required staging areas for their use.

2. Unless otherwise provided in the Contract Documents, only new materials and equipment shall be incorporated in the Work.

3. As soon as possible after execution of the AGREEMENT, submit to the Engineer the names and addresses of the manufacturers and suppliers of all materials and equipment proposed to be incorporated into the Work.

4. When shop and working drawings are required as specified below, submit, prior to the submission of such drawings, data in sufficient detail to enable the Engineer to determine whether the manufacturer and/or the supplier have the ability to furnish a product meeting the Specifications.

5. Submit data relating to the materials and equipment proposed to be incorporated into the Work in sufficient detail to enable the Engineer to identify and evaluate the particular product and to determine whether it conforms to the Contract requirements. Such data shall be submitted in a manner similar to that specified for submission of shop and working drawings.

B. Handling
1. Handle, haul, and distribute materials and all surplus materials on the different portions of the Work, required to complete the Work in accordance with the Contract Documents.

2. Provide suitable storage room for materials and equipment during the progress of the Work, and be responsible for the protection, loss of, or damage to materials and equipment furnished under this Contract, until the final completion and acceptance of the Work.

3. Pay all storage and demurrage charges by transportation companies and vendors.

C. Storage of Excavated Material

1. Place excavated materials and equipment to be incorporated in the Work so as not to injure any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the Work.

2. Materials shall be kept neatly piled and compactly stored in such locations as will cause a minimum of inconvenience to public travel and adjoining owners, tenants and occupants.

D. Inspection

1. All materials and equipment furnished by the Contractor to be incorporated in the Work shall be subject to the inspection of the Engineer.

2. No material shall be processed or fabricated for the Work or delivered to the work site without prior concurrence of the Engineer.

3. Facilities and labor for the storage, handling, and inspection of all materials and equipment shall be furnished by the Contractor.

4. Defective materials and equipment shall be removed immediately from the site of the Work.

E. Inspection away from Site

1. If work to be done, away from the construction site, is to be inspected on behalf of the Owner during its fabrication, manufacture, or testing, or before shipment, the Contractor shall give notice to the Engineer of the place and time where such fabrication, manufacture, testing, or shipping is to be done. Such notice shall be in writing and delivered to the Engineer in ample time, as determined solely by the Engineer, so that the necessary arrangements for the inspection can be made.

F. Samples

1. Submit samples of materials for tests, as the Engineer deems necessary to demonstrate conformance with the Specifications. Such samples, including concrete test cylinders, shall be furnished, taken, stored, packed, and shipped by the Contractor as directed by the Engineer.

2. Furnish suitable molds for making concrete test cylinders. Except as otherwise expressly specified, the Owner shall make arrangements for, and pay for, the tests.

3. Pack samples so as to reach their destination in good condition, and label to indicate the material represented, the name of the building or work and location for which the material is intended, and the name of the Contractor submitting the sample. To ensure consideration of samples, notify the Engineer by letter that the samples have been shipped and properly describe the samples in the letter. Send letter of notification separate from the samples.

4. Submit data and samples, or place his orders, sufficiently early to permit consideration, inspection and testing before the materials and equipment are needed for incorporation in the Work. The consequences for failure to do so shall be the Contractor's sole responsibility.

5. In order to demonstrate the proficiency of workmen, or to facilitate the choice among several textures, types, finishes, surfaces, etc., provide such samples of workmanship of wall, floor, finish, etc., as may be required.

6. After review of the samples, data, etc. the materials and equipment used for the Work shall in all respects conform therewith.

G. Shop Testing

1. When required, furnish to the Engineer in triplicate, sworn copies of manufacturer's shop or mill tests (or reports from independent testing laboratories) relative to materials, equipment performance ratings, and concrete data.

1.04 CONTRACTOR'S SHOP AND WORKING DRAWINGS

A. Submit shop drawings to the Engineer for review and approval.

B. All submittals will be identified as the Engineer may require and in the number of copies also as required by the Engineer.
C. The data shown on the Shop Drawings will be complete regarding quantities, dimensions, specified performance and design criteria, materials and other data as particular to the Work that the Contractor proposes to provide.

1.05 OCCUPYING PRIVATE LAND

A. Entering or occupying with men, tools, materials, or equipment, any land outside the rights-of-way or property of the Owner (except after written consent from the proper parties) will not be permitted. A copy of the written consent shall be given to the Engineer.

1.06 INTERFERENCE WITH AND PROTECTION OF STREETS

A. Obtain permits from the governing authorities prior to obstructing any portion of a street, road, or private way. If any street, road or private way is rendered unsafe by the Contractor's operations, he shall make such repairs or provide such temporary ways or guards as ordered by the governing authorities.

B. Maintain streets, roads, private ways, and walks not closed in a passable and safe condition,

C. Provide at least 24 hours in advance, notice to the Owner, Police, Fire and School Departments in writing, with a copy to the Engineer, if the closure of a street or road is necessary. Cooperate with all Departments in the establishment of alternate routes and provide adequate detour signs, plainly marked and well lighted, in order to minimize confusion.

1.07 SAFETY

A. Take all precautions and provide safeguards to prevent personal injury and property damage. Provide protection for all persons including but not limited to employees and employees of other contractors and subcontractors; members of the public; and employees, agents and representatives of the Owner, the Engineer, and regulatory agencies that may be on or about the Work. Provide protection for all public and private property including but not limited to structures, pipes, and utilities, above and below ground.

B. Provide and maintain all safety equipment such as fences, barriers, signs, lights, walkways, guards and fire prevention and fire-fighting equipment.

C. Comply with all applicable Federal, State and local laws, ordinances, rules and regulations and lawful orders of all authorities having jurisdiction for the safety of persons and protection of property.

D. Designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This responsible person shall have the authority to take immediate action to correct unsafe or hazardous conditions and to enforce safety precautions and programs.

1.08 EXISTING FACILITIES

A. Dimensions of Existing Structures

1. Where the dimensions and locations of existing structures are of importance in the installation or connection of any part of the Work, verify such dimensions and locations in the field before the fabrication of any material or equipment which is dependent on the correctness of such information.

B. Proposed Pipe Location

1. Exterior pipelines will be located substantially as indicated on the Drawings, but the right is reserved to the Owner, acting through the Engineer, to make such modifications in location as may be found desirable to avoid interference with existing structures or for other reasons. Where fittings, etc., are noted on the Drawings, such notation is for the Contractor's convenience and does not relieve him for laying and jointing different or additional items where required.

2. Small interior piping is indicated diagrammatically on the Drawings, and the exact location is to be determined in the field. Piping shall be arranged in a neat, compact, and workmanlike manner, with a minimum of crossing and interlacing, so as not to interfere with equipment or access way, and, in general, without diagonal runs.

C. Interference with Existing Works

1. Conduct operations so as to interfere as little as possible with existing works. Develop a program, in cooperation with the Engineer and interested officials, which shall provide for the construction and putting into service of the new works in the most orderly manner possible. This program shall be adhered to except as deviations therefrom are expressly permitted. All work of connecting with, cutting into, and reconstructing existing pipes or structures shall be planned to interfere with the
operation of the existing facilities for the shortest time when the demands on the facilities best permit such interference, even though it may be necessary to work outside of normal working hours to meet these requirements. Electrical connections should be coordinated with the Owner so as to minimize disruption of normal plant operations. Before starting work which will interfere with the operation of existing facilities, perform preparatory work and see that all tools, materials and equipment are made ready and at hand.

2. Repair utilities damaged by the Contractors operations during the progress of the work, and be responsible for correcting all damages to existing utilities and structures at no additional expense to the Owner. Contact the proper utility or authority to correct or make any changes due to utility or other obstructions during the work but the entire responsibility and expense shall be with the Contractor.

3. Make such minor modifications in the work relating to existing structures as may be necessary, without additional compensation.

4. Submit no claim for additional compensation by reason of delay or inconvenience in adapting his operations to the need for continuous flow of sewage.

D. Existing Utilities or Connections

1. The location of existing underground pipes, conduits, and structures, as shown, has been collected from the best available sources. The Owner, together with its agents, does not imply nor guarantee the data and information in connection with underground pipes, conduits, structures and such other parts as to their completeness, nor their locations as indicated. The Contractor shall assume that there are existing water, sewer, gas and other utility connections to each and every building enroute, whether they appear on the drawings or not. An expense and/or delay occasioned by utilities and structures, or damage thereof, including those not shown, shall be the responsibility of the Contractor, at no additional expense to the Owner.

2. Above ground utilities may be present in the areas of the proposed Work. Take all necessary actions and/or precautions, including, but not limited to, utility company notification and necessary relocations (both temporary and permanent), to insure proper protection of those aboveground utilities and appurtenances to be affected by his operations. All costs associated with the aboveground utilities shall be paid by the Contractor at no additional expense to the Owner.

3. If and when encountered, existing utilities shall be properly supported and protected during the construction work and the Engineer shall be notified accordingly. The operation of existing utilities shall not be interrupted except with written permission of the operator and owner of such utilities. Allow ample time for all measures as may be required for the continuance of existing utility operations. Take extreme precautions to minimize disruption of utilities. Make prompt and full restitution for repairs by others for all disruptions caused by operations required to perform the Work.

4. Comply with all requirements of utility organizations involved.

E. Failure to Repair

1. Any emergency rising from the interruption of electric, telephone, gas, water, or sewer service due to the activities of the Contractor, shall be repaired by the Contractor as quickly as is possible.

2. If and when, in the opinion of the Owner, the Contractor is not initiating repair work as expeditiously as possible upon notification to do so, the Owner, may at his own option, make the necessary repairs using his own forces or those of others. The cost of such repairs shall be subtracted from the payments due to the Contractor.

F. Disturbance of Bounds

1. Replace all bounds disturbed during the construction operation, at no additional cost to the Owner. The bounds shall be relocated by a land surveyor approved by the Engineer and registered in the State that the Work is to be done.

1.09 WORK TO CONFORM

A. During its progress and on its completion, the Work shall confirm to the lines, levels, and grades indicated on the Drawings or given by the Engineer and shall be built in strict accordance with the Contract Documents and the directions given from time to time by the Engineer.

B. All work done without instructions having been given therefore by the Engineer, without proper lines or levels, or performed during the absence of the Engineer, will not be estimated or paid for except when such work is authorized by the Engineer in writing. Work so done may be ordered uncovered or taken down, removed, and replaced at the Contractor's expense.
1.10 PLANNING AND PROGRESS SCHEDULES

A. Before starting the Work and from time to time during its progress, as the Engineer may request, the Contractor shall submit to the Engineer a written description of the methods he plans to use in doing the Work and the various steps he intends to take.

B. Within 14 calendar days after the date of formal execution of the AGREEMENT, the Contractor shall prepare and submit to the Engineer (a) a written schedule fixing the dates on which additional drawings, if any, will be needed by the Contractor and (b) a written schedule fixing the respective dates for the start and completion of various parts of the Work. Each such schedule shall be subject to review from time to time during the progress of the Work.

1.11 PRECAUTIONS DURING ADVERSE WEATHER

A. During adverse weather and against the possibility thereof, take all necessary precautions so that the Work may be properly done and satisfactory in all respects. When required by the manufacturer of the material or equipment to be installed, protection shall be provided by use of tarpaulins, wood and building-paper shelters, or other suitable means.

B. During cold weather, materials shall be preheated, if required, and the materials and adjacent structure into which they are to be incorporated shall be made and kept sufficiently warm so that a proper bond will take place and a proper curing, aging, or drying will result. Protected spaces shall be artificially heated by suitable means that will result in a moist or dry atmosphere according to the particular requirements of the work being protected. Ingredients for concrete and mortar shall be sufficiently heated so that the mixture will be warm throughout when used.

1.12 TEMPORARY HEAT

A. If temporary heat is required for the protection of the Work, provide and install suitable heating apparatus, provide adequate and proper fuel, and shall maintain heat as required.

B. Temporary heating apparatus shall be installed and operated in such manner that finished work will not be damaged.

1.13 ELECTRICAL ENERGY

A. Make all necessary applications and arrangements and pay all fees and charges for electrical energy for power and light necessary for the proper completion of the Work and during its entire progress. Provide and pay for all temporary wiring, switches, connections, and meters.

B. Provide sufficient electric lighting so that all work may be done in a workmanlike manner when there is not sufficient daylight.

1.14 CERTIFICATES OF CONFORMANCE

A. Furnish to the Engineer, in the manner as directed and prior to actual installation, notarized certificates of conformance for all materials to be furnished under this Contract. The notarized certificates of conformance shall state that the material to be furnished meets or exceeds all requirements specified under the Contract Documents. When so directed, the manufacturer’s notarized certificates of conformance, certifying that the materials meet the requirements specified shall accompany each shipment of material. Unless otherwise specifically specified and/or directed by the Engineer, all testing of materials required under this Contract shall be provided by the Contractor at no additional expense to the Owner.

1.15 PATENTS

A. Pay, at no additional expense to the Owner, all applicable royalties and license fees associated with the materials and construction methods to be used under this Contract. Defend all suits or claims for infringements of any patent rights, and save the Owner and Engineer harmless from loss on account thereof, except that the Owner shall be responsible for any such loss when a particular process, design, or product of a particular manufacturer (s) is specifically specified with no option to the Contractor. However, if the Contractor 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.

B. Refer to Specification Section 00500 Article 1.07, Patents, regarding the Contractor's responsibilities for any patent rights associated with the materials and construction methods to be used under this Contract.
1.16 "OR EQUAL" CLAUSE

A. Whenever a material or article required is specified or shown on the drawings by using the name of the proprietary product of a particular manufacturer or vendor, any material or article which will perform adequately, in the Engineer’s sole judgment and/or opinion, the duties imposed by the general design may be considered equal and satisfactory providing the material or article so proposed is of equal substance. It shall not be purchased or installed without his written approval. In all cases new material shall be used in the project.

B. If more than one brand, name of material, device, or piece of equipment is shown or specified, each should be regarded as the equal of the other. Any other brand, make of material, device or equipment, which in the opinion of the OWNER and/or ENGINEER, is the recognized equal of that specified (considering quality, workmanship, and economy of operation), and is suitable for the purpose intended, may be accepted.

C. ENGINEER will be allowed a reasonable time within which to evaluate submittals for Substitute Items. ENGINEER will be the sole judge of acceptability. No “Or Equal” or Substitute Item will be ordered, installed or utilized without ENGINEER’s prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. OWNER may require CONTRACTOR to furnish at CONTRACTOR’s expense a special performance guarantee or other surety with respect to any “or equal” or substitute. ENGINEER will record time required by ENGINEER and ENGINEER’s Consultants in evaluating substitutes proposed or submitted by CONTRACTOR and in making changes to the Contract Documents. Whether or not ENGINEER accepts a Substitute Item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER’s Consultants for evaluating each such proposed Substitute Item.

1.17 ADDITIONAL OR SUBSTITUTE BONDS

A. If at any time the Owner, for justifiable cause, shall be or become dissatisfied with any Surety or Sureties than upon the performance or payment bonds, the Contractor shall, within five (5) calendar days after notice from the Owner so to do, substitute an acceptable bond (or bonds) in such form and sum and signed by such other Surety or Sureties as may be acceptable to the Owner. The Contractor shall pay the premiums on such bonds with no additional expense to the Owner. No further payments shall be deemed due nor will be made until the new Surety or Sureties shall have furnished such as acceptable bond to the Owner.

1.18 SEPARATE CONTRACTS

A. The Owner reserves the right to let other contracts in connection with the construction of the contemplated work of this project or contiguous projects of the Owner. The Contractor, therefore, will afford any such other contractors reasonable opportunity for the introductions and storage of their materials and the execution of their work, will properly connect and coordinate his work with theirs, and will not commit or permit any act which will interfere with the performance of their work.

B. Coordinate operations with those of other contractors. Cooperation will be required in the arrangement for the storage of materials and in the detailed execution of the work.

C. It is essential that all parties interested in the project cooperate to the end that the entire project will be brought to a successful conclusion as rapidly as possible, but the Owner cannot guarantee that no interference or delay will be caused thereby. Interference and delay resulting from such cooperation shall not be basis of claims against the Owner.

1.19 PAYROLLS OF CONTRACTOR AND SUBCONTRACTORS

A. The Contractor and each of his Subcontractors shall prepare his payrolls on forms prescribed and in accordance with instructions to be furnished by the Owner. Within seven (7) days after the regular payment date of the payroll, the Contractor shall deliver to the Owner, with copies to the Engineer, a certified legible copy or copies of each such payroll. Each such payroll shall contain the statement required by the Federal Regulations issued pursuant to the "Anti-Kickback Statute", (48 Stat. 948; 18 U.S.C. 874; 40 U.S.C. 276C).

B. Carrying any person on his payrolls not employed by him will not be permitted. Carrying employees of a subcontractor on his payrolls will not be permitted, but such employees must be carried on the payrolls of the employing subcontractor.
C. Each Contractor or Subcontractor shall preserve his weekly payroll records for a period of three (3) years from the date of completion of the Contract. The payroll records shall set out accurately and completely the name, occupational classification, and hourly wage rate of each employee, hours worked by him during the payroll period and full weekly wages earned by him, and deductions made from such weekly wages and the actual weekly wages paid to him. Such payroll records shall be made available at all times for inspection by the Owner or his authorized representatives, the Engineer or by agents of the United States Department of Labor.

1.20 PAYMENTS BY CONTRACTOR

A. Pay for all traffic control, safety, transportation and utility services not later than the 20th day of the calendar month following that in which services are rendered. Reimbursable costs for services rendered, as specified in the Contract Documents, shall not be incorporated into partial payment estimates until such time that the Contractor submits to the Engineer actual paid invoices from those in which services were rendered.

1.21 “DIG SAFE” LAW

A. Before proceeding with construction operations, the Contractor shall notify the State of Massachusetts Underground Plant Damage Prevention Systems (DIG SAFE at 811), and shall make such supplemental investigations, including exploratory excavations, by hand digging, as he deems necessary to uncover and determine the exact locations of utilities and structures, and shall have no claims for damages due to encountering subsurface structures or utilities in locations other than that shown on the drawings, or which were made known to the Contractor prior to construction operations. The Contractor shall be responsible and liable for all damages to the existing utilities and structures.

B. Before commencing with the construction of any work, identify any water main, gas main, telephone duct, electric duct, and/or other utility present which is or could be in conflict with the proposed work.

C. Relocation of the affected utilities shall be done as directed by the Owner and in accordance with the requirements of the utility company.

D. The attention of the Contractor is directed to the fact that certain utility companies may not fall under the provisions of “DIG SAFE”. Individual utility company notifications by the Contractor shall be necessary to insure proper notification and protection of all existing utilities affected by this Contract.

1.22 FIRE PREVENTION AND PROTECTION

A. State and municipal rules and regulations with respect to fire prevention, fire-resistant construction and fire protection shall be strictly adhered to and all work and facilities necessary therefore shall be provided and maintained by the Contractor in an approved manner.

B. Provide fire protection equipment such as water tanks, hoses, pumps, extinguishers, and other materials, and apparatus, for the protection of the contract work, and adjacent property. Trained personnel experiences in the operation of all fire protection equipment and apparatus shall be available on the site whenever work is in progress, and at such other times as may be necessary for the safety of the public and the work.

1.23 DUST CONTROL

A. Exercise every precaution and means to prevent and control dust arising out of all construction operations from becoming a nuisance to abutting property owners or surrounding neighborhoods. Pavements adjoining pipe trench shall be kept clean of excess materials wherever and whenever directed by the Engineer. Repeated daily dust control treatment shall be provided to satisfactorily prevent the spread of dust until permanent pavement repairs are made and until earth stockpiles have been removed, and all construction operations that might cause dust have been completed. No extra payment will be made for dust control measures, compensation shall be considered to be included in the prices stipulated for the appropriate items as listed in the Bid.

1.24 DISPOSAL OF DEBRIS

A. The materials from the demolition, and those used in the construction of the Work throughout the project, shall be deposited in such a manner so as to not endanger persons or the Work, and so that free access may be had at any time to all hydrants, gates and existing equipment in the vicinity of the work. The materials shall be kept trimmed-up so as to be of as little inconvenience as possible to the public travel and plant operations. All excavated materials not approved for backfill and fill, all surplus material,
and all rock and boulders resulting from the excavations, shall be removed and satisfactorily disposed of off the site by the Contractor, at no additional expense to the Owner.

B. The materials being removed from the pipelines and manholes during the cleaning process shall be deposited in such a manner as to not endanger the public, plant personnel or persons performing the work. Such debris deposits may be of such nature, high in biological organic contents, or chemically aggressive that they will require proper disposal in a safe, health risk free, environment. Contact the Owner and Engineer and all agencies having jurisdiction thereof, for approval of debris disposal methods and locations of disposal, prior to disposing of any or all debris removed from pipe cleaning methods. All debris shall be removed and satisfactorily disposed of off the work site, at no additional expense to the Owner.

1.25 NIGHT, SATURDAY, SUNDAY AND HOLIDAY WORK

A. No work shall be done at night or on Saturdays, or Sundays or holidays without the prior written approval of the Owner and Engineer.

1.26 LENGTH OF WORK DAY

A. Work hours will be 7:30 AM to 3:30 PM, Monday through Friday, except where otherwise stated. The Owner retains the right to restrict the Contractor to an eight-hour workday. Such restrictions shall not be the basis for damages or claims against the Owner.

B. The Contractor's attentions is also directed to the fact that should it be deemed necessary to perform various items of work during off-peak flow or traffic hours, early morning or late night hours, then he shall notify the Engineer a minimum of 24 hours in advance as to his intentions and reasons for the change in work hours. The Contractor shall be responsible for properly contacting and informing all involved parties of such a change in work hours. The Contractor shall not be entitled to any additional compensation from the Owner for any expenses that may be incurred by change of working hours and/or scheduling.

1.27 HURRICANE PROTECTION

A. Should hurricane warnings be issued, the Contractor shall take every practicable precaution to minimize danger to persons, to the work and to adjacent property. These precautions shall include closing all openings; removing all loose materials, tools and/or equipment from exposed locations; and removing or securing scaffolding and other temporary work.

1.28 REDUCTION IN SCOPE OF WORK

A. The Owner reserves the right to decrease the scope of the work to be done under this Contract and to omit any work should the Owner deem it to be in the public interest to do so. To this end, the Owner reserves the right to reduce the quantity of any items or omit all of any as set forth in the BID, either prior to executing the contract or at any time during the progress of the work. The Owner further reserves the right, at anytime during the progress of the work, to restore all or part of any items previously omitted or reduced. Exercise by the Owner of the above rights shall not constitute any ground or basis of claim for damages or for anticipated profits on the work omitted.
SECTION 00800
SUPPLEMENTARY CONDITIONS

1.01 General
1.02 Limits of Normal Excavation
1.03 Bolts, Anchor Bolts, and Nuts
1.04 Covering Excavated Trench
1.05 Maintaining Trench Excavations
1.06 Disruption of Storm Drains
1.07 Precaution Against Hydraulic Uplift During Construction
1.08 Blasting
1.09 Special Safety Precautions
1.10 Land, Easements and Rights-of-Way
1.11 Cleaning Finished Work

1.01 GENERAL
A. These Supplementary Conditions are requirements which amend or supplement the General Conditions specified elsewhere.

B. The duties and obligations imposed by these Supplementary Conditions will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply.

C. Assertion of any claim for any additional compensation or damages on account of and/or the fulfillment of these Supplementary Conditions will not be allowed.

1.02 LIMITS OF NORMAL EXCAVATION
A. In determining the quantities of excavation to which unit prices shall apply, the limits of normal width and depth of excavation shall be as described below, unless other limits are indicated in the Contract Documents.

B. For pipes in trench, the normal width of the trench shall be measured between vertical planes which are a distance apart equal to the sum of 18 inches plus 1-1/3 times the nominal inside diameter of the pipe. If the width so computed is less than 3.0 feet, a width of 3.0 feet shall be taken as the normal width for payment. The normal depth shall be measured to a distance of 0.5 feet below the bottom of the pipe in earth and 0.5 feet in rock, unless there be a cradle underneath the pipe, in which case the normal depth shall be measured to the underside of the cradle. The trench width for the cradle shall be assumed to be that specified above for pipes in the trench.

C. For concrete placed directly against undisturbed earth, the normal width and depth of the excavation for such concrete shall be measured to the neat lines of the concrete as indicated on the Drawings or as ordered.

D. For concrete placed against rock surfaces resulting from rock excavation, the normal width and depth of the excavation shall be measured to 4 inches outside the neat lines of the concrete as indicated on the Drawings or as ordered.

E. For other structures, except manholes as noted below, the normal width shall be measured between vertical planes 1.0 feet outside the neat lines of the several parts of the structure, except that the width at any elevation shall be measured as not less than the width at a lower elevation. The normal depth shall be measured to the underside of that part of the structure for which the excavation is made.

F. No additional width or depth of trenches excavated in earth or rock shall be allowed at standard circular manholes. The pay limit for rock removed outside proposed manholes shall commence one foot (1.0) outside the widest dimension of the structure or shall be the maximum connecting trench width, whichever is greater.

G. Wherever bell holes are required for jointing pipe, they shall be provided without additional compensation over and above that resulting from measurements as above described.

1.03 BOLTS, ANCHOR BOLTS AND NUTS
A. Furnish bolts, anchor bolts, nuts, washers, plates and bolt sleeves required by equipment to be installed under this Contract in accordance herewith. Anchor bolts shall have suitable washers and, where so required, their nuts shall be hexagonal.

B. Anchor bolts, nuts, washers, plates, and bolt sleeves shall be galvanized unless otherwise indicated or specified.
C. Expansion bolts shall have malleable iron and lead composition elements of the required number of units and size.

D. Unless otherwise specified, stud, tap, and machine bolts, and nuts shall conform to the requirements of ASTM Standard Specification for Carbon Steel Externally and Internally Threaded Standard Fasteners, Designation A307. Hexagonal nuts of the same quality of metal as the bolts shall be used. All threads shall be clean cut and shall conform to ANSI Standard B1.1-1974 for Unified Inch Screw Threads (UN and UNR Thread Form).

E. Bolts, anchor bolts, nuts and washers, specified to be galvanized, shall be zinc coated, after being threaded, by the hot-dip process in conformity with the ASTM Standard Specification for Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed and Forged Steel Shapes, Plates, Bars and Strip, Designation A123, or the ASTM Standard Specifications for Zinc Coating (Hot Dip) on Iron and Steel Hardware, Designation A153, as is appropriate.

F. Bolts, anchor bolts, nuts, and washers specified to be stainless steel shall be Type 316 stainless steel unless otherwise indicated or specified.

G. Anchor bolts and expansion bolts shall be set accurately. If anchor bolts are set before the concrete has been placed, they shall be carefully held in suitable templates of acceptable design. Where indicated on the Drawings, specified, or required, anchor bolts shall be provided with square plates at least 4 inches by 4 inches by 3/8 inches or shall have square heads and washers and be set in the concrete forms with suitable pipe sleeves, or both. If anchor or expansion bolts are set after the concrete has been placed, all necessary drilling and grouting or caulking shall be done by the Contractor and care shall be taken not to damage the structure or finish by cracking, chipping, spalling, or otherwise during the drilling and caulking.

1.04 COVERING EXCAVATED TRENCH

A. In addition to the requirements in Section 00700 titled Interference with and Protection of Streets. Cover all open excavations when construction operations are suspended at the end of the day, or in excavated trenches where work is not actually in progress. Cover shall be capable of withstanding AASHTO H20-$S16 loading. This cover shall consist of steel plates or some other satisfactory cover of adequate size and strength suitably held in place to keep all traffic out of excavations, all as verified in writing by the Contractor. The cover shall be laid over the excavation until it is backfilled.

1.05 MAINTAINING TRENCH EXCAVATIONS

A. The length of trench opened at any time, from point where ground is being broken to completed backfill, and also the amount of space in streets or public and private lands occupied by equipment, trench, and supplies, shall not exceed the length of space considered reasonably necessary and expedient by the Engineer. In determining the length of open trench or spaces for equipment, materials, supplies and other necessities, the Engineer will consider: the nature of the lands or streets where work is being done; types and methods of construction and equipment being used; inconvenience to the public or to private parties; possible dangers; and other proper matters. All work must be constructed with a minimum inconvenience and danger to the public and all other parties concerned.

B. Whenever any trench obstructs pedestrian and vehicular traffic in or to any public street, private driveway or property entrance, or on private property, take such means as may be necessary to maintain pedestrian and vehicular traffic and access. Until such time as the work may have attained sufficient strength to support backfill, or if for any other reason it is not expedient to backfill the trench immediately, construct and maintain suitable plank crossing and bridges to carry essential traffic in or to the street, driveway or property in question, as specified or directed.

C. Suitable signs, lights, and such items required by Police Authorities to direct traffic, shall be furnished and maintained by the Contractor at his own expense.

D. Keep streets and premises free from unnecessary obstructions, debris and all other materials. The Engineer may, at any time, order all equipment, materials, surplus from excavations, debris and all other materials lying outside that length of working space, promptly removed. Should the Contractor fail to remove such material within 24 hours after notice to remove the same, the Owner may cause any part or all of such materials to be removed by such persons as he may employ, at the Contractor's expense; and may deduct the costs thereof from payments which may be or may become, due to the Contractor under the Contract. In special cases, where public safety urgently demands it, the Owner may cause such materials to be removed at the Contractor's expense without prior notice.
1.06 DISRUPTION OF STORM DRAINS
A. Portions of the Work may be located in areas that are serviced by storm drains. Take extreme precaution to minimize disruption of the drains, and repair and/or make restitution for repairs by others for all disruptions caused by the construction operations.

1.07 PRECAUTION AGAINST HYDRAULIC UPLIFT DURING CONSTRUCTION
A. Protect all structures against hydraulic uplift until such structures have beneficially completed.

1.08 BLASTING AND PRE-CONSTRUCTION BLASTING SURVEY
A. Blasting will not be permitted.

1.09 SPECIAL SAFETY PRECAUTIONS
A. Contractor shall take all necessary safety precautions in completing the work including coordinating with and complying with emergency procedures and requirements of the Owner, Police Department, Fire Department, and the Massachusetts Department of Environmental Protection. The Contractor shall comply with all applicable federal, state and local laws, ordinances, rules and regulations and lawful orders of all authorities having jurisdiction for the safety of persons and protection of property. The Contractor shall have all necessary safety apparatus on-site and workers shall be instructed in its use.

1.10 LAND, EASEMENTS, AND RIGHTS-OF-WAY
A. As indicated, a portion of the work may be located within easements and/or rights-of-way, obtained or which will be obtained by the Owner, through private property. On all other lands, the Contractor has no rights unless he obtains them from the proper parties as specified in Section 00700, Occupying Private Land.

B. Prior to issuance of the Notice to Proceed, the Owner shall obtain all land, easements and rights-of-way necessary for carrying out and for the completion of the work to be performed pursuant to the Contract Documents, unless otherwise mutually agreed.

C. The Owner shall provide to the Contractor information which delineates and describes the lands owned and rights-of-way acquired.

D. The Contractor shall provide at his own expense and without liability to the Owner any additional land and access thereto that the Contractor may desire for temporary construction facilities or for storage of equipment and materials.

E. If however, lands, easements or rights-of-way cannot be obtained before work on the project begins, the Contractor shall begin his work upon such land, easements or rights-of-way as have been previously acquired by the Owner, and no claims for damages whatsoever will be allowed by reason of its inability to procure the lands, easements, or rights-of-way for the said work, the Contractor shall not be entitled to make or assert a claim for damages by reason of the said delay, or to withdraw from the Contract except by consent of the Owner. Time for completion of work will be extended to such time as the Owner determines will compensate for the time lost by such delay, such determination to set forth in writing.

1.11 CLEANING FINISHED WORK
A. After the work is completed, the pipes, manholes and structures shall be carefully cleaned free of debris and dirt, broken masonry, and mortar, and left in first class condition, ready to use. All temporary or excess materials shall be disposed of off-site and the work left broom clean, to the satisfaction of the Engineer.

END OF SECTION
SECTION 01010
SUMMARY OF WORK

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Work covered by the Contract, listing of Owner, Project location, Engineer. Sequence requirements, the Contractor’s use of the premises and Owner’s occupancy requirements.

1.02  WORK COVERED BY CONTRACT DOCUMENTS

A. The Work includes, but is not necessarily limited to the construction of approximately 11,000 linear feet of 8-inch ductile iron water mains, including all appurtenances, all as more particularly indicated, shown or described in the Drawings, Specifications, and other Contract Documents.

1.03  OWNER

A. Quincy Department of Public Works
55 Sea Street
Quincy, MA 02169
Telephone: 617-376-1950
Contact: Paul Costello, City Engineer

1.04  PROJECT LOCATION

A. Various Streets
Quincy, Ma 02169

B. Work under this Contract includes replacing water main in the vicinity of the Francis Parker School on Billings Road and the Point Webster Middle School on Lancaster Street. All work in school areas must be conducted between June 18 and September 1.

1.05  ENGINEER

A. BETA Group, Inc.
315 Norwood Park South
Norwood, Massachusetts 02062
Telephone: 781-255-1982
Fax: 781-255-1974
Contact: Andrew Dennehy, PE

1.06  WORK SEQUENCE

A. In order that Work may be conducted with minimum inconvenience to the public and, work under this Contract may be coordinated with other work which may be under construction or contemplated, and that work under the Contract may conform to conditions which it has been undertaken or conditions attached to a right-of-way or particular location for this work, the
Engineer may determine the point or points and time or times when portions of work will commence or be carried on and may issue orders pertaining to the work sequence, relative to the rate of progress on several portions of the work.

B. Construction on mainline street shall be completed in the following sequence

1. Neponset Road
2. Butler Road
3. Calumet Street
4. Freeman Street
5. Vassal Street
6. Tyler Street
7. Flynt Street
8. Lunt Street
9. Fowler Street
10. Alden Street
11. Lowe Street
12. James Street

C. Work hours are Monday through Friday 7:30 AM to 4:30 PM. No idling is allowed prior to 7:30 AM.

1.07 CONTRACTOR USE OF PREMISES

A. The Contractor’s use of premises shall be within the limits shown on the Drawings and as defined in Section 00500 – Contract Agreement, for the performance of the Work.

B. The Contractor shall assume full responsibility for security of all materials and equipment on the site, including those of his subcontractor’s.

C. If directed by the Owner, the Contractor shall move any stored items that interfere with operations of the Owner.

D. Obtain and pay for use of additional storage or work areas if needed to perform the Work.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION
SECTION 01020
ALLOWANCES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes
   1. Contingencies and their respective value which have been established in the BID as an estimated lump sum to facilitate comparison of bids only.

B. Related Sections
   1. Section 00300 - Bid Forms
   2. Section 01025 - Measurement and Payment

1.02 ALLOWANCES

A. Contaminated Soil and Groundwater – Bid Item No. 16
   1. In the event contaminated soil is encountered during construction, provide excavation, stockpile, transport, and disposal of contaminated soil as directed by the Engineer.
   2. In the event contaminated groundwater is encountered during construction, provide treatment and proper discharge of contaminated groundwater as directed by the Engineer.

B. Uniformed Trafficmen- Bid Item No 17.
   1. Coordinate and schedule uniformed trafficmen prior to commencement of work on public ways.

C. Private Property Plumbing and/or Residential Issues – Bid Item No. 18
   1. Provide the services of a residential plumber to address any residential plumbing issues arising from the use of temporary water bypass pipe or installation of new water service and main.
   2. Coordinate all work with the respective plumber at the appropriate time to prevent any delay in the work specified to be done under these Contract Documents.

1.03 PAYMENT PROCEDURES

A. Under these items, the Contractor shall be reimbursed for charges for the allowances required and authorized by the Owner and Engineer, as detailed in Section 01025 - Measurement and Payment.

B. The lump-sum price for allowances is established in Section 00300 - Bid Forms as an estimated figure to facilitate comparison of bids only. The actual amount to be paid under this item shall constitute full compensation for services rendered.

C. The lump-sum price for this item shall NOT include any costs associated with services rendered for routine utility markings, repair damages incurred as a result of the Contractor's operations, relocations of utilities done at the Contractor's request and/or convenience, or any other unauthorized services rendered by utility companies. The purpose of this item is strictly for the Contractor's reimbursement for those services authorized by the Owner or Engineer prior to the work being performed.
D. The Contractor will be paid based on the actual PAID invoiced amount from the authority in question as approved by the Engineer. If the total cost for such charges is greater or less than the allowance amount stated under this item of the BID, a debit or credit of the difference in cost shall be to the Owner.

PART 2 PRODUCTS

2.01 MATERIALS

A. Materials as required and ordered by the Engineer shall conform to the Contract Documents.

PART 3 EXECUTION

3.01 INSTALLATION

A. Installation, relocation, or repair of utilities, shall be performed in accordance with the Contract Documents.

END OF SECTION
PART 1 GENERAL

1.01 SUMMARY

A. Section Includes
   1. Measurement and payment criteria applicable to the Work performed under a unit price and/or lump sum payment method of Items listed in the BID.

B. RELATED SECTIONS
   1. Section 00300 - Bid
   2. Section 00500 - Agreement
   3. Section 01020 - Allowances
   4. Section 01026 - Schedule of Values

1.02 UNIT QUANTITIES SPECIFIED

A. Quantities and measurements indicated in SECTION 00300 are for bidding and contract purposes only. Quantities and measurements supplied or placed in the Work and verified by the Engineer shall determine payment.

B. If the actual Work requires more or fewer quantities than those quantities indicated, provide the required quantities at the unit price contracted.

1.03 MEASUREMENTS OF QUANTITIES

A. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.

B. Measurement by Area: Measured by square dimension using mean length and width or radius.

C. Linear Measurement: Measured by linear dimension, along the horizontal projection of the centerline or mean chord.

D. At appropriate points in this text, specifications are given with respect to measuring or estimating certain quantities and the sums due for the same. Except as otherwise provided, the Engineer shall determine the appropriate method for measuring and computing each quantity, and for estimating the sums due for the various kinds of work and material, using such methods, tools and degrees of precision as are suitable for the particular measurement, Item or computation. When so requested by the Engineer, assistance in measuring or determining quantities, shall be provided by furnishing the help of unskilled laborers on the site, by furnishing copies of invoices, or by other means.

E. For estimating quantities in which the computations of areas by analytic and geometric methods would be laborious, as determined by the Engineer, it is stipulated and agreed that the planimeter shall be considered an instrument of precision adapted to the measurement of such areas and may be used for this purpose.
1.04 UNIT PRICES

A. Payment will be computed on the basis of the unit price bid in SECTION 00300 for each Item and the quantity of units completed. Unit prices are to include cost of all necessary materials, labor, equipment, overhead, profit and other applicable costs. (See Par. 1.06, this Section.)

B. The Owner reserves the right to increase or decrease the scope of the Contract work by twenty-five percent (25%) of the original scope.

1.05 LUMP SUM PRICES

A. Payment will be computed on the basis of the percentage of work completed on each Item in the contract BID as determined by the Engineer. Lump sum prices are to include the cost of all necessary materials, labor, equipment, overhead, profit and other applicable costs. (See Par. 1.06, this Section.)

B. The Contractor's breakdown (submit under SECTION 01026) of the lump sum bid will be used only as a guide to determine the percentage of completion.

1.06 PRICES INCLUDE

A. The prices stated in the Proposal include full compensation not only for furnishing all the labor, equipment and material needed for, and for performing the work and building the structures contemplated by, the Contract, but also for assuming all risks of any kind for expenses arising by reason of the nature of the soil, ground water, or the action of the elements; for all excavation and backfilling; for the removal of and delay or damage occasioned by trees, stumps, tracks, pipes, ducts, timber, masonry or other obstacles; for removing, protecting, repairing, or restoring, without cost to the Owner, all pipes, ducts, drains, sewers, culverts, conduits, curbs, gutters, walks, fences, tracks, or other obstacles, road pavements and other ground surfacing whether shown on plans or not for draining, damming, pumping or otherwise handling and removing, without damage to the work or to other parties, and without needless nuisance, all water or sewage from whatever source which might affect the work or its progress, or be encountered in excavations made for the work; for furnishing, inserting and removing all sheeting, shoring staging, cofferdams, etc.; for all signs, fencing, lighting, watching, guarding, temporary surfacing, bridging, snow removal, etc., necessary to maintain and protect travel on streets, walks and private ways; furnishing, installing and removing haybales and silt fences, and erosion controls for catch basins, as direct; for making all provisions necessary to maintain and protect buildings, fences, poles, trees, structures, pipes, ducts and other public or private property affected or endangered by the work; for the repair or replacement of such things if injured by neglect of such provisions for removing all surplus or rejected materials as may be directed; for replacing, repairing and maintaining the surfaces of streets, highways, public and private lands if and where disturbed by work performed under the Contract or by negligence in the performance of work under the Contract; for furnishing the requisite filling materials in case of any deficiency or lack of suitable materials; for obtaining all permits and licenses and complying with the requirements thereof, including the cost of furnishing any security needed in connection therewith; for any and all expense on account of the use of any patented device or process; for protection against inclement or cold weather; for all expenses incurred by or on account of the suspension; interruption or discontinuance of work; for the cost of the surety bond and adequate insurance; for all taxes, fees, union dues, etc., for which the Contractor may be or become liable, arising out of his operations incidental to the Contract; for providing equipment on the site and off site; for providing a field office and its appurtenances and for all general and
incidental expenses; for tools, implements and equipment required to build and put into good working order all work contemplated by the Contract; for maintaining and guaranteeing the same as provided; and for fulfilling all obligations assumed by the Contractor under the Contract and its related documents.

B. The Owner shall pay and the Contractor shall receive the prices stipulated in the BID made a part hereof as full compensation for everything performed and for all risks and obligations undertaken by the Contractor under and as required by the Contract.

C. The prices for those Items which involve excavation shall include compensation for disposal of surplus excavated material and handling water.

D. In all Items involving excavation, the price shall be based on doing the entire excavation in earth. Where rock is excavated, the price, therefore, shall be in addition to the cost of excavating earth and no deduction will be made in the amount for earth excavation.

E. The prices for all pipe Items (i.e. sewers, service connections, drains, etc.) shall constitute full compensation for furnishing, laying, jointing and testing; earth excavation, backfill and compaction; materials for bedding pipe as specified; and cleaning up.

1.07 PAYMENT

A. In general, payment will be made for all Contract work satisfactorily completed through the end of the previous month. The payment will include any additional work which has been completed and approved and change order work agreed upon by the Owner and Contractor which has been completed and approved (See SECTION 00500).

B. Each application for payment will indicate the total of a minimum percent retainage as defined in SECTION 00500, held by the Owner on the total of all work completed under the contract and approved for payment to-date.

C. Monthly applications for payment may also indicate reduction or increase of the total Contract price when an approved change order results in a net reduction or net increase in the cost and quantity of work to be performed under the Contract.

D. Special billings and charges against the Contract as credit or payment to the Owner, that are not for change order work, may be subtracted from monies due on any monthly application for payment but shall not serve to reduce the total Contract price.

E. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the Engineer multiplied by the unit price for work which is incorporated in or made necessary by the Work.

1.08 METHOD OF MEASUREMENT AND BASIS OF PAYMENT

BID ITEM NOS. 1a through 1c  FURNISH AND INSTALL WATER MAIN

1. The length of water main to be paid for shall be measured by the linear foot along the horizontal projection of the centerline of the water main, the lengths of valves or fittings not being deducted.
2. The unit prices shall constitute full compensation for furnishing and installing the water main with sizes and classes specified including **all required fittings**, saw cutting existing pavement, removal and disposal of excavated bituminous concrete, excavation and backfill, sheeting and bracing, dewatering and drainage, disposal of excess material, laying and jointing pipe, furnishing and installing gravel borrow, connections to the existing water mains, removal and disposal of existing pipe, and fittings, loaming and seeding of disturbed areas, dust control measures, disinfection, accepted pressure testing and sampling performed by qualified companies and laboratories, as indicated on the Drawings and as specified, including restrained joints and thrust blocks for pipe as required and directed by the Engineer, and all work incidental thereto, and all work not specifically included for payment under other items.

3. The unit price shall constitute full compensation for excavation of all depths required for installation to accommodate existing utilities or structures.

4. The unit prices shall constitute full compensation for furnishing and installing insulation around catch-basins and culverts, as required and directed by the Engineer.

5. The unit price for this item shall constitute full compensation for removal and resetting of existing structures, all types of sidewalk reconstruction and resetting of any curb (bituminous concrete or granite).

6. The unit price shall constitute full compensation for Polyethylene Encasement in trenches requiring Type A Flowable Concrete Fill.

7. The unit price shall include a reasonable amount of delays encountered for shut-downs of existing water mains required to prosecute the work.

8. Payment of unaccepted pipe (i.e., not meeting pressure and bacteria requirements) beyond 2,000 feet will be made at 35% of the unit bid price until such pipe is accepted.

**BID ITEM NOS. 2a through 2c  FURNISH AND INSTALL VALVES**

1. The unit price shall be equal to the actual number of valves installed. The unit price shall constitute full compensation for furnishing and installing valves including all restraint devices required and as directed by the Engineer required to complete the work, valve boxes and all work not specifically included for payment under other items.

2. The unit price for this item shall constitute full compensation for removing and disposing existing gate valves and valve boxes removed during installation.

**BID ITEM NO. 2d  REMOVE EXISTING GATE VALVE BOXES**

1. The unit price for this item shall constitute full compensation for each existing gate valve box removed and disposed on an existing water main that is to be abandoned,
including saw cutting, any pavement repair as required and as directed by the Engineer, required to complete the Work, and any work not specifically included for payment under other items.

2. Compensation for removing existing gate valves boxes on top of an existing water main that is also to be removed and replaced shall be included with payment under Items 1a through 1d.

BID ITEM NOS. 3a through 3c FURNISH AND INSTALL INSERTION VALVES

1. The unit price shall be equal to the actual number of valves installed. The unit price shall constitute full compensation for furnishing and installing valves including all restraint devices required and as directed by the Engineer required to complete the work, valve boxes and all work not specifically included for payment under other items.

2. Confirm location of insertion valve installation with Engineer prior to beginning any work or ordering insertion valve materials

BID ITEM NOS. 4a through 4c FURNISH AND INSTALL LINE STOPS

1. The unit price shall be equal to the actual number of lines stops installed. The unit price shall constitute full compensation for furnishing and installing line stops including all restraint devices required and as directed by the Engineer required to complete the work and all work not specifically included for payment under other items.

2. Confirm location of line stop installation with Engineer prior to beginning any work or ordering line stop materials

BID ITEM NO. 5a FURNISH AND INSTALL HYDRANT ASSEMBLY

1. The unit price for this item shall constitute full compensation for furnishing and installing new hydrants, complete and as specified and detailed, including all materials shown in the drawings and details; mainline connection pipe and couplings, anchor tees of all sizes, 6-inch connection pipe, gate valve, fittings, bends, adapters, valve boxes, thrust block, excavating, bedding, backfilling, compacting, gravel fill, loaming and seeding, pavement or sidewalk reconstruction, replacing any curbing disturbed, and painting to City’s color scheme. **Concrete sidewalk shall be repaired with bituminous concrete.**

BID ITEM NO. 5b REMOVE EXISTING HYDRANT

1. The unit price shall constitute full compensation for the cost of removing and disposing of hydrants complete as specified, and as detailed, including, excavation, removing all hydrant branch piping including hydrant tee, valve and mainline piping, replacing mainline piping and coupling, backfill, pavement or sidewalk reconstruction, resetting of any curb (bituminous concrete or granite), gravel base
course, trench width temporary pavement (where applicable), trench width binder
course, and permanent trench width pavement (where applicable). **Concrete
sidewalk shall be repaired with bituminous concrete.**

**BID ITEM NOS. 6a & 6b REPLACE EXISTING SERVICE CONNECTIONS**

1. The length of service connections to be paid for under this item for all sizes and
classes shall be measured by the linear foot along the horizontal projection of the
centerline of the completed connection, the lengths of valves or fittings shall not be
deducted.

2. The unit price for furnishing and installing copper tubing shall include excavation,
installing service pipe (up to 2-inch diameter) from the corporation stop to the two
feet past the curb stop with fittings, unions, and adapters as necessary and shown on
the drawings, including connection to the existing service, all materials. Excavation,
including saw cutting, removal and disposal of bituminous concrete, dewatering,
bedding, backfill and restoration of property to include loaming, seeding, curbing
(granite or bituminous reset in concrete), all types of sidewalk reconstruction and dust
control measures. **Concrete sidewalk shall be repaired with bituminous concrete.**

**BID ITEM NOS. 7a & 7b FURNISH AND INSTALL CORPORATION STOPS**

1. The unit price for this item shall include furnishing, tapping of the water main, and
installing corporation stops up to 2-inch diameter, complete, as indicated on the
drawings.

**BID ITEM NOS. 7c & 7d FURNISH AND INSTALL CURB STOPS**

1. The unit price for this item shall include excavation, including removal and disposal
of bituminous concrete, bedding, backfill and restoration of property to include
loaming, seeding, and curbing (granite or bituminous reset in concrete).

2. The unit price for curb stops with boxes for sizes up to 2-inch diameter shall
constitute full compensation for furnishing and installing stop and stop boxes
including all restraint devices, if required, and as directed by the Engineer to
complete the work, and all work not specifically included for payment under other
items.

**BID ITEM NOS. 8a & 8b FURNISH AND INSTALL TEMPORARY SERVICE
BYPASS PIPING**

1. The length of the bypass pipe shall be measured by the linear foot along the
horizontal projection of the centerline of the approved bypass pipe.

2. The unit price shall constitute full compensation for furnishing piping, valves, check
valves, labor, equipment and materials to install an approved temporary potable water
bypass system, complete, including connections to existing hydrants for feed and fire
department utilization, connections to individual house water services (no temporary
house service piping will be measured for payment), wye fittings at sill cocks, disinfection and testing, temporary fire protection (hydrants), excavation & backfilling, saw cutting and disposal of pavement, sampling, maintenance and removal, and all work not specifically included for payment under other items.

3. The unit price shall constitute full compensation for any below-grade bypass pipe installation including backfill, gravel base course, trench width temporary pavement (where applicable), trench width binder course, and permanent trench width pavement (where applicable).

4. The unit price shall constitute full compensation for **providing and maintaining rubber or plastic bypass ramps**, which shall be installed at all driveway and right-of-way crossings, as specified and ordered by the Engineer.

5. The unit price shall constitute full compensation for furnishing all piping, services, labor, equipment and materials to install an approved temporary potable water bypass connection to an existing water main, large service or hydrant, complete, including disinfection and testing, furnishing and installing tapping sleeves and any valves, check valves, fittings, couplings, required to be installed and removed or left-in-place, excavation and backfilling and all work not specifically included for payment under other items.

**BID ITEM NO. 9a CONNECTION TO EXISTING FIRE SERVICES**

1. The unit price shall be equal to the actual number of connections to fire services. The unit price for connecting to existing fire service connections shall include full compensation for locating and connecting to existing service. All cost for excavation, installing service pipe (all materials and classes) from the water main, corporation stop, tees, valves, fittings, couplings, restoration of property to include loaming, seeding, curbing (granite or bituminous reset in concrete), all types of sidewalk reconstruction, dust control measures and adapters as necessary and shown on the drawings shall be paid for under the appropriate bid item.

**BID ITEM NO. 9b SPRINKLER SYSTEM FLOW TEST**

1. The unit price to be paid for under this item shall be the number of fire service sprinkler system flow tests conducted.

2. The unit price shall include cost for the Employment of a “Fire Protection Sprinkler System Contractor” as defined in the Commonwealth of Massachusetts Regulations 528 (528 CMR 12.00), designation “SC”, and issued by the Massachusetts Department of Public Safety, for the coordination of the service connection.

**BID ITEM NO. 10a EXCAVATION OF UNSUITABLE MATERIALS BELOW NORMAL GRADE**

1. The quantity of earth excavation of unsuitable materials below normal grade (limit of normal excavation) to be included for payment under the appropriate subdivision of
this item shall be the number of cubic yards of unsuitable material excavated, measured to the depths and lengths ordered, as determined by the Engineer, and to the width between payment limits for normal excavation as indicated on the drawings.

2. The unit price shall constitute full compensation for excavation and replacement of unsuitable material below normal grade and proper disposal of unsuitable material.

3. Gravel borrow backfill below normal grade shall be paid for under this item. The quantity of gravel borrow backfill below normal grade to be paid for shall be the same as the number of cubic yards of excavation of unsuitable materials below normal grade, which said gravel replaces.

4. Gravel borrow used to backfill rock excavations will not be measured for payment under this item but shall be included as part of the unit price for “ROCK EXCAVATION AND DISPOSAL.”

5. The unit price shall constitute full compensation for furnishing, placing, and compacting gravel borrow, as specified.

BID ITEM NO. 10b EXCAVATION OF UNSUITABLE MATERIALS ABOVE NORMAL GRADE

1. The quantity of earth excavation of unsuitable materials above normal grade (limit of normal excavation) to be included for payment under the appropriate subdivision of this item shall be the number of cubic yards of unsuitable material excavated, measured to the depths and lengths ordered, as determined by the Engineer, and to the width between payment limits for normal excavation as indicated on the drawings.

2. The unit price shall constitute full compensation for excavation and replacement of unsuitable material above normal grade and proper disposal of unsuitable material.

3. Gravel borrow ordered by the Engineer for backfill of trenches above normal grade shall be paid for under this item. The quantity of gravel borrow used as backfill for trenches above normal grade to be paid for shall be the same as the number of cubic yards of excavation of unsuitable materials above normal grade, which said gravel replaces.

4. Gravel borrow used to backfill rock excavations will not be measured for payment under this item but shall be included as part of the unit price for “ROCK EXCAVATION AND DISPOSAL.”

5. The unit price shall constitute full compensation for furnishing, placing, and compacting gravel borrow, as specified.

6. Gravel borrow ordered to be used in bituminous concrete sub-base shall be paid for under this item.
7. Gravel borrow ordered to be used at other locations shall be measured after compaction and paid for under this item as the number of cubic yards of gravel actually placed and compacted as directed.

BID ITEM NO. 10c  ROCK EXCAVATION & DISPOSAL

1. When rock is encountered, it shall be uncovered but not excavated until measurements have been made by the Engineer, unless in the opinion of the Engineer, satisfactory measurements can be made in some other manner.

2. The quantity of rock to be paid for under this item shall be the number of cubic yards of rock, measured in place before excavation, within the payment limits as specified and as defined on the Detail sheets, unless rock excavation beyond such limits has been authorized in writing by the Engineer, in which case, measurements shall be made to the authorized limits.

3. Excavated rock which has not been disposed of shall not be included for payment.

4. The bidder shall include in his bid for items involving excavation, the cost of doing the entire excavation in earth, the price for this item being intended to cover the difference between the cost of rock excavation and the cost of earth excavation.

5. The unit price shall constitute full compensation for rock excavation and disposal, for all necessary backfilling, and for furnishing all additional material needed for backfilling.

BID ITEM NO. 11  EARTH EXCAVATION & BACKFILL FOR TEST PITS

1. The quantity of earth excavation and backfill for test pits to be measured for payment shall be the number of cubic yards placed as directed by the Engineer.

2. The unit price shall constitute full compensation for saw cutting, excavation, disposal of bituminous concrete pavement, and backfill for test pits, as ordered by the Engineer.

BID ITEMS NOS. 12a through 12d  PAVEMENT RESTORATION

Basis of Payment for Pavement in General

1. The unit prices for pavement shall constitute full compensation for cleaning the existing pavement including hand and power sweeping, tack coats and tack edging as required, constructing permanent pavement, including all handwork necessary for sidewalks, driveways, curbing, and for construction transitions from new to existing bituminous concrete pavement, as indicated and not specifically included for payment under other items.

2. Payment of unaccepted pavement will be made at 35% of the unit bid price until such pavement is accepted.
BID ITEM NO. 12a  GRAVEL BASE COURSE (16-INCHES)

1. The quantities of gravel-base course shall be measured for payment by the cubic yard of 16-inch gravel base course installed, as specified in the Contract Drawings.

2. The unit price for gravel-base course shall constitute full compensation for furnishing material for gravel-base course as specified and as indicated, when so ordered by the Engineer. Placing and compacting the gravel-base course is incidental to the appropriate items involving backfill. The gravel-base course for trenches for mainline pipe, side-street connections, hydrants, and service connections shall be included for payment under this item.

3. Suitable material, as determined by the Engineer, taken from excavations made as part of the contract work and used for gravel-base course shall not be included for payment under this item.

4. The unit price for gravel-base course shall also include all additional work required for work in roads and streets, such as sawing existing pavement; removal and disposal of existing pavement; special compaction requirements; safety precautions including but not limited to warning signs, barricades and fences; and all other appurtenant work not specifically paid for under other items.

BID ITEM NO. 12b  TRENCH WIDTH BITUMINOUS CONCRETE BINDER COURSE (4-INCHES)

1. The unit price for bituminous concrete binder course pavement shall constitute full compensation for furnishing and installing the pavement as herein specified and shall be measured for pavement by the ton of pavement installed, as specified in the Contract Drawings. Bituminous concrete binder course for hydrant and service connection trench paving will be paid for under this item.

2. The unit price for bituminous concrete binder course shall also include all additional work required for work in roads and streets, such as saw cutting, removal and disposal of existing and temporary pavement, special compaction requirements, sealing of joints, tack coats, safety precautions including but not limited to warning signs, barricades, fences and all other appurtenant work not specifically paid for under other items.

BID ITEM NO. 12c  TRENCH WIDTH BITUMINOUS CONCRETE SURFACE COURSE (2-INCHES)

1. The unit price for bituminous concrete surface course pavement shall constitute full compensation for furnishing and installing the pavement as herein specified and shall be measured for pavement by the ton of pavement installed as determined by the weight slips originating from the bituminous concrete plant and as specified in the Contract Drawings.
2. The unit price for bituminous concrete surface course shall also include all additional work required for work in roads and streets, such as removal and disposal of existing and temporary pavement, saw cutting to maintain clean straight edges, sealing of joints, tack coats, special compaction requirements, safety precautions including but not limited to warning signs, barricades, fences and all other appurtenant work not specifically paid for under other items.

BID ITEM NO. 12d  TRENCH WIDTH TEMPORARY PAVEMENT (2-inch)

1. The unit price for (trench width) temporary pavement shall constitute full compensation for construction of the (trench width) pavement as herein specified and shall be measured per tonnage installed.

2. The unit price for temporary pavement shall also include all additional work required for work in roads and streets, such as removal and disposal of existing pavement, saw cutting existing pavement, special compaction requirements, safety precautions including but not limited to warning signs, barricades, fences and all other appurtenant work not specifically paid for under other items.

3. Pavement thickness shall be a total of 2-inches after compaction. Total tonnage slips must be submitted from the production plant.

BID ITEM NO. 13a  ADDITIONAL CONCRETE (ALL CLASSES)

1. The quantity of concrete to be measured for payment shall be the number of cubic yards placed as directed by the Engineer.

2. No measurement shall be made under this item for concrete used as indicated on the drawings for work which appropriate payment items have been provided or for concrete used to backfill unauthorized excavations.

3. The unit price shall constitute full compensation for furnishing and placing concrete (all classes) as specified.

BID ITEM NO. 13b  FLOWABLE CONCRETE FILL

1. The unit price shall constitute full compensation for removal and disposal of excavated material, and furnishing and placing of Type A flowable concrete fill (as specified in Section 02224) per cubic yard as required and as directed by the Engineer.

BID ITEM NO. 14  ADDITIONAL CRUSHED STONE

1. Crushed stone backfill below normal depth shall be paid for under this item. The quantity of crushed stone backfill below normal depth to be paid for shall be the same as the number of cubic yards of earth excavation below normal depth, measured for payment under the appropriate subdivision of “MISCELLANEOUS EARTH EXCAVATION,” which said gravel replaces.
2. Additional crushed stone used for support of existing utilities or ordered by the Engineer to be used at other locations shall be paid for under this item. The quantity to be paid for shall be the number of cubic yards measured in place after compaction, of additional crushed stone within the limits directed by the Engineer.

3. Crushed stone used for bedding pipe, to backfill unauthorized excavations, for any drainage purpose, or as indicated on the Drawings for work for which appropriate payment items have been provided, shall not be measured for payment under this item.

4. Crushed stone used to backfill rock excavations will not be measured for payment under this item but shall be included as part of the unit price for “ROCK EXCAVATION & DISPOSAL.”

5. The unit price shall constitute full compensation for furnishing, placing, and compacting crushed stone, as specified.

BID ITEM NO. 15  MOBILIZATION

1. The lump sum price for this Item shall constitute full compensation for initiating the contract, exclusive of the cost of materials, for mobilizing all machinery, plant, tools, and other equipment necessary to carry on and complete the work.

2. The lump sum shall also include full compensation for furnishing the performance or surety bond and other securities required, all preliminary bidding and organizational expenses, necessary permits, construction of temporary roads, etc., and for all other materials, supplies, tools, equipment, labor financing, supervision, temporary structures, field offices, sanitary conveniences, and any and all other expenses incurred in carrying out the work and furnishing the material, keeping records and making reports required, and assuming risks, which have not been included in the prices in other Items of the Proposal.

3. The lump sum price for this Item shall not exceed five percent (5%) of the total amount of Items 1a through 14.

BID ITEM NO. 16  CONTAMINATED SOIL AND GROUNDWATER ALLOWANCE

1. The lump sum price to be paid for under this Item shall constitute full compensation as detailed in Section 01020 - Allowances, and not specifically paid for under other Items, as directed by the Engineer.

2. The lump sum price allowance for this Item established in the Bid is an estimated figure to facilitate comparison of bids only. The actual amount to be paid under this Item to the Contractor will be the price negotiated between the Owner and the Contractor.
3. The lump sum price allowance for this Item shall include full compensation for all labor, tools, equipment, materials, and any and all other expenses incurred to excavate, stockpile, load and transport contaminated soil as well as treat and discharge contaminated groundwater in the event contamination is encountered during construction.

4. The lump sum price allowance includes full compensation for laboratory characterization of contaminated soil and groundwater.

5. The lump sum price allowance for this Item shall NOT include any costs associated with Items and/or services for which specific payment Items are provided for under the Bid.

6. If the total cost for such charges is greater or less than the allowance amount stated under this Item of the Bid, a debit or credit of the difference in such cost shall be to the Owner.

BID ITEM NO. 17 ALLOWANCE FOR UNIFORMED TRAFFICMEN

1. Under this Item the Contractor shall be reimbursed for certain charges for the services rendered of uniformed traffic officers to provide traffic control as specified.

2. Invoices shall be paid upon receipt.

3. The lump sum price established in the Bid is an estimated figure to facilitate the comparison of bids. The actual amount to be paid under this Item shall constitute full compensation for wages paid, premiums on workmen’s compensation insurance, payment on account of social security and other direct assessments on payroll, and all other costs incidental to the employment of such uniformed officers.

4. Payment will be based on the actual paid invoiced amount from the Police Department without allowance for mark up, overhead or profit.

5. If the total cost for uniformed traffic control is greater or less than the amount stated in the Bid, a debit or credit of the difference in cost shall be applied to the lump sum price for this Item.

6. Payment shall be made to the Police department no later than the 20th day of the month following that month in which services were rendered.

BID ITEM NO. 18 PRIVATE PROPERTY PLUMBING AND/OR RESIDENTIAL ISSUES ALLOWANCE

1. The lump sum price to be paid for under this Item shall constitute full compensation as detailed in Section 01020 - Allowances, and not specifically paid for under other Items, as directed by the Engineer.
2. The lump sum allowance for this Item includes Contractor coordination with residential plumber to resolve private property plumbing and/or residential issues that arise during the course of performing work under this Contract.

3. The lump sum price allowance for this Item established in the Bid is an estimated figure to facilitate comparison of bids only. The actual amount to be paid under this Item to the Contractor will be the price negotiated between the Owner and the Contractor.

4. The lump sum price allowance for this Item shall NOT include any costs associated with Items and/or services for which specific payment Items are provided for under the Bid.

5. If the total cost for such charges is greater or less than the allowance amount stated under this Item of the Bid, a debit or credit of the difference in such cost shall be to the Owner.

**BID ITEM NO. 19 TOWABLE VARIABLE MESSAGE SIGN BOARDS**

1. The unit price for this item shall include furnishing towable variable message sign boards to the City of Quincy for their permanent use.

2. Payment of the sign boards shall not be made until the sign has been turned over to the City of Quincy DPW.

**PART 2 PRODUCTS**

NOT USED

**PART 3 EXECUTION**

NOT USED

END OF SECTION
SECTION 01035
MODIFICATION PROCEDURES

PART 1  GENERAL

1.01  SUMMARY

A. Section Includes
1. Procedures for making modifications to the Contract by change orders or other means.

B. Related Sections
1. Document 00500 - Agreement

1.02  CHANGE ORDERS

A. In general Change Orders will be issued for modification of Contract documents which will incorporate changes in the Contract requirements, including additions or deletions in the Work; for unforeseen field conditions which will necessitate changes in the Work; changes in code provisions or other requirements of federal, state or local authority requiring changes in the Work; changes in the availability of products or for incorporating new products into the work and for changes directed by the Engineer for the benefit of the Owner.

B. Authority to execute Change Orders shall be that of the Engineer and not of the Contractor. Changes Orders will, in general, originate by a “Change Order Proposal Request” or by issuance of a “Construction Change Authorization”.

C. Unless authorized by the Engineer, no work shall be performed that is involved in the change until a formal Change Order is issued.

D. To initiate a Change Order, the Engineer will forward a Change Order proposal request describing the proposed changes and if required, include additional or revised drawings and specifications soliciting a formal quotation of cost and time to complete the proposed Change Order work. Upon reaching mutual agreement on the cost and time, the Engineer will sign his approval of the Change Order and submit it to the Contractor for his full signature of acceptance.

1.03  FIELD ORDERS

A. The Engineer may, to avoid costly removal of, or alterations to, present on-going work, issue a Work Directive Change authorizing the Contractor to proceed, subject to later negotiation of the price of the change.

1.04  PRICE AGREEMENTS

A. Prices agreed upon to cover the Change Orders may be either by mutual acceptance of a lump sum or by unit prices as stated in the Contract bid proposal or actual direct cost plus a percentage for overhead, profit and other expenses consistent with Section 00500 – Contract Agreement.
B. Work done by a subcontractor entitles the General Contractor a percentage of the sum of the actual direct cost, not including the subcontractor’s overhead and profit, consistent with Section 00500 – Contract Agreement.

C. Method for computing the cost of the change shall be based on the net additional increase. No overhead and profit shall be deducted from prices for changes deleting work.

D. The Change Order form document shall indicate the net adjustment (+/-) to the total Contract price as a result thereof including extension or reduction of time when applicable.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION
SECTION 01040

COORDINATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for coordinating the various parts of Work under this Contract.

1.02 REQUIREMENTS

A. Coordinate scheduling, submittals, and Work of the various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements.

B. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

C. Coordinate space requirements and installation of mechanical, instrumentation and electrical work, which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

E. Coordinate completion and clean up of Work of separate Sections in preparation for Substantial Completion.

F. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

G. Coordinate work with all utility companies necessary for completion of work under this contract.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Building codes, Mechanical codes, and Electrical codes, Regulations, Permits and Fees applicable to the project.

1.02 PERMITS BY CONTRACTOR
   A. The Contractor shall secure all necessary permits from the state, city or town authorities having jurisdiction, for digging of trenches in the streets or highways and all other building and construction operations requiring permits.
   B. As a minimum the following permits are required:
      1. Street Opening Permit - City of Quincy, Dept. of Public Works
      2. Excavation and Trench Safety Permit in accordance with M.G.L. c. 82A, and 520 CMR 14.00. - City of Quincy, Dept. of Public Works.

1.03 PERMITS BY OWNER
   A. The Owner has obtained or will obtain and pay all fees for the permits listed here:
      1. MWRA 8(m) Permit

1.04 FEES
   A. The cost of all permits secured by the Contractor shall be borne by him and shall be considered as having been included in the price or prices stated in the Bid. Copies of all required permits shall be filed with the Engineer prior to starting work for which a permit is required.

PART 2 PRODUCTS
   NOT USED

PART 3 EXECUTION
   NOT USED

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. General Provisions
B. MGL Chapter 30 Section 38A
C. Fuel Price Adjustment, (Both Diesel and Gas)
D. Asphalt Price Adjustment
E. Cement Price Adjustment
F. Structural and Reinforcing Steel Price Adjustment

1.02 GENERAL PROVISIONS

A. The herein specified material price adjustments are required in contracts for road, bridge, water and sewer projects awarded under Chapter 30, Section 39M of the Massachusetts General Laws.

B. Material price adjustments are not required for contracts awarded under Chapter 149, Section 44A of the Massachusetts General Laws.

1.03 MASSACHUSETTS GENERAL LAW CHAPTER 30 SECTION 38A

A. Section 38A. “Contracts for road and bridge projects awarded as a result of a proposal or invitation for bids under section 39M shall include a price adjustment clause for each of the following materials: fuel, both diesel and gasoline; asphalt; concrete; and steel. Contracts for water and sewer projects awarded as a result of a proposal or invitation for bids under said section 39M shall include a price adjustment clause for fuel, both diesel and gasoline; liquid asphalt; and portland cement contained in cast-in-place concrete. A base price for each material shall be set by the awarding authority or agency and shall be included in the bid documents at the time the project is advertised. The awarding authority or agency shall also identify in the bid documents the price index to be used for each material. The price adjustment clause shall provide for a contract adjustment to be made on a monthly basis when the monthly cost change exceeds plus or minus 5 per cent.”

1.04 FUEL PRICE ADJUSTMENT, (BOTH DIESEL AND GAS)

A. This monthly fuel price adjustment is inserted in this contract because the national and worldwide energy situation has made the future cost of fuel unpredictable. This adjustment will provide for either additional compensation to the Contractor or repayment to the Owner, depending on an increase or decrease in the average price of diesel fuel or gasoline.

B. The fuel adjustment for prices increasing or decreasing 5% or more will be based on the actual number of gallons of diesel and/or gasoline fuel utilized for an individual monthly period as verified through the requirements stated herein, and further multiplied by the variance in price from the Base Price to the Period Price.
C. The Base Price of Diesel Fuel and Gasoline will be the price as indicated in the Massachusetts DOT Highway Division’s web site: http://www.massdot.state.ma.us/highway/DoingBusinessWithUs/Construction/PriceAdjustments.aspx for the month in which the contract was bid, which included State Tax.

D. The Period Price will be the average of prices charged to the State, including State Tax for the bulk purchases made during each month.

E. This adjustment will be effected only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

F. No adjustment will be paid for work done beyond the extended completion date of any contract.

G. Any adjustment (increase or decrease) to estimated quantities made to each item at the time of final payment will have the fuel price adjustment figured at the average period price for the entire term of the project for the difference of quantity.

H. The Contractor shall supply to the Owner a list of equipment, on a monthly basis, being utilized on the project that requires diesel and gasoline fuel. The Owner must approve the list prior to any fuel slips being submitted. The Contractor shall supply diesel and gas fuel slips to the Owner, on a monthly basis, for only the equipment specified on the list and approved to have been utilized on the project for that month. The slips must indicate the source (company supplying the fuel), date, project name, whether the fuel is diesel or gasoline, the equipment fueled and the volume of the fuel for that equipment. Only slips with the aforementioned information will be considered in determining fuel adjustment prices.

I. The Diesel Fuel Base Price for this Contract will be $2.267.

J. The Gasoline Fuel Base Price for this Contract will be $1.814.

1.05 ASPHALT PRICE ADJUSTMENT

A. This provision applies to all projects using greater than 100 tons of hot mix asphalt (HMA) mixtures containing liquid asphalt cement as stipulated in this section.

B. The Price Adjustment will be based on the variance in price for the liquid asphalt component only from the Base Price to the Period Price. It shall not include transportation or other charges. This Price Adjustment will occur on a monthly basis.

C. Base Price

1. The Base Price of liquid asphalt on a project as listed herein, is a fixed price determined at the time of bid by the Department (MassHighway), by using the same method as for the determination of the Period Price detailed below.

D. Period Price

1. Please note that, starting July 19, 2013, only one asphalt period price (formerly called the “New Asphalt Period Price”) will be posted each month on the MassHighway website:
E. New Asphalt Period Price Method (Currently called “Period Price”)

1. The “New Asphalt Period Price Method” is for contracts bid after December 15, 2008 and will show the Period Price of liquid asphalt for each monthly period as determined by MassHighway using the average selling price per standard ton of PG64-28 paving grade (primary binder classification) asphalt, FOB manufacturer's terminal, as listed under the "East Coast Market - New England, Boston, Massachusetts area" section of the Poten & Partners, Inc. "Asphalt Weekly Monitor". This average selling price is listed in the issue having a publication date of the second Friday of the month and will be posted as the Period Price for that month. MassHighway will post this Period Price on this website within two (2) business days following their receipt of the relevant issue of the "Asphalt Weekly Monitor". Poten and Partners has granted MassHighway the right to publish this specific asphalt price information sourced from the Asphalt Weekly Monitor.

F. Old Asphalt Period Price Method (Obsolete)

1. The “Old Asphalt Period Price Method” Period Price will be for contracts bid on or before December 15, 2008 and will contain liquid asphalt prices as determined by the old or previous method. These prices will continue to be posted on MassHighway’s website until all contracts using the “Old Asphalt Period Price Method” Period Price have been closed.

G. New and Old Asphalt Period Price Methods

1. The paragraphs below apply to both the New and the Old Asphalt Period Price Methods.

2. The Contract Price of the hot mix asphalt mixture will be paid under the respective item in the Contract. The price adjustment, as herein provided, upwards or downwards, will be made after the work has been performed, using the monthly period price for the month during which the work was performed.

3. The Price Adjustment applies only to the actual virgin liquid asphalt content in the mixture placed on the job in accordance with the Standard Specifications for Highways and Bridges, Division III, Section M3.11.03.

4. The Price Adjustment will be determined by multiplying the number of tons of hot mix asphalt mixtures placed during each monthly period times the liquid asphalt content percentage times the variance in price between Base Price and Period Price of liquid asphalt.

5. This Price Adjustment will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

6. No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is an approved extension of time.

H. The Asphalt Base Price for this Contract will be $527.50.
1.06 CEMENT PRICE ADJUSTMENT

A. This provision applies to all projects using greater than 100 Cubic Yards (76 Cubic Meters) of Portland cement concrete containing Portland cement as stipulated in this section. This Price Adjustment will occur on a monthly basis.

B. The Price Adjustment will be based on the variance in price for the Portland cement component only from the Base Price to the Period Price. It shall not include transportation or other charges.

C. The Base Price of Portland cement on a project is a fixed price determined at the time of bid by the Department by using the same method as for the determination of the Period Price (see below) and found herein.

D. The Period Price of Portland cement will be determined by using the latest published price, in dollars per ton (U.S.), for Portland cement (Type I) quoted for Boston, U.S.A. in the Construction Economics section of ENR Engineering News-Record magazine or at the ENR website http://www.enr.com/ under Construction Economics. The Period Price will be posted on the MassHighway website: http://www.massdot.state.ma.us/highway/DoingBusinessWithUs/Construction/PriceAdjustments.aspx the Wednesday immediately following the publishing of the monthly price in ENR, which is normally the first week of the month.

E. The Contract Price of the Portland cement concrete mix will be paid under the respective item in the Contract. The price adjustment, as herein provided, upwards or downwards, will be made after the work has been performed, using the monthly period price for the month during which the work was performed.

F. The price adjustment applies only to the actual Portland cement content in the mix placed on the job in accordance with the Contract Plans and Specifications. No adjustments will be made for any cement replacement materials such as fly ash or ground granulated blast furnace slag.

G. The Price Adjustment will be determined by multiplying the number of cubic yards of Portland cement concrete placed during each monthly period times the Portland cement content percentage times the variance in price between the Base Price and Period Price of Portland cement.

H. This Price Adjustment will be paid only if the variance from the Base Price is 5% or more for a monthly period. The complete adjustment will be paid in all cases with no deduction of the 5% from either upward or downward adjustments.

I. No Price Adjustment will be allowed beyond the Completion Date of this Contract, unless there is an approved extension of time.

J. The Cement Base Price for this Contract will be $122.89.

1.07 STRUCTURAL AND REINFORCING STEEL PRICE ADJUSTMENT

A. This provision applies to projects containing a price adjustment for structural steel and reinforcing steel as stipulated in this section. It applies to all structural steel as defined below and all reinforcing steel on the project. Compliance with this provision is mandatory, i.e.,
there are no “opt-in” or “opt-out” clauses. Price adjustments will be handled as described below and shall only apply to unfabricated structural steel material, consisting of rolled shapes, plate steel, sheet piling, pipe piles, steel castings and steel forgings, and unfabricated reinforcing steel bars.

B. Structural steel and reinforcing steel price adjustments do not apply to water and sewer projects awarded as a result of a proposal or invitation for bids under MGL Chapter 30 Section 39M.

C. Price adjustments will be variances between Base Prices and Period Prices. Base Prices and Period Prices are defined below.

D. Price adjustments will only be made if the variances between Base Prices and Period Prices are 5% or more. A variance can result in the Period Price being either higher or lower than the Base Price. Once the 5% threshold has been achieved, the adjustment will apply to the full variance between the Base Price and the Period Price.

E. Price adjustments will be calculated by multiplying the number of pounds of unfabricated structural steel material or unfabricated reinforcing steel bars subject to a price adjustment by the index factor calculated as shown below under Example of a Period Price Calculation.

F. Price adjustments will not include the costs of shop drawing preparation, handling, fabrication, coatings, transportation, storage, installation, profit, overhead, fuel costs, fuel surcharges, or other such charges not related to the cost of the unfabricated structural steel and unfabricated reinforcing steel.

G. The weight of steel subject to a price adjustment shall not exceed the final shipping weight of the fabricated part by more than 10%.

H. Base Prices and Period Prices are defined as follows:

1. Base Prices of unfabricated structural steel and unfabricated reinforcing steel on a project are fixed prices determined by the Department (MassHighway) and found herein.

2. The Base Price Date is the month and year in which the Owner opened bids for the project. This date is used to select the Base Price Index.

3. Period Prices of unfabricated structural steel and unfabricated reinforcing steel on a project are variable prices calculated based on the purchase date of the steel (Period Price Date) using an index of steel prices to adjust the Base Price.

4. The Period Price Date is the date the steel was delivered to the fabricator as evidenced by an official bill of lading submitted to the Owner containing a description of the shipped materials, weights of the shipped materials and the date of shipment. This date is used to select the Period Price Index.

5. The index used for the calculation of Period Prices is the U.S. Bureau of Labor Statistics (BLS) Producer Price Index (PPI) Series ID WPU101702 (Not Seasonally Adjusted, Group: Metals and Metal Products, Item: Semi-finished Steel Mill Products.) As this index is subject to revision for a period of up to four (4) months after its original publication, no price adjustments will be made until the index for the period is finalized, i.e., the index is no longer suffixed with a “(P)”.

I. Period Prices are determined as follows:
1. Period Price = Base Price X Index Factor
2. Index Factor = Period Price Index / Base Price Index

J. Example of a Period Price Calculation:

1. Calculate the Period Price for December 2009 using a Base Price from March 2009 of $0.82/Pound for 1,000 Pounds of ASTM A709 (AASHTO M270) Grade A36 Structural Steel Plate.
2. The Period Price Date is December 2009. From the PPI website*, the Period Price Index = 218.0.
3. The Base Price Date is March 2009. From the PPI website*, the Base Price Index = 229.4.
4. Index Factor = Period Price Index / Base Price Index = 218.0 / 229.4 = 0.950
   Period Price = Base Price X Index Factor = $0.82/Pound X 0.950 = $0.78/Pound
5. Since $0.82 - $0.78 = $0.04 is less than 5% of $0.82, no price adjustment is required.
6. If the $0.04 difference shown above was greater than 5% of the Base Price, then the price adjustment would be 1,000 Pounds X $0.04/Pound = $40.00. Since the Period Price of $0.78/Pound is less than the Base Price of $0.82/Pound, indicating a drop in the price of steel between the bid and the delivery of material, a credit of $40.00 would be owed to the Owner. When the Period Price is higher than the Base Price, the price adjustment is owed to the Contractor.
7. * To access the PPI website and obtain a Base Price Index or a Period Price Index, go to http://www.bls.gov/PPI/

K. The Contractor will be paid for unfabricated structural steel and unfabricated reinforcing steel under the contract pay items or allowances for all components constructed of either structural steel or reinforced Portland cement concrete under their respective Contract Pay Items.

L. Price adjustments, as herein provided for, will be paid separately for Structural Steel and Reinforcing Steel.

M. No price adjustment will be made for price changes after the Contract Completion Date, unless the Owner has approved an extension of Contract Time for the Contract.

N. The structural steel base price for this contract will be $N/A.
O. The reinforcing steel base price for this project will be $N/A.
P. The casting base price for this project will be $N/A.

END OF SECTION
SECTION 01067

STATE OF MASSACHUSETTS AND LOCAL REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. EXCERPTS FROM MASSACHUSETTS STATUTES
B. MINIMUM WAGE RATES
C. SAFETY AND HEALTH
D. ATTACHMENTS

1. Massachusetts Minimum Wage Rates.

1.02 EXCERPTS FROM MASSACHUSETTS STATUTES

A. In addition to the requirements as set forth under "Compliance with Laws" in the AGREEMENT, particular attention is directed to certain stipulations of Chapter 149 of the General Laws of Massachusetts, as amended to date as follows:

Section 25. "Every employee in public work shall lodge, board, and trade where and with whom he elects; and no person or his agents or employees under contract with the commonwealth, a county, city or town, or with a department, board, commission or officer acting therefore, for the doing of public work shall directly or indirectly require, as a condition of employment therein, that the employee shall lodge, board or trade at a particular place or with a particular person. This section shall be made a part of the contract for such employment."

Section 26. "In the employment of mechanics and apprentices, teamsters, chauffeurs and laborers in the construction of public works by the commonwealth, or by a county, town or district, or by persons given to citizens of the commonwealth who have been residents of the commonwealth for at least six months at the commencement of their employment who are male veterans as defined in clause forty-three of section seven of chapter four and who are qualified to perform the work to which the employment relates;

and secondly, to citizens of the commonwealth generally who have been residents of the commonwealth for at least six months at the commencement of their employment, and if they cannot be obtained in sufficient numbers then to citizens of the United States, and every contract for such work shall contain a provision to this effect."

Section 34. "Every contract, except for the purchase of, material or supplies, involving the employment of laborers, workmen, mechanics, foremen, or inspectors, to which the commonwealth or any county or any town, subject to section thirty, is a party, shall contain a stipulation that no laborer, workman, mechanic, foreman or inspector working within the commonwealth, in the employ of the contractor, subcontractor or other person doing or contracting to do the whole or a part of the work contemplated by the contract, shall be required or permitted to work more than eight hours in any one day or more than 48 hours in any one week, or more than six days in any one week, except in cases of emergency, or in case
any town subject to section thirty-one is a party to such a contract, more than eight hours in any one day, except as aforesaid."

Section 34A. "Every contract for the construction, alteration, maintenance, repair or demolition of or addition to, any public building or other public works for the commonwealth or any political subdivision thereof shall contain stipulations requiring that the contractor shall, before commencing performance of such contract, provide by insurance for the payment of compensation and the furnishing of other benefits under chapter one hundred and fifty-two to all persons to be employed under the contract, and that the contractor shall continue such insurance in full force and effect during the term of the contract. No officer or agent contracting in behalf of the commonwealth or any political subdivision thereof shall award such a contract until he has been furnished with sufficient proof of compliance with the aforesaid stipulations. Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of contract and shall operate as an immediate termination thereof. No cancellation of such insurance, whether by the insurer or by the insured, shall be valid unless written notice thereof is given by the party proposing cancellation to the other party and to the officer or agent who awarded the contract at least fifteen days prior to the intended effective date thereof, which date shall be expressed in said notice. Notice of cancellation sent by the party proposing receipt of the addressee requested, shall be a sufficient notice..."

Section 34B. "Every contract for the construction, alteration, maintenance, repair or demolition of, or addition to, any public works for the commonwealth or any political subdivision thereof shall contain stipulations requiring that the contractor shall pay to any reserve police officer employed by him in any city or town the prevailing rate of wage paid to regular police officers employed by him in such city or town."

Attention is directed to Chapter 774 of the Acts of 1972 amending Section 39F of Chapter 30 to read as follows:

Section 39F. "(1) Every contract awarded shall contain the following subparagraphs 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 sub-paragraphs (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 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 to 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 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 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 for 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.”

Section 39L. The commonwealth and every county, city, town, district, board, commission or other public body which, as the awarding authority, requests 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 the work with, and shall not approve as a subcontractor furnishing labor and materials for a part of the work, a foreign corporation which has not filed with the awarding authority a certificate of the state secretary stating that the corporation has complied with requirements of section 15.03 of subdivision A of Part 15 of chapter 156D and the date of compliance, and further has filed all annual reports required by section 16.22 of subdivision B of Part 16 of said chapter 156D, 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.

Attention is also directed to Chapter 774 of the Acts of 1972 further amending Chapter 30 by adding after Section 39M the following section:

Section 39M. (b) Specifications for such contracts, and specification 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 therefore, 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 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 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 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."

Attention is also directed to Chapter 1164 of the Acts of 1973 further amending Chapter 30 by adding after Section 39N the following two sections:

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 shall make an adjustment in the contract but shall not include any profit to the general contractor on such increase; and provide 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 data 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 20 days before the general contractor notified the awarding abutting 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, 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 required 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 data by which the decision will be made."

Attention is also directed to Chapter 30, Section 39R of the General Laws of Massachusetts as amended to date as follows:

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 forty-four H, inclusive, of chapter one hundred 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 forty-four H, inclusive, of chapter one hundred 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, memorandum invoices, computer printouts, tapes, discs, papers and other documents 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 delineation 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 she/he 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 a financial condition of the contractor.

(7) "Management", when used herein, means the chief executive officers, 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 30B through 30P, inclusive, of chapter seven, and pursuant to section 39M of chapter 30 or to section 44A through 44H, inclusive, of chapter 149, 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 therefore, and shall accompany said description 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 filed 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 its 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 in 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 she/he 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 during the term of the contract a financial statement prepared by an independent certified public accountant on the basis of an audit by sub 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 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).

1.03 MINIMUM WAGE RATES

A. Minimum Wage Rates as determined by the Commissioner of Department of Labor and Industries under the provision of the Massachusetts General Laws, Chapter 149, Sections 26
to 27D, as amended, apply to this project. It is the responsibility of the contractor, before bid opening, to request if necessary, any additional information of Minimum Wage Rates for those trades-people who may be employed for the proposed work under this contract. Minimum wage rates are included at the end of this section.

1.04 SAFETY AND HEALTH

A. This project is subject to the Safety and Health regulation of the U.S. Department of Labor set forth in 29 CFR Part 1926, Commonwealth of Massachusetts Regulations CMR 454, and to the Massachusetts (Department of Labor and Industries,) Division of (Industrial) Occupational Safety "Construction Industry Rules and Regulations for the Prevention of Accidents in Construction operations (Chapter 454 CMR 10.00 et. seq.)". Contractors shall be familiar with the requirements of these regulations.

END OF SECTION
Awarding Authority: City of Quincy  
Contract Number: QUINCY  
City/Town:  
Description of Work: FY19 Water Main Contract 1 - Work under this Contract includes, but is not limited to, installation of 11,000 linear feet of 8-inch ductile iron water mains, including all appurtenances in Quincy, MA.  
Job Location: Various Streets

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
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For apprentice rates see "Apprentice- LABORER"
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*HEAT & FROST INSULATORS LOCAL 6 (BOSTON)* | 12/01/2018 | $37.90 | $11.50 | $7.10 | $0.00 | $56.50 |
|  | 06/01/2019 | $38.90 | $11.50 | $7.10 | $0.00 | $57.50 |
|  | 12/01/2019 | $39.90 | $11.50 | $7.10 | $0.00 | $58.50 |
|  | 06/01/2020 | $40.90 | $11.50 | $7.10 | $0.00 | $59.50 |
|  | 12/01/2020 | $41.90 | $11.50 | $7.10 | $0.00 | $60.50 |
| ASPHALT RAKER  
*LABORERS - ZONE 1* | 12/01/2018 | $38.90 | $7.85 | $15.35 | $0.00 | $62.10 |
|  | 06/01/2019 | $39.90 | $7.85 | $15.35 | $0.00 | $63.10 |
|  | 12/01/2019 | $40.90 | $7.85 | $15.35 | $0.00 | $64.10 |
|  | 06/01/2020 | $41.89 | $7.85 | $15.35 | $0.00 | $65.09 |
|  | 12/01/2020 | $42.87 | $7.85 | $15.35 | $0.00 | $66.07 |
|  | 06/01/2021 | $43.89 | $7.85 | $15.35 | $0.00 | $67.09 |
|  | 12/01/2021 | $44.90 | $7.85 | $15.35 | $0.00 | $68.10 |

For apprentice rates see "Apprentice- LABORER"

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*OPERATING ENGINEERS LOCAL 4* | 12/01/2018 | $47.58 | $11.50 | $15.60 | $0.00 | $74.68 |
|  | 06/01/2019 | $48.68 | $11.50 | $15.60 | $0.00 | $75.78 |
|  | 12/01/2019 | $49.83 | $11.50 | $15.60 | $0.00 | $76.93 |
|  | 06/01/2020 | $50.93 | $11.50 | $15.60 | $0.00 | $78.03 |
|  | 12/01/2020 | $52.08 | $11.50 | $15.60 | $0.00 | $79.18 |
|  | 06/01/2021 | $53.18 | $11.50 | $15.60 | $0.00 | $80.28 |
|  | 12/01/2021 | $54.33 | $11.50 | $15.60 | $0.00 | $81.43 |

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

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| BACKHOE/FRONTE-END LOADER  
*OPERATING ENGINEERS LOCAL 4* | 12/01/2018 | $47.58 | $11.50 | $15.60 | $0.00 | $74.68 |
|  | 06/01/2019 | $48.68 | $11.50 | $15.60 | $0.00 | $75.78 |
|  | 12/01/2019 | $49.83 | $11.50 | $15.60 | $0.00 | $76.93 |
|  | 06/01/2020 | $50.93 | $11.50 | $15.60 | $0.00 | $78.03 |
|  | 12/01/2020 | $52.08 | $11.50 | $15.60 | $0.00 | $79.18 |
|  | 06/01/2021 | $53.18 | $11.50 | $15.60 | $0.00 | $80.28 |
|  | 12/01/2021 | $54.33 | $11.50 | $15.60 | $0.00 | $81.43 |

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

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| BARCO-TYPE JUMPING TAMPER  
*LABORERS - ZONE 1* | 12/01/2018 | $38.90 | $7.85 | $15.35 | $0.00 | $62.10 |
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|  | 12/01/2020 | $42.87 | $7.85 | $15.35 | $0.00 | $66.07 |
|  | 06/01/2021 | $43.89 | $7.85 | $15.35 | $0.00 | $67.09 |
|  | 12/01/2021 | $44.90 | $7.85 | $15.35 | $0.00 | $68.10 |

For apprentice rates see "Apprentice- LABORER"

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| BLOCK PAVER, RAMMER / CURB SETTER  
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|  | 06/01/2020 | $42.39 | $7.85 | $15.35 | $0.00 | $65.59 |
|  | 12/01/2020 | $43.37 | $7.85 | $15.35 | $0.00 | $66.57 |
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|  | 12/01/2021 | $45.40 | $7.85 | $15.35 | $0.00 | $68.60 |

For apprentice rates see "Apprentice- LABORER"
### Classification

**BOILER MAKER**  
**BOILERMakers LOCAL 29**

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### Notes:

**Apprentice to Journeyworker Ratio: 1:4**

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**BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)**

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**Notes:**

- Apprentice to Journeyworker Ratio: 1:5

**BULLDOZER/GRADER/SCRAPER**

**OPERATING ENGINEERS LOCAL 4**

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For apprentice rates see "Apprentice- OPERATING ENGINEERS"

**CAISSON & UNDERPINNING BOTTOM MAN**

**LABORERS - FOUNDATION AND MARINE**

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For apprentice rates see "Apprentice- LABORER"

**CAISSON & UNDERPINNING LABORER**

**LABORERS - FOUNDATION AND MARINE**

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For apprentice rates see "Apprentice- LABORER"
### Classification

**CAISSON & UNDERPINNING TOP MAN**  
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For apprentice rates see "Apprentice- LABORER"

### Classification

**CARBIDE CORE DRILL OPERATOR**  
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For apprentice rates see "Apprentice- LABORER"

### Classification

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Notes:  
% Indentured After 10/1/17; 45/45/55/55/70/70/80/80  
Step 1&2 $30.22/ 3&4 $36.03/ 5&6 $52.86/ 7&8 $58.73  
Apprentice to Journeyworker Ratio:1:5
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All Aspects of New Wood Frame Work - As of 9/1/09 Carpentry work on wood-frame WEATHERIZATION projects shall be paid the WOOD FRAME CARPENTER rate.

### Apprentice - CARPENTER (Wood Frame) - Zone 2

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### Notes:

- % Indentured After 10/1/17; 45/45/55/55/70/70/80/80
- Step 1&2 $19.26/ 3&4 $26.72/ 5&6 $33.89/ 7&8 $36.60

### Apprentice to Journeyworker Ratio: 1:5

### CEMENT MASONRY/PLASTERING

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

**Apprentice to Journeyworker Ratio: 1:3**

**CHAIN SAW OPERATOR**

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For apprentice rates see "Apprentice- LABORER"

**CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES**

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For apprentice rates see "Apprentice- OPERATING ENGINEERS"
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For apprentice rates see "Apprentice- OPERATING ENGINEERS"

### DELEADER (BRIDGE)
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### Painter - PAINTER Local 35 - BRIDGES/TANKS
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**Effective Date - 07/01/2019**

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Notes:
- Steps are 750 hrs.
- Apprentice to Journeyworker Ratio: 1:1

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**LABORERS - ZONE 1**

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

**Apprentice to Journeyworker Ratio:** 2:3***

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**ELEVATOR CONSTRUCTOR**

**ELEVATOR CONSTRUCTORS LOCAL 4**

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

## Apprentice to Journeyworker Ratio: 1:1

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For apprentice rates see "Apprentice- OPERATING ENGINEERS"
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**Notes:**
- Steps are 750 hrs.
- % After 09/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)
- Step 1&2 $30.55/ 3&4 $36.49/ 5&6 $53.33/ 7&8 $59.33

#### Apprentice to Journeyworker Ratio: 1:1

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For apprentice rates see "Apprentice- OPERATING ENGINEERS"

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For apprentice rates see "Apprentice- OPERATING ENGINEERS"

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For apprentice rates see "Apprentice- OPERATING ENGINEERS"
### Apprentice - GLAZIER - Local 35 Zone 2

**Effective Date:** 01/01/2019

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**Notes:**
- Steps are 750 hrs.
- Apprentice to Journeyworker Ratio: 1:1

### HOISTING ENGINEER/CRANES/GRADALLS

**OPERATING ENGINEERS LOCAL 4**

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#### Notes:

Apprentice to Journeyworker Ratio: 1:6

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**HVAC (DUCTWORK)**

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For apprentice rates see "Apprentice- SHEET METAL WORKER"

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For apprentice rates see "Apprentice- ELECTRICIAN"

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**HVAC (TESTING AND BALANCING - AIR)**

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For apprentice rates see "Apprentice- SHEET METAL WORKER"

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**HVAC (TESTING AND BALANCING -WATER)**

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

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**HVAC MECHANIC**

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For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER PIPEFITTER"
### HYDRAULIC DRILLS

**LABORERS - ZONE 1**

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For apprentice rates see "Apprentice- LABORER"

### INSULATOR (PIPES & TANKS)

**HEAT & FROST INSULATORS LOCAL 6 (BOSTON)**

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

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**Effective Date - 09/01/2019**

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**Notes:**

Steps are 1 year

**Apprentice to Journeyworker Ratio: 1:4**

### IRONWORKER/WELDER

**IRONWORKERS LOCAL 7 (BOSTON AREA)**

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Notes:

** Structural 1:6; Ornamental 1:4

Apprentice to Journeyworker Ratio:**

JACKHAMMER & PAVING BREAKER OPERATOR

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For apprentice rates see "Apprentice- LABORER"

LABORER

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Issue Date: 02/05/2019  Wage Request Number: 20190205-014
### Apprentice - LABORER - Zone 1

**Effective Date** - 12/01/2018

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**Notes:**

Apprentice to Journeyworker Ratio: 1:5

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### LABORER: CARPENTER TENDER

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For apprentice rates see "Apprentice- LABORER"

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### LABORER: CEMENT FINISHER TENDER

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For apprentice rates see "Apprentice- LABORER"

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### LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER

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For apprentice rates see "Apprentice- LABORER"
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For apprentice rates see "Apprentice- LABORER"

| LABORER: MULTI-TRADE TENDER                 | 12/01/2018     | $38.65    | $7.85  | $15.35  | $0.00                     | $61.85     |
| LABORERS - ZONE 1                          | 06/01/2019     | $39.65    | $7.85  | $15.35  | $0.00                     | $62.85     |
|                                             | 12/01/2019     | $40.65    | $7.85  | $15.35  | $0.00                     | $63.85     |
|                                             | 06/01/2020     | $41.64    | $7.85  | $15.35  | $0.00                     | $64.84     |
|                                             | 12/01/2020     | $42.62    | $7.85  | $15.35  | $0.00                     | $65.82     |
|                                             | 06/01/2021     | $43.64    | $7.85  | $15.35  | $0.00                     | $66.84     |
|                                             | 12/01/2021     | $44.65    | $7.85  | $15.35  | $0.00                     | $67.85     |

For apprentice rates see "Apprentice- LABORER"

| LABORER: TREE REMOVER                      | 12/01/2018     | $38.65    | $7.85  | $15.35  | $0.00                     | $61.85     |
| LABORERS - ZONE 1                          | 06/01/2019     | $39.65    | $7.85  | $15.35  | $0.00                     | $62.85     |
|                                             | 12/01/2019     | $40.65    | $7.85  | $15.35  | $0.00                     | $63.85     |
|                                             | 06/01/2020     | $41.64    | $7.85  | $15.35  | $0.00                     | $64.84     |
|                                             | 12/01/2020     | $42.62    | $7.85  | $15.35  | $0.00                     | $65.82     |
|                                             | 06/01/2021     | $43.64    | $7.85  | $15.35  | $0.00                     | $66.84     |
|                                             | 12/01/2021     | $44.65    | $7.85  | $15.35  | $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                        | 12/01/2018     | $38.90    | $7.85  | $15.35  | $0.00                     | $62.10     |
| LABORERS - ZONE 1                          | 06/01/2019     | $39.90    | $7.85  | $15.35  | $0.00                     | $63.10     |
|                                             | 12/01/2019     | $40.90    | $7.85  | $15.35  | $0.00                     | $64.10     |
|                                             | 06/01/2020     | $41.89    | $7.85  | $15.35  | $0.00                     | $65.09     |
|                                             | 12/01/2020     | $42.87    | $7.85  | $15.35  | $0.00                     | $66.07     |
|                                             | 06/01/2021     | $43.89    | $7.85  | $15.35  | $0.00                     | $67.09     |
|                                             | 12/01/2021     | $44.90    | $7.85  | $15.35  | $0.00                     | $68.10     |

For apprentice rates see "Apprentice- LABORER"

| MARBLE & TILE FINISHERS                    | 02/01/2019     | $40.91    | $10.75 | $18.97  | $0.00                     | $70.63     |
| BRICKLAYERS LOCAL 3 - MARBLE & TILE        | 08/01/2019     | $41.99    | $10.75 | $19.11  | $0.00                     | $71.85     |
|                                             | 02/01/2020     | $42.50    | $10.75 | $19.11  | $0.00                     | $72.36     |
|                                             | 08/01/2020     | $43.58    | $10.75 | $19.26  | $0.00                     | $73.59     |
|                                             | 02/01/2021     | $44.09    | $10.75 | $19.26  | $0.00                     | $74.10     |
|                                             | 08/01/2021     | $45.21    | $10.75 | $19.42  | $0.00                     | $75.38     |
|                                             | 02/01/2022     | $45.68    | $10.75 | $19.42  | $0.00                     | $75.85     |

For apprentice rates see "Apprentice- LABORER"
### Apprentice - MARBLE & TILE FINISHER - Local 3 Marble & Tile

**Effective Date:** 02/01/2019

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**Notes:**
- Apprentice to Journeyworker Ratio: 1:3

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### MARBLE MASONS, TILELAYERS & TERRAZZO MECH

**BRICKLAYERS LOCAL 3 - MARBLE & TILE**

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

#### Effective Date - 02/01/2019

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#### Effective Date - 08/01/2019

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**Notes:**

Apprentice to Journeyworker Ratio: 1:5

### MECH. SWEEPER OPERATOR (ON CONST. SITES)

**OPERATING ENGINEERS LOCAL 4**

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For apprentice rates see "Apprentice- OPERATING ENGINEERS"

### MECHANICS MAINTENANCE

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For apprentice rates see "Apprentice- OPERATING ENGINEERS"

### MILLWRIGHT (Zone 1)

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For apprentice rates see "Apprentice- OPERATING ENGINEERS"

### Painter (Bridges/Tanks)

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### Apprentice - Painter Local 35 - Bridges/Tanks

#### Effective Date - 01/01/2019

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**Notes:**

- Steps are 750 hrs.

**Apprentice to Journeyworker Ratio: 1:1**

**Painter (Spray or Sandblast, New)**

*If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*

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

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**Notes:**
- Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:** 1:1

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**Notes:**
Steps are 750 hrs.
Apprentice to Journeyworker Ratio: 1:1

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For Apprentice rates see "Apprentice- LABORER"

**PAINTER / TAPER (BRUSH, NEW)**

* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.

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**Notes:**
- Steps are 750 hrs.
- Apprentice to Journeyworker Ratio: 1:1

PAINTER / TAPER (BRUSH, REPAINT)

PAINTERS LOCAL 35 - ZONE 2
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**Notes:**

Steps are 750 hrs.

**Apprentice to Journeyworker Ratio:** 1:1

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**PANEL & PICKUP TRUCKS DRIVER**

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**PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK)**

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**PILE DRIVER**

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**Issue Date:** 02/05/2019  **Wage Request Number:** 20190205-014  **Page 28 of 42**
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Notes:

Apprentice to Journeyworker Ratio: 1:5

Pipefitter & Steamfitter

Pipefitters Local 537

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**Notes:**

**1:3; 3:15; 1:10 thereafter / Steps are 1 yr.**


**Apprentice to Journeyworker Ratio:**

### PIPELAYER

**LABORERS - ZONE 1**

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For apprentice rates see "Apprentice - LABORER"

### PLUMBERS & GASFITTERS

**PLUMBERS & GASFITTERS LOCAL 12**

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Notes:
** 1:2; 2:6; 3:10; 4:14; 5:19/Steps are 1 yr
Step4 with lic$62.12, Step5 with lic$69.27

Apprentice to Journeyworker Ratio:**

PNEUMATIC CONTROLS (TEMP.)
PIPEFITTERS LOCAL 537

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

PNEUMATIC DRILL/TOOL OPERATOR
LABORERS - ZONE 1

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For apprentice rates see "Apprentice- LABORER"*

POWDERMAN & BLASTER
LABORERS - ZONE 1

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### Classification

**ROLLER/SPREADER/MULCHING MACHINE**  
*OPERATING ENGINEERS LOCAL 4*

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<th>Base Wage</th>
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<th>Total Rate</th>
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*For apprentice rates see "Apprentice- OPERATING ENGINEERS"*

### ROOFER (Inc. Roofer Waterproofing & Roofer Damproofing)  
*ROOFERS LOCAL 33*

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### Apprentice - ROOFER - Local 33

**Effective Date - 02/01/2019**

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*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)"

### ROOFER SLATE / TILE / PRECAST CONCRETE  
*ROOFERS LOCAL 33*

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*For apprentice rates see "Apprentice- ROOFER"*

### SHEETMETAL WORKER  
*SHEETMETAL WORKERS LOCAL 17 - A*

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### SHEET METAL WORKER - Local 17-A

**Effective Date:** 02/01/2018

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**Notes:**
- Steps are 6 mos.

**Apprentice to Journeyworker Ratio:** 1:4

### PAINTERS LOCAL 35 - ZONE 2

**Effective Date:** 06/01/2013

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<th>Pension</th>
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**Notes:**
- Steps are 4 mos.

**Apprentice to Journeyworker Ratio:** 1:1
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| SPECIALIZED EARTH MOVING EQUIP > 35 TONS            | 12/01/2018     | $34.93    | $11.91 | $12.70  | $0.00                     | $59.54     |
|                                                     | 06/01/2019     | $35.93    | $11.91 | $12.70  | $0.00                     | $60.45     |
|                                                     | 08/01/2019     | $35.93    | $12.41 | $13.72  | $0.00                     | $61.04     |
|                                                     | 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                                    | 01/01/2019     | $57.98    | $9.47  | $19.10  | $0.00                     | $86.55     |
|                                                     | 03/01/2019     | $59.48    | $9.47  | $19.10  | $0.00                     | $88.05     |
|                                                     | 10/01/2019     | $60.98    | $9.47  | $19.10  | $0.00                     | $89.55     |
|                                                     | 03/01/2020     | $62.48    | $9.47  | $19.10  | $0.00                     | $91.05     |
|                                                     | 10/01/2020     | $63.98    | $9.47  | $19.10  | $0.00                     | $92.55     |
|                                                     | 03/01/2021     | $65.48    | $9.47  | $19.10  | $0.00                     | $94.05     |

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

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**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
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**Notes:**

Apprentice to Journeyworker Ratio: 1:1

**TERRAZZO FINISHERS**

**BRICKLAYERS LOCAL 3 - MARBLE & TILE**

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**Notes:**

- Apprentice to Journeyworker Ratio: 1:3

For apprentice rates see "Apprentice- LABORER"

### TEST BORING DRILLER LABORERS - FOUNDATION AND MARINE

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For apprentice rates see "Apprentice- LABORER"

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For apprentice rates see "Apprentice- LABORER"

### TEST BORING LABORER LABORERS - FOUNDATION AND MARINE

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For apprentice rates see "Apprentice- OPERATING ENGINEERS"

For apprentice rates see "Apprentice- LABORER"

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For apprentice rates see "Apprentice- LABORER*

Outside Electrical - East

CABLE TECHNICIAN (Power Zone) OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104

For apprentice rates see "Apprentice- LINEMAN"

CABLEMAN (Underground Ducts & Cables) OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104

For apprentice rates see "Apprentice- PLUMBER/Pipefitter" or "PLUMBER/GASFITTER"
### Classification

For apprentice rates see "Apprentice- LINEMAN"

### DRIVER / GROUNDMAN CDL

**OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104**

- **Effective Date:** 09/03/2017
- **Base Wage:** $31.66
- **Health:** $7.75
- **Pension:** $9.44
- **Supplemental Unemployment:** $0.00
- **Total Rate:** $48.85

For apprentice rates see "Apprentice- LINEMAN"

### DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs)

**OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104**

- **Effective Date:** 09/03/2017
- **Base Wage:** $24.88
- **Health:** $7.75
- **Pension:** $1.75
- **Supplemental Unemployment:** $0.00
- **Total Rate:** $34.38

For apprentice rates see "Apprentice- LINEMAN"

### EQUIPMENT OPERATOR (Class A CDL)

**OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104**

- **Effective Date:** 09/03/2017
- **Base Wage:** $38.45
- **Health:** $7.75
- **Pension:** $13.61
- **Supplemental Unemployment:** $0.00
- **Total Rate:** $59.81

For apprentice rates see "Apprentice- LINEMAN"

### EQUIPMENT OPERATOR (Class B CDL)

**OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104**

- **Effective Date:** 09/03/2017
- **Base Wage:** $33.92
- **Health:** $7.75
- **Pension:** $10.21
- **Supplemental Unemployment:** $0.00
- **Total Rate:** $51.88

For apprentice rates see "Apprentice- LINEMAN"

### GROUNDMAN

**OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104**

- **Effective Date:** 09/03/2017
- **Base Wage:** $24.88
- **Health:** $7.75
- **Pension:** $1.75
- **Supplemental Unemployment:** $0.00
- **Total Rate:** $34.38

For apprentice rates see "Apprentice- LINEMAN"

### GROUNDMAN -Inexperienced (<2000 Hrs.)

**OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104**

- **Effective Date:** 09/03/2017
- **Base Wage:** $20.35
- **Health:** $7.75
- **Pension:** $1.61
- **Supplemental Unemployment:** $0.00
- **Total Rate:** $29.71

For apprentice rates see "Apprentice- LINEMAN"

### JOURNEYMAN LINEMAN

**OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104**

- **Effective Date:** 09/03/2017
- **Base Wage:** $45.23
- **Health:** $7.75
- **Pension:** $16.61
- **Supplemental Unemployment:** $0.00
- **Total Rate:** $69.59

### Apprentice - LINEMAN (Outside Electrical) - East Local 104

**Effective Date:** 09/03/2017

<table>
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<th>Step</th>
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**Notes:**

- **Apprentice to Journeyworker Ratio:** 1:2

### TELEDATA CABLE SPICER

**OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104**

- **Effective Date:** 02/04/2019
- **Base Wage:** $30.73
- **Health:** $4.70
- **Pension:** $3.17
- **Supplemental Unemployment:** $0.00
- **Total Rate:** $38.60

### TELEDATA LINEMAN/EQUIPMENT OPERATOR

**OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104**

- **Effective Date:** 02/04/2019
- **Base Wage:** $28.93
- **Health:** $4.70
- **Pension:** $3.14
- **Supplemental Unemployment:** $0.00
- **Total Rate:** $36.77

### TELEDATA WIREMAN/INSTALLER/TECHNICIAN

**OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104**

- **Effective Date:** 02/04/2019
- **Base Wage:** $28.93
- **Health:** $4.70
- **Pension:** $3.14
- **Supplemental Unemployment:** $0.00
- **Total Rate:** $36.77

### TREE TRIMMER

**OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104**

- **Effective Date:** 01/31/2016
- **Base Wage:** $18.93
- **Health:** $3.55
- **Pension:** $0.00
- **Supplemental Unemployment:** $0.00
- **Total Rate:** $22.67

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**

- **Effective Date:** 01/31/2016
- **Base Wage:** $16.32
- **Health:** $3.55
- **Pension:** $0.00
- **Supplemental Unemployment:** $0.00
- **Total Rate:** $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.

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<th>Classification</th>
<th>Effective Date</th>
<th>Base Wage</th>
<th>Health</th>
<th>Pension</th>
<th>Supplemental Unemployment</th>
<th>Total Rate</th>
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Additional Apprentice 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. Apprentice 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, 3:3, 4:4, 5:5, 6:6, 7:7, 8:8, 9:9, 10:10, 11:11, 12:12, 13:13, 14:14, etc.

**** APP to JM; 1:1, 2:2, 3:3, 4:4, 5:5, 6:6, 7:7, 8:8, 9:9, 10:10, 11:11, 12:12, 13:13, 14:14, 15:15, 16:16, etc.
SECTION 01090
REFERENCE STANDARDS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Reference material, abbreviations, and terms used in the Construction Documents and establishes edition dates and complete titles for standards referenced elsewhere in the Specifications.

1.02 QUALITY ASSURANCE
A. For products or workmanship specified by association, trade or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
B. Obtain copies of standards when required by Contract Documents.
C. Maintain copy at jobsite during submittals, planning, and progress of the specific work, until Substantial Completion.
D. Should specified reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
E. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.03 SCHEDULE OF REFERENCES

<table>
<thead>
<tr>
<th>A</th>
<th>Aluminum Association</th>
<th>1400 Crystal Dr. Suite 430</th>
<th>Arlington, VA 22202</th>
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<tr>
<td>AASHTO</td>
<td>American Association of State Highway and Transportation Officials</td>
<td>444 North Capitol Street, N.W.</td>
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<tr>
<td>ACI</td>
<td>American Concrete Institute</td>
<td>38800 Country Club Dr.</td>
<td>Farmington Hills, MI 48331-3439</td>
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<tr>
<td>AFBMA</td>
<td>Anti-Friction Bearing Manufacturers Association</td>
<td>2025 M. Street, NW</td>
<td>Washington, DC 20036-3309</td>
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<tr>
<td>AGC</td>
<td>Associated General Contractors of America</td>
<td>2300 Wilson Blvd.</td>
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<td>Organization Name</td>
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<td>---------</td>
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</tr>
</tbody>
</table>
| AGM     | American Gear Manufacturers Association  
1001 N. Fairfax Street  
Alexandria, VA 22314-1587 |
| AI      | Asphalt Institute  
2696 Research Park Drive  
Lexington, KY 40511-8480 |
| AISC    | American Institute of Steel Construction  
One East Wacker Drive  
Chicago, IL 60601-1802 |
| AISI    | American Iron and Steel Institute  
25 Massachusetts Drive  
Washington, DC 20001 |
| AMCA    | Air Movement and Control Association  
30 West University Drive  
Arlington Heights, IL 60004 |
| ANS     | American National Standard |
| ANSI    | American National Standards Institute  
1899 L Street, NW, 11th Floor  
Washington, DC 20036 |
| API     | American Petroleum Institute  
1220 L Street, NW  
Washington, DC 20005 |
| ARI     | Air-Conditioning and Refrigeration Institute  
2111 Wilson Boulevard  
Arlington, VA 22201 |
| ASCE    | American Society of Civil Engineers  
1801 Alexander Bell Drive  
Reston, VA 20191 |
| ASHRAE  | American Society of Heating, Refrigerating and  
Air Conditioning Engineers  
1791 Tullie Circle, N.E.  
Atlanta, GA 30329 |
| ASME    | American Society of Mechanical Engineers  
Two Park Avenue  
New York, NY 10016-5990 |
| ASPA    | American Sod Producers Association  
1855 A Hicks Road  
Rolling Meadows, IL 60008 |
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| ASTM    | American Society for Testing and Materials  
|         | 100 Bar Harbor Drive  
|         | PO Box C700  
|         | West Conshohocken, PA 19428-2959 |
| AWG     | American or Brown and Sharpe Wire Gage |
| AWPA    | American Wood-Preservers' Association  
|         | 100 Chase Park South  
|         | Birmingham, AL 35244-1851 |
| AWS     | American Welding Society |
| AWWA    | American Water Works Association  
|         | 6666 West Quincy Avenue  
|         | Denver, CO 80235 |
| BIA     | Brick Institute of America  
|         | 1850 Centennial Park Drive  
|         | Reston, VA 20191 |
| CS      | Commercial Standard |
| EJCDC   | Engineers’ Joint Contract Document Committee  
|         | American Consulting Engineers Council  
|         | 1015 15th Street, N.W.  
|         | Washington, DC 20005 |
| FM      | Factory Mutual System  
|         | 1151 Boston-Providence Turnpike  
|         | PO Box 688  
|         | Norwood, Massachusetts 02062 |
|         | General Services Administration  
|         | Specification and Consumer Information Distribution Section (WFSIS)  
|         | Washington Navy Yard, Bldg. 197  
|         | Washington, DC 20407 |
| HMA     | Hot Mix Asphalt |
| IBR     | Institute of Boiler and Radiator Manufacturers |
| ICBO    | International Conference of Building Officials  
|         | 900 Montclair Road  
|         | Birmingham, AL 35213-2298 |
| IPS     | Iron Pipe Size |
| JIC     | Joint Industry Conference Standards |
MIL  Military Specification
    Naval Publications and Forms Center
    5801 Tabor Avenue
    Philadelphia, PA 19120

NASSCO  National Association of Sewer Service Companies
    2470 Longstone Lane
    Marriottsville, MD 21104

NBS  National Bureau of Standards

NCMA  National Concrete Masonry Association
    13750 Sunrise Valley Drive
    Herndon, VA 20171

NCPWB  National Certified Pipe Welding Bureau

NEMA  National Electrical Manufacturers’ Association
    1300 North 17th Street
    Arlington, VA 22209

NFPA  National Fire Protection Association
    Battery March Park
    Quincy, MA 02269

NPT  National Pipe Thread

OS&Y  Outside screw and yoke

PCA  Portland Cement Association
    5420 Old Orchard Road
    Skokie, IL 60077

SMACNA  Sheet Metal and Air Conditioning Contractors’ National Assoc.
    4201 Lafayette Center Drive
    Chantilly, VA 20151-1219

Stl. WG  U.S. Steel Wire Washburn and Moen, American Steel and Wire
    or Roebling Gage

UL  Underwriters’ Laboratories, Inc.
    333 Pfingston Road
    Northbrook, IL 60062

USS Gage  United States Standard Gage

125-lb. ANS  American National Standard for Cast-Iron Pipe Flanges and Flange
   Fittings, Designation B16.1-1975, for the appropriate class

250-lb. ANS  American National Standard for Cast-Iron Pipe Flanges and Flange
   Fittings, Designation B16.1-1975, for the appropriate class
1.04 EDITION DATES

A. Reference to publications and reference material shall be understood to mean the latest edition, unless stated otherwise.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION NOT USED

END OF SECTION
 PART 1 GENERAL

1.01 SECTION INCLUDES

A. Administrative and procedural requirements for project meetings.

1.02 PRECONSTRUCTION CONFERENCE

A. The Engineer will schedule and administer a pre-construction conference.

B. The pre-construction conference will be scheduled and administered within fourteen (14) calendar days after the dated "Notice to Proceed". The Contractor shall be prepared to address such topics as projected construction schedules, major personnel, critical work areas, construction facilities and shop drawing submittals.

1.03 PROGRESS MEETINGS

A. The Engineer will schedule and administer progress meetings and specially called meetings throughout the duration of the Work at minimum monthly intervals.

B. The time and location of such meetings shall be designated by the Engineer and shall be convenient for all parties involved.

C. The Engineer will prepare agenda with copies for participants, preside at meetings, record minutes, and distribute copies to participants, and those affected by decisions made.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION
PART 1    GENERAL

1.01    SECTION INCLUDES

A. Requirements for submission of schedules and shop drawings.

1.02    PROGRESS SCHEDULE

A. Within fourteen (14) calendar days after execution of the Contract Documents, the Contractor shall submit to the Engineer for review a construction progress schedule conforming to requirements specified. This schedule should show the proposed dates of commencement and completion of each of the various subdivisions of work required under this Contract and the anticipated monthly percentage of completion based on the total contract price. The Contractor shall be responsible for updating and/or revising this schedule whenever directed by the Engineer throughout the duration of the Contract.

B. Special attention is directed to the requirement that the Contractor shall start the Work, as specified under this Contract, no later than thirty (30) calendar days after the execution of the Contract Documents, unless otherwise directed by the Owner. The Contractor shall comply with all pre-construction requirements as specified. The Owner reserves the right to delay the commencement of the Work or any part thereof if the specified requirements as determined by the Engineer have not been satisfied. The Owner further reserves the right to limit or, delay construction, or certain activities thereof, in certain areas of the Contract should the Owner deem it to be in the public's best interest and/or safety to do so.

C. The Contractor shall contact the appropriate town or city authorities concerning any public or semi-public events that may occur during the construction period that may affect construction. The Contractor alone shall be responsible for arranging his construction sequence to conform to any restrictions these events may impose. No claims for extras will be allowed because of any delay, extra materials handling, extra excavation, etc. caused by the imposed restrictions. However, additional time may be granted for completion of the work to compensate for delays caused by said restrictions.

1.03    ELECTRONIC SUBMITTAL PROCEDURES

A. Summary:

1. Shop drawing and product data submittals shall be transmitted to Engineer in electronic (PDF) format via email.

2. The intent of electronic submittals is to expedite the construction process by reducing paperwork, improving information flow, and decreasing turnaround time.

3. The electronic submittal process is not intended for color samples, color charts, or physical material samples.
B. Procedures:

1. Create submittal log by inserting required submittals listed in individual specification sections.

2. Submittal Preparation - Contractor may use any or all of the following options:
   a. Subcontractors and Suppliers provide electronic (PDF) submittals to Contractor via email.
   b. Subcontractors and Suppliers provide paper submittals to Scanning Service which electronically scans and converts to PDF format.

3. Contractor shall review and apply electronic stamp certifying that the submittal complies with the requirements of the Contract Documents including verification of manufacturer / product, dimensions and coordination of information with other parts of the work.

4. Contractor shall transmit each submittal to Engineer via email.

5. Engineer review comments will be made available via email to the Contractor.

6. Distribution of reviewed submittals to subcontractors and suppliers is the responsibility of the Contractor.

1.04 SHOP DRAWINGS

A. Once approved through the Electronic Submittal Procedure, Contractor to submit one (1) full-sized copy of all approved shop and working drawings of concrete reinforcement, structural details, piping layout, wiring, materials fabricated especially for the Contract, and materials and equipment for which such drawings are specifically requested.

B. A maximum of two (2) submittals of each shop drawing will be reviewed by the Engineer. If more submittals are required due to the Contractor’s neglect or failure to fulfill the requirements of the Contract plans and specifications, or to make corrections or modifications required by the Engineer in the review of the first two submittals, the Engineer will review the submittal and the Contractor will be responsible for the cost of the review, as determined by the Owner based on the Engineer’s documentation of time and rates for additional services established in the Engineering Agreement between the Owner and the Engineer.

C. Such drawings shall show the principal dimensions, weight, structural and operating features, space required, clearances, type and/or brand of finish or shop coat, grease fittings, etc., depending on the subject of the drawing. When the dimensions are of particular importance, or when specified, the drawings shall be certified by the manufacturer or fabricator as correct for the Contract.
D. When so specified or if considered by the Engineer to be acceptable, manufacturer's specifications, catalog data, descriptive matter, illustrations, etc., may be submitted in place of shop and working drawings.

E. The Contractor shall be responsible for the prompt and timely submittal of all shop and working drawings to eliminate delay to the Work due to the absence of such drawings. All shop and working drawings must be submitted to the Engineer within thirty (30) calendar days prior to incorporation into the Work, unless otherwise permitted by the Engineer. **Prior to the submittal of any shop drawings, the Contractor shall submit a schedule of proposed shop drawing transmittals.** The schedule shall identify the subject matter of each transmittal, the corresponding specification section number and the proposed date of submission. Prior to and during the progress of the Work the schedule shall be revised and resubmitted as requested by the Engineer.

F. No material or equipment shall be purchased or fabricated for the Contract until the required shop and working drawings have been submitted as hereinabove provided and reviewed for conformance to the Contract requirements. All such materials and equipment and the work involved in their installation or incorporation into the Work shall then be as shown in and represented by said drawings.

G. Until the necessary review has been made, the Contractor shall not proceed with any portion of the Work (such as the construction of foundations) for which review is required.

H. All shop and working drawings shall be submitted to the Engineer by and/or through the Contractor, who shall be responsible for obtaining shop and working drawings from his subcontractors and returning reviewed drawings to them. All shop and working drawings shall be prepared on standard size, 24 inch by 36 inch sheets, except those which are made by changing existing standard shop and working drawings. All drawings shall be clearly marked with the names of the Owner, Contractor, and building, equipment, or structure to which the drawing applies, and shall be suitable numbered. Submitted shop drawings shall be accompanied by a multi-part letter of transmittal provided by the Engineer, and completed by the Contractor as directed by the Engineer.

I. Only drawings which have been checked and corrected by the fabricator should be submitted to the Contractor by his subcontractors and vendors. Prior to submitting drawings to the Engineer, the Contractor shall check thoroughly all such drawings to satisfy himself that the subject matter thereof conforms to the Drawings and Specifications in all respects. All drawings which are correct shall be marked with the date, checker's name, and indication of the Contractor's approval, and then shall be submitted to the Engineer; other drawings shall be returned for correction.

J. If a shop drawing shows any deviation from the Contract requirements, the Contractor shall make specific mention of the deviations in his letter of transmittal.
K. The review of shop and working drawings by the Engineer will be general only, and nothing contained in this Section shall relieve, diminish or alter in any respect the responsibilities of the Contractor under the Contract Documents and in particular, the specific responsibility of the Contractor for details of design and dimensions necessary for proper fitting and construction of the work as required by the Contract and for achieving the result and performance as specified.

L. Should the Contractor submit equipment that requires modifications to the structures, piping, electrical conduit, wires, appurtenances, or layouts etc., either existing or as detailed on the Drawings, he shall also submit details of the proposed modifications. If such equipment and modifications are accepted, the Contractor, at no additional cost to the Owner, shall do the work necessary to make such modifications.

M. The Contractor shall furnish additional copies of shop drawings or catalog cuts when so requested.

PART 2 EXECUTION

2.01 SUBMITTAL SCHEDULE

A. Provide an initial submittal schedule at the pre-construction meeting for review by Owner and Engineer. Incorporate comments from Owner and Engineer into a revised submittal schedule.

B. Maintain the submittal schedule and provide sufficient copies for review by Owner and Engineer. An up-to-date submittal schedule shall be provided at each project progress meeting.

2.02 PROCEDURES

A. ACTION SUBMITTALS

1. CONTRACTOR’S RESPONSIBILITIES

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). Coordinate with other submittals, testing, purchasing, fabrication, delivery and similar sequenced activities. Extensions to the Contract Time will not be approved for the Contractor’s failure to transmit submittals sufficiently in advance of the Work.

b. The submittals of all shop drawings (including working drawings and product data) shall be sufficiently in advance of construction requirement to
allow for possible need of re-submittals, including the specified review time for the Engineer.

c. No less than 30 calendar days will be required for Engineer’s review time for shop drawings and O&M manuals involving only one engineering discipline. No less than 45 calendar days will be required for Engineer’s review time for shop drawings and O&M manuals that require review by more than one engineering discipline. Resubmittals will be subject to the same review time.

d. Submittals of operation and maintenance data shall be provided within 30 days of approval of the related shop drawing(s).

e. Before submission to the Engineer, review shop drawings as follows:

   1) Make corrections and add field measurements, as required

   2) Use any color for its notations except red (reserved for the Engineer’s notations) and black (to be able to distinguish notations on black and white documents)

   3) Identify and describe each deviation or variation from Contract Documents

   4) Include the required Contractor’s Certification statement

   5) Provide field measurements (as needed)

   6) Coordinate with other submittals

   7) Indicate relationships to other features of the Work

   8) Highlight information applicable to the Work and/or delete information not application to the Work

f. If Contractor considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, provide written notice thereof to the Engineer immediately; and do not release for manufacture before such notice has been received by the Engineer.

g. When the shop drawings have been completed to the satisfaction of the Engineer, carry out the construction in accordance therewith; and make no further changes therein except upon written instruction from the Engineer.

2. ENGINEER’S RESPONSIBILITIES
a. Engineer will not review shop drawings (including working drawings and product data) that do not include the Contractor’s approval stamp. Such submittals will be returned to the Contractor, without action, for correction.

b. Partial shop drawings (including working drawings and product data) will not be reviewed. If, in the opinion of the Engineer, a submittal is incomplete, that submittal will be returned to the Contractor for completion. Such submittals may be returned with comments from Engineer indicating the deficiencies requiring correction.

c. If shop drawings (including working drawings and product data) meet the submittal requirements, Engineer will forward copies to appropriate reviewer(s). Otherwise, noncompliant submittals will be returned to the Contractor without action – with the Engineer retaining one copy.

d. Submittals which are transmitted in accordance with the specified requirements will be reviewed by the Engineer within the time specified herein. The time for review will commence upon receipt of submittal by Engineer.

3. REVIEW OF SHOP DRAWINGS (INCLUDING WORKING DRAWINGS AND PRODUCT DATA) AND SAMPLES

a. The review of shop drawings, working 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 (including working drawings and product data) or samples as submitted describe variations and indicate a deviation from the Contract requirements that, in the opinion of the Engineer are in the interest of the Owner and are 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. Only the Engineer will utilize the color “RED” in marking submittals.

e. Shop drawings will be returned to the Contractor with one of the following codes:
1. “Approved”
2. “Approved as Noted” - Minor changes are required, but resubmission is not required.
3. “Revise and Resubmit” - Changes and resubmission are required
4. “Rejected” – 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.
5. “Record File Only” – No action is to be taken (Engineer files submittal)

END OF SECTION
SECTION 01380

CONSTRUCTION PHOTOGRAPHS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for providing photographs for existing conditions and the Work proposed under this Contract.

1.02 REQUIREMENTS

A. The Contractor shall employ at his own expense a fully competent and qualified commercial photographer demonstrating at least three (3) years professional experience in the field of commercial photography. The purpose of this employment shall be to take preconstruction and construction photographs at locations and times designated by the Engineer.

1.03 SUBMITTALS

A. Submit to the Engineer all requested qualifications, experience records, and examples of the photographer's work, for review. Only after the review of the photographer’s qualifications and approval thereof by the Engineer shall the Contractor finalize such employment.

1.04 SCHEDULING

A. Prior to commencement of any work or at any time during the construction, directed by the Engineer, the Contractor and photographer shall consult with the Engineer for instructions concerning views required at each specific work site. The photographs shall show the existing conditions prior to and during construction as require by the Engineer and shall be taken from locations or views designated by the Engineer to adequately illustrate the state of the project and/or conditions of construction. The Contractor shall also arrange with the photographer adequate photographic coverage throughout the duration of this Contract, at the times requested by the Engineer, having said photographer on 24-hour call when services are required.

PART 2 PRODUCTS

2.01 PHOTOGRAPHS

A. The Owner shall be allowed a minimum of four photographed views and shall furnish to the Engineer two prints of each view designated. All photographs shall be a factual presentation of the views designated and shall be taken using correct exposure and focusing techniques insuring high resolution and sharpness, maximum depth-of-field, and minimum distortion. All photograph negatives shall remain the property of the photographer. All prints shall be color, 8 inch by 10 inch size, smooth surface with glossy finish, and paper weight being single. Identification of each print is required giving the following information:

1. Name of Project.
2. Description of view.
3. Time and date of exposure.
4. Climatic conditions (temperature and weather conditions).
5. Name and address of photographer.

B. The Contractor shall insure delivery of all prints on a monthly basis, or as otherwise requested, to the Owner through the Engineer. These deliveries must be made prior to the payment of monthly progress estimates. The Contractor shall pay all costs associated with employing said photographer and furnishing all construction photographs, tapes, and prints, complete as specified, including all incidentals necessary at no additional expense to the Owner.

C. The photographer hereby agrees to properly file and maintain all photograph negatives associated with this Contract for a period of two (2) years from the date of final completion of the project as shown on the final estimate. The photographer must also agree to furnish promptly upon request, additional prints during this specified time period, to the Owner and his Engineer at the commercial rates applicable at the time of the request.

PART 3 EXECUTION

NOT USED

END OF SECTION
SECTION 01381

AUDIO VIDEO RECORDING

PART 1    GENERAL

1.01 SECTION INCLUDES

A. Requirements for color audio video recording of all existing roadway and right-of-way conditions.

1.02 REQUIREMENTS

A. Pre Construction recording

1. Furnish to the Engineer an original and one copy of a continuous color audio video recording. Take recording prior to any construction activity.

2. Recordings to be of sufficient detail to accurately and clearly show the existing, preconstruction conditions of this entire area of the Work. Each recording to include an audio description of the area being video recorded.

3. Coverage shall include, but not limited to, all existing roadways, sidewalks, curbings, driveways, buildings, structures, above ground utilities, landscaping, trees, signage and other physical features located within the zone of influence of the Work. The coverage may be expanded if directed by Engineer.

4. All recordings will be done during daylight hours. No recording shall be performed if weather is not acceptable, such as rain, fog, etc.

B. The Engineer reserves the right to reject any recordings because of poor quality.

C. Any recordings rejected by the Engineer shall be rerecorded at no additional cost.

1.03 SUBMITTALS

A. Provide references of similar projects for review by the Engineer, include owner contacts and telephone numbers.

1.04 QUALITY CONTROL

A. The recording shall be performed by a qualified, established audio video recording firm knowledgeable in construction practices and inspection procedures.

PART 2    PRODUCTS

2.01 AUDIO VIDEO MEDIA

A. Recording media shall be Digital Video Disk (DVD), single layer (4.7 GB capacity), DVD+R or DVD-R format. Contractor to ensure that recording is capable of playback on both commercial DVD players and computer DVD-ROM drives.
PART 3 EXECUTION

3.01 AUDIO AND VIDEO RECORDING

A. Each recording shall begin with the Owner's name, Contract name and number, Contractor's name, date and location information such as street name, direction of travel, viewing side, etc.

B. Information appearing on the recording must be continuous and run simultaneously by computer generated transparent digital information. No editing or overlaying of information at a later date will be acceptable.

C. Digital information will be as follows:
   1. Day, date and time

D. Time must be accurate to within 1/10 of a second and continuously generated.

E. Written documentation must coincide with the information on the recording so as to make easy retrieval of locations sought for a later date.

F. The video system shall have the capability to transfer individual frames of video electronically into hard copy prints or photographic negatives or digital image files in commonly accepted image file formats (e.g. .jpg, .tif, .etc.).

G. Audio shall be recorded at the same time as the video recording. Special commentary will be given for unusual conditions of buildings, sidewalks and curbing, foundations, trees and shrubbery, etc.

H. All DVD's shall bare labels with the following information:
   1. DVD Number
   2. Owner's Name
   3. Date of Recording
   4. Project Name and Number
   5. Location and Standing Limit of recording

END OF SECTION
PART 1  GENERAL

1.01  SECTION INCLUDES

A. Requirements for Contractor’s quality control of products, suppliers, manufacturers, services, site conditions, and workmanship, to produce Work of specified quality.

1.02  QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Comply fully with manufacturers’ instructions, including each step in sequence.

B. Should manufacturers’ instructions conflict with Contract Documents, request clarification from Engineer before proceeding.

C. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

D. Perform work by persons qualified to produce workmanship of specified quality.

E. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.03  FIELD SAMPLES

A. Install field samples at the site as required by individual specifications sections for review.

B. Acceptable samples represent a quality level for the Work.

C. Where field sample is specified to be removed, clear area only after field sample has been accepted by the Engineer.

PART 2  PRODUCTS

NOT USED

PART 3  EXECUTION

NOT USED

END OF SECTION
PART 1 GENERAL

1.01 SUMMARY

A. Section Includes
   1. Qualification, duties and responsibilities of testing laboratories.
   2. Coordination and scheduling responsibilities of the Contractor.

B. Related Sections
   1. Section 01600 - Materials and Equipment

1.02 PAYMENT PROCEDURES

A. Initial Testing
   1. The Contractor will pay for initial testing services required by the Engineer, unless noted otherwise.

B. Retesting
   1. When initial tests indicate noncompliance with the Contract Documents, subsequent retesting occasioned by the noncompliance shall be performed by the same testing agency, and costs thereof will be paid for by the Contractor.

C. Contractors Convenience Testing
   1. Inspecting and testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM)
   1. E329, Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection

1.04 REQUIREMENTS

A. Work included:
   1. Cooperate with the Owner's selected testing agency and all others responsible or testing and inspecting the Work.
   2. Provide other testing and inspecting as specified to be furnished by the Contractor in this Section and/or elsewhere in the Contract Documents.
   3. Where no testing requirements are described, but the Owner directs testing, the Contractor shall provide testing under the requirements of this Specification.

B. Work not included:
   1. Selection of testing laboratory: The Owner will select a qualified independent testing laboratory.
1.05 QUALITY ASSURANCE

A. Qualifications
1. The testing laboratory will be qualified to the Owner's approval in accordance with ASTM E329.

B. Regulatory requirements
1. Testing, when required, will be in accordance with all pertinent codes and regulations and with selected standards of the American Society for Testing and Materials.
2. Regulatory Requirements Inspections and tests required by codes or ordinances, or by a plan approved authority, and which are made by a legally constituted authority, shall be the responsibility of and shall be paid for by the Contractor, unless otherwise provided in the Contract Documents.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Comply with pertinent provisions of Section 01600 - Materials and Equipment.

B. Promptly process and distribute, to the Engineer, required copies of test reports and instructions to assure necessary retesting and replacement of materials with the least possible delay in progress of the Work.

1.07 SCHEDULING

A. Establishing schedule
1. By advance discussion with the testing laboratory selected by the Owner, determine the time required for the laboratory to perform its tests and to issue each of its findings.
2. Provide all required time within the construction schedule.
3. Coordinate testing activity with the appropriate testing laboratory.

B. Revising schedule
1. When changes of construction schedule are necessary during construction, coordinate all such changes with the testing laboratory as required.

C. Adherence to schedule
1. When the testing laboratory is ready to test according to the established schedule, but is prevented from testing or taking specimens due to incompleteness of the Work, all extra charges for testing attributable to the delay may be back-charged to the Contractor and shall not be borne by the Owner.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. Site Tests
1. Representatives of the testing laboratory shall have access to the Work at all times and at all locations where the Work is in progress. Provide facilities for such access to enable the laboratory to perform its functions properly.

2. All specimens and samples for testing, unless otherwise provided in the Contract Documents, shall be taken by the testing personnel. All sampling equipment and personnel will be provided by the testing laboratory. All deliveries of specimens and samples to the testing laboratory will be performed by the testing laboratory.

END OF SECTION
SECTION 01560
TEMPORARY CONTROLS

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Requirements for cleaning, maintenance of the site, barriers and fences required during construction.

1.02  CLEANING DURING CONSTRUCTION

A. Unless otherwise specified under the various trade Sections of the Specifications, the General Contractor shall perform clean-up operations during construction as herein specified.

1. Control accumulation of waste materials and rubbish; periodically dispose of off-site. Bear all costs, including fees resulting from disposal.
2. Clean interior areas prior to start finish work and maintain areas free of dust and other contaminants during finishing operations.
3. Maintain project in accordance with all local, State and Federal Regulatory Requirements.
4. Store volatile wastes in covered metal containers, and remove from premises.
5. Prevent accumulation of wastes that create hazardous conditions.
6. Provide adequate ventilation during use of volatile or noxious substances

B. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

1. Do not burn or bury rubbish and waste materials on site.
2. Do not dispose or volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
3. Do not dispose of wastes into streams or waterways.
4. Use only those materials which will not create hazards to health or property and which will not damage surfaces.
5. Use only those cleaning materials and methods recommended by manufacturer of surface material to be cleaned.
6. Execute cleaning to ensure that the buildings, the sites, and adjacent properties are maintained free from accumulations of waste materials and rubbish and wind blown debris, resulting from construction operations.
7. Provide on-site containers for collection of waste materials, debris, and rubbish.
8. Remove waste materials, debris, and rubbish from the site periodically and dispose of at legal disposal areas off the construction site.
9. Handle material in a controlled manner with as little handling as possible. Do not drop or throw materials from heights.
10. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not damage surrounding surfaces.
11. During its progress, the work and the adjacent areas affected thereby shall be kept cleaned up and all rubbish, surplus materials, and unneeded construction equipment shall be removed and all damage repaired so that the public and property owners will be inconvenienced as little as possible.
12. Where material or debris has washed or flowed into or been placed in existing watercourses, ditches, gutters, drains, pipes, structures, work done under this contract, or
elsewhere during the course of the Contractor’s operations, such material or debris shall be entirely removed and satisfactorily disposed of during the progress of the work, and the ditches, channels, drains, pipes, structures, and work, etc. shall, upon completion of the work, be left in a clean and neat condition.

1.03 DUST CONTROL

A. Provide adequate means for the purpose of preventing dust caused by construction operations throughout the period of the construction contract.

B. This provision does not supersede any specific requirements for methods of construction or applicable general conditions or performance obligations of the General Contractor.

1.04 EROSION AND SEDIMENT CONTROL

A. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

B. Minimize amount of bare soil exposed at one time.

C. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.

D. Construct fill and waste areas by selective placement to avoid erosive surface silts for clays.

E. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

F. Construct sediment control devices for discharge from dewatering trenches.

G. Construct all sedimentation control devices shown on the plans.

1.05 NOISE CONTROL

A. Develop and maintain a noise-abatement program and enforce strict discipline over all personnel to keep noise to a minimum.

B. Execute construction work by methods and by use of equipment which will reduce excess noise.

1. Equip air compressors with Silencers, and power equipment with mufflers.

2. Manage vehicular traffic and scheduling to reduce noise.

1.06 POLLUTION CONTROL

A. Special care shall be taken to prevent contamination or muddying up or interfering in any way with the stream flows, if any along the line of work. No waste matter of any kind will be allowed to discharge into the stream flows or impounded water of any pools or other bodies of water.
1.07 SURFACE WATER CONTROL

A. Take all precautions to prevent damage to the work or equipment by high waters or by storms. The Engineer with the approval of the Owner may prohibit the carrying out of any work at any time when in his judgment, high water or storm conditions are unfavorable or not suitable, or at any time, regardless of the weather, when proper precautions are not being taken to safeguard previously constructed work or work in progress.

B. In case of damage caused by the failure of the Contractor to take adequate precautions, the Contractor shall repair or replace equipment damaged and shall make such repairs or rebuild such parts of the damaged work, as the Engineer may require, at no additional expense to the Owner.

1.08 BARRIERS AND ENCLOSURES

A. Fences and Barricades
   1. Provide and maintain temporary fences, barriers, lights, guardrails, and barricades as indicated in the Contract Documents, or as necessary to secure the Work and adjacent property, and protect persons and property.
   2. Obtain necessary approvals and permits and provide temporary expedients as necessary to accommodate tasks requiring items mentioned herein.

B. Protection of Trees
   1. The Contractor shall take care not to harm trees along the sides of roads or within the existing facility in which the construction work is to be done or trees on adjacent lands except as indicated on the drawings or with the written permission of the Owner and any other owner of the trees involved. Care shall be taken not to cut tree roots so as to harm the growth of trees to remain.
   2. If, in the opinion of the Engineer, any trees damaged during construction can be repaired, the Contractor shall satisfactorily repair same at no further cost to the Owner.
   3. If, in the opinion of the Engineer, any tree damaged during construction cannot be repaired and should be removed, the Contractor shall satisfactorily remove and replace, in kind, same at no further cost to the Owner.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION
SECTION 01570
TRAFFIC REGULATIONS
(MASSACHUSETTS)

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Requirements for traffic control for the duration of the Contract.

1.02  REFERENCES


1.03  PERFORMANCE REQUIREMENTS

A. Contractor shall have the sole responsibility for the maintenance and protection of traffic.

B. An authorized representative of the Contractor shall be available on a 24-hour basis for the duration of the Contract for the purpose of correcting construction related impediments or hazards.

1.04  SHOP DRAWINGS

A. In accordance with SECTION 01300 – SUBMITTALS, submit a traffic plan delineating requirements of this section, the Contract Drawings, and the City of Quincy requirements.

B. Traffic control plans shall detail all typical work zones and detours.

1.05  SITE CONDITIONS

A. Replace at no cost to the Owner pavement markings, legends and lane arrows removed or damaged by the construction operation.

B. Restore temporary detours to original condition.

C. Replace traffic signal loops damaged during construction with in 72 hours.

1.06  SCHEDULING

A. There shall be no time limitations on construction operations except those hours and locations where noise regulations may apply and except as required for the maintenance of traffic as required by the City of Quincy.

B. Keep closing of travel lanes to a minimum.

C. Notify city departments 48 hours prior to construction operations on travel ways.
1. Police Department (617-479-1212).
2. Fire Department (617-376-1011).

PART 2 PRODUCTS

2.01 TRAFFIC CONTROL DEVICES
   A. In accordance with the MUTCD.

PART 3 EXECUTION

3.01 INSTALLATION OF TRAFFIC CONTROL DEVICES
   A. In accordance with the MUTCD.

3.02 PROTECTION OF TRAFFIC
   A. Barricade trenches and roadway excavations at the end of each work period with temporary precast concrete barriers, properly lighted and marked to guide traffic to designated travel lane. Or other means acceptable to the Engineer and approved on the Traffic Plan.
   B. Maintain and protect traffic movements for the entire length of the project.
   C. Keep one lane of traffic open at all times except for brief stoppages dictated by the construction operation involving safety of vehicles in the travel lanes.
   D. Maintain access to business and private ways during construction operations.
   E. Furnish sufficient number of signs, temporary precast concrete barriers, warning lights, drums and traffic cones to warn traffic of construction and guide traffic through the construction area in accordance with the MUTCD.

3.03 TRAFFICMEN
   A. Provide service of uniformed trafficmen as required to complete construction as required by the Owner.

END OF SECTION
SECTION 01580
PROJECT SIGNS

PART 1  GENERAL

1.01  SUMMARY
   A. Section Includes
      1. Requirements for fabricating and erecting Project signs.
   B. Related Sections
      1. Section 01067 –Commonwealth of Massachusetts and Federal Requirements

1.02  SEQUENCING
   A. Signage to be in place 72 hours prior to construction activity in project area.

PART 2  PRODUCTS

2.01  FABRICATION
   A. Project Sign
      1. Purchase and post no street parking signs in all project areas. No parking signs shall at a minimum include date and time of day no parking is allowed.

PART 3  EXECUTION

3.01  SUBMITTAL
   A. Submit signage in accordance with Section 1300 – Submittal.

3.02  ERECTION
   A. Erect in accordance with the details in the Specifications.

3.03  INSTALLATION
   A. Install at the location designated by the Owner.

END OF SECTION
PART 1   GENERAL

1.01   SUMMARY

A. Section Includes
   1. Requirements for delivery, storage, handling and installation of systems, materials, manufactured units, equipment, components, and accessories used in the work.

B. Related Sections
   1. Section 01300 - Submittals

1.02   DELIVERY

A. Refer to Specifications' Sections for requirements pertaining to delivery and handling of materials and equipment.

B. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturers' unopened containers or packaging, dry.

C. Provide equipment and personnel to handle products by methods to prevent soiling or damage.

D. Promptly inspect shipments to assure that products comply with requirements, that quantities are correct, and products are undamaged.

1.03   STORAGE AND PROTECTION

A. The City of Quincy will not provide staging areas for the Contractor’s use. The Contractor is solely responsible for obtaining any required staging areas for their use.

B. Refer to Specifications' Sections for requirements pertaining to storage and protection of materials and equipment.

C. Store products in accordance with manufacturers' instruction, with seals and labels intact and legible. Store sensitive products in weather tight enclosures; maintain within temperature and humidity ranges required by manufacturers' instructions.

D. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.

E. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.

F. Arrange storage to provide access for inspection. Periodically inspect to assure that products are undamaged, and are maintained under required conditions.
1.04 INSTALLATION STANDARDS

A. Comply with Specifications and referenced standards as minimum requirements.

B. Components required to be supplied in quantity within a Specification Section shall be the same, and shall be interchangeable.

C. Do not use materials and equipment removed from existing structures, except as specifically required, or allowed, by the Contract Documents.

D. Perform work by persons qualified to produce workmanship of specified quality.

E. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

F. When work is specified to comply with manufacturers' instructions, submit copies as specified in Section 01300 - Submittals, distribute copies to persons involved, and maintain one set in field office.

G. Perform work in accordance with details of instructions and specified requirements.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION
SECTION 01700

CONTRACT CLOSE-OUT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for specific administrative procedures, record keeping, close-out submittals, and forms used at substantial and final completion of the Work.

B. Contractor shall satisfy all administrative requirements within the Contract Documents and the Requirements listed in this section prior to Contract Close-out.

1.02 FINAL CLEANING

A. On or before the completion of the work, the Contractor shall, unless otherwise especially directed or permitted in writing, tear down and remove all temporary buildings and structures built by him; shall remove all temporary works, tools, and machinery or other construction equipment furnished by him; shall remove all rubbish from any grounds which he has occupied; and shall leave the roads and all parts of the premises and adjacent property affected by his operations in a neat and satisfactory condition.

B. The Contractor shall restore or replace, when and as directed, any public or private property damage by his work, equipment, or employees, to a condition at least equal to that existing immediately prior to the beginning of operations. To this end, the Contractor shall do as required, all necessary highway or driveway, walk and landscaping work. Suitable materials, equipment, and methods shall be used for such restoration. The restoration of existing property or structures shall be done as promptly as practicable as work progresses and shall not be left until the end of the contract period.

C. Unless otherwise specified under the various Sections of the Specifications, the Contract or shall perform final cleaning operations as herein specified prior to final inspection.

D. At completion of work, remove waste materials, rubbish tools, equipment, machinery and surplus materials, and clean all sight-exposed surfaces; leave project clean and ready for occupancy.

E. Cleaning shall include all surfaces, interior and exterior in which the Contractor and all Subcontractors have had access whether existing or new.

F. Refer to Sections of the Specifications for cleaning of specific products or work.

G. Use only those materials which will not create hazards to health or property and which will not damage surfaces.

H. Use only those cleaning materials and methods that are recommended by the manufacturer of surfaces material to be cleaned.

I. Employ experienced workmen, or professional cleaners, for final cleaning operations.
1.03 PROJECT RECORD DOCUMENTS

A. Project Record Documents also referred here as Record Drawings shall consist of all the contract drawings.

B. The Contractor and all Subcontractors shall be required to maintain one set of Record Drawings, as the work relates to their Sections of the Specifications, at the site.

C. Record Drawings shall be stored and maintained in the General Contractor's field office apart from other documents used for construction. The Record Drawings shall be maintained in a clean, dry, and legible condition and shall not be used for construction purposes.

D. Record Drawings shall be available at all time for inspection by the Engineer. All deficiencies noted shall be promptly corrected.

E. The following information shall be indicated on the Record Drawings for building construction:
   1. Record all changes, including change orders, in the location, size, number, and type both horizontally and vertically of all elements of the projects which deviate from those indicated on all the contract drawings.
   2. The tolerance for the actual location of utilities and appurtenances within the building to be marked on the Record Drawings shall be plus or minus two (2) inches.
   3. The location of all underground utilities and appurtenances referenced to permanent surface improvements, both horizontally and vertically at ten (10) ft. intervals and at all changes of direction.
   4. The location of all internal utilities and appurtenances, concealed by finish materials, including but not limited to valves, coils, dampers, vents, clean outs, strainers, pipes, junction boxes, turning vanes, variable and constant volume boxes, ducts, traps and maintenance devices. The location of these internal utilities, appurtenances and devices shall be shown by offsets to the column grid lines on the drawings.
   5. Each of the utilities and appurtenances shall be referenced by showing a tag number, area served and function on the Record Drawings.
   6. Prior to the installation of all finish materials, a review of the Record Drawings shall be made to confirm that all changes have been recorded. All costs to investigate such conditions shall be borne by the applicable party as demonstrated by the Engineer.

F. The following information shall be indicated on the Record Drawings for sewer construction:
   1. Location of manholes with 3 swing ties.
   2. Linear distance of sewer from manhole to manhole, including size and type of pipe.
   3. Manhole rim elevation and invert elevations of all pipes within manholes, including drops.
   4. Recalculated pipe slopes based on record elevations.
   5. Location in feet from downstream manhole of wyes and chimneys and vertical height of chimneys.
   7. Location of service connection terminus (at property line) with 3 swing ties and depth from existing surface grade.
   8. Pumping station information as detailed in 1.03, E.

G. The following information shall be indicated on the Record Drawings for water main construction:
1. Linear distance along watermain from appurtenance (i.e. vault to tee, tee to bends, bends to valves, blow offs and service corporations, including size and type of pipe.
2. Depths of pipe and fittings.
3. Location of vaults, valves, hydrants, bends, blow offs and service curb boxes with 3 swing ties.
4. Rim elevation on vaults (meter, air release etc.).

H. The following information shall be indicated on the Record Drawings for storm drain construction:

1. Rim elevations on inlets, catch basins, manholes and other structures.
2. Invert elevations of all pipes within inlets, catch basins, manholes, end sections, headwalls, culverts and other structures.
3. Linear distance along drain from structure to structure, and branch connections, including size and type of pipe.
4. Recalculated pipe slopes based on record elevations.
5. Location of manholes, inlets, catch basins, outlets, headwalls, other structures and service line connections with 3 swing ties.

I. At the end of each month and before payment for materials installed, the Contractor, and his Subcontractors, shall review Record Drawings for purpose of payment. If the changes in location of all installed elements are not shown on the Record Drawings and verified in the field, then the material shall not be considered as installed and payment will be withheld.

J. At the completion of the contract, each Subcontractor shall submit to the Contractor a complete set of his respective Record Drawings indicating all changes. After checking the above drawings, the Contractor shall certify in writing on the title sheet of the drawings that they are complete and correct and shall submit the Record Drawings to the Engineer.

1.04 EQUIPMENT AND SYSTEM CHECKOUT, CERTIFICATIONS AND TESTING

A. Comply with requirements of Section 01680 Equipment and System Checkout, Certifications and Testing.

1.05 OPERATING AND MAINTENANCE MANUALS

A. Comply with requirements of Section 01730 Operation and Maintenance Manuals.

1.06 SPARE PARTS

A. Comply with requirements of Section 01750 Spare Parts.

1.07 LUBRICANTS

A. Comply with requirements of Section 01751 Lubricants.

1.08 WARRANTIES

A. Comply with requirements of Section 01740 Warranties.
1.09 FINAL INSPECTION

A. The Contractor shall submit written certification that:
   1. Project has been inspected for compliance with Contract Documents.
   2. Equipment and systems have been tested in the presence of the manufacturer’s representative and are operational and satisfactory.
   3. Project is completed, and ready for final inspection.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION
SECTION 01740

WARRANTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers standard warranties on products and special warranties.

1.02 SUBMITTAL

A. Submit written warranties to the Owner prior to the date fixed by the Engineer for Substantial Completion. If the Certificate of Substantial Completion designates a commencement date for warranties other than a date of Substantial Completion for the Work, or a designed portion of the Work, submit written warranties upon request of the Owner.

B. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Owner prior to acceptance of this portion of the Work.

C. Refer to individual Sections of Division 2 through 16 for specific content requirements, and particular requirements for submittal of special warranties.

1.03 WARRANTY REQUIREMENT

A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether the Owner has benefited from use of the Work through a portion of its anticipated useful service life.

D. Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

E. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the contract Documents.
F. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.04 DEFINITIONS

A. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.

B. Special Warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

END OF SECTION
PART 1    GENERAL

1.01 SECTION INCLUDES

A. Procedures for maintaining work completed under this Contract.

1.02 MAINTENANCE PERIOD

A. The general maintenance period for all construction or materials under this Contract shall be one (1) year subsequent to the date of the acceptance of the work by the Owner, or as provided by other sections of this Specification.

B. If the Owner puts any structure or equipment to use prior to acceptance of all work under the Contract, the maintenance period for such structures or equipment shall be calculated from the time use begins.

C. Contractor agrees to replace the material which does not conform to the Contract requirements, and to repair any damage of material or work without cost to the Owner, to satisfaction of Engineer, in conformance with Contract Documents provided orders for replacement and/or repairs are received in writing by the Contractor within the one year period.

D. This Section shall in no way limit the duration of the Contractor’s responsibility for the correction of any defect due to workmanship or materials provided by the Contractor which are not in compliance with the Contract Documents.

1.03 ABUSE OF WORK

A. Contractor is not obligated to perform work of replacement or repair that he may prove is required because of abuse by parties other than the Contractor, after the date the Owner puts to continuous use the work requiring replacements or repair, or after date the Owner has approved the Certificate of Completion.

1.04 EMERGENCY REPAIRS

A. If the Owner deems necessary, the Owner shall order replacement or repairs be undertaken within 6 hours.

B. If the Contractor delays or fails to make the ordered replacement or repairs within the time specified, the Owner shall have the right to make such replacements or repairs and the expense shall be deducted from moneys due the Contractor, or moneys of the Contractor retained by the Owner.

PART 2    PRODUCTS

NOT USED
PART 3  EXECUTION

NOT USED

END OF SECTION
SECTION 02080

MANAGEMENT OF SUSPECT SOIL AND DISPOSAL OF CONTAMINATED SOIL AND WATER

PART 1  GENERAL

1.01  WORK INCLUDED

A. Provide removal and disposal of contaminated soil and water generated during normal requirements for excavation including associated handling, stockpiling and transportation in accordance with this Section and applicable reference standards listed in Article 1.02.

B. Remove, treat and/or dispose of contaminated water generated during dewatering including associated handling, containment, transportation, and disposal/discharge of contaminated water in conformance with Laws, Regulations, and applicable discharge permits.

1.02  REFERENCES

A. Reference Standards

1. Massachusetts Department of Environmental Protection (MassDEP)
   a. 310 CMR 30.000 Hazardous Waste Regulations
   b. 310 CMR 40.0000 Massachusetts Contingency Plan
2. Environmental Protection Agency (EPA)
   a. Remediation General Permit
3. Occupational Safety and Health Administration (OSHA)
   a. OSHA 29 CFR 1910.120, Hazardous Waste Operations and
4. City of Quincy
   b. Stormwater Management Regulations

B. Definitions

1. Emergency discharge is a result of remediation or dewatering activities conducted in response to a public emergency which requires immediate authorization to avoid imminent endangerment to human health, public safety, or the environment, or to reestablish essential public services.

2. On-Site material: suitable material from on-Site excavation.
1.03 SUBMITTALS

A. Submittals shall be made in compliance with the requirements of Section 01300 except as provided for herein.

B. Provide qualifications for Licensed Site Professional (LSP) to Owner and Engineer for review and approval.

C. Provide the appropriate federal or state environmental reports signed by LSP documenting the plan, status, and completion/close-out of work to remove treat and/or dispose of contaminated soil, material, and water generated during excavation and dewatering activities including associated handling, containment, stockpiling/live-loading, transportation, disposal of contaminated soil/material, and disposal/discharge of contaminated water.

D. Provide all environmental permits necessary to conduct excavation activities in contaminated areas.

E. Provide Contractor’s Health and Safety Plan, OSHA HAZWOPER (29 CFR 1910.120) original 40-hour certificate, the most recent 8-hour annual HAZWOPER refresher certificate, and medical monitoring letter indicating staff are fit for duty.

F. Provide Contractor’s certificate of completion for Construction Safety Training (OSHA 29 CFR 1926).

G. Provide electronic copies for all soil, material, and water laboratory reports. Laboratory reports shall appropriately characterize waste for disposal facility acceptance criteria and for compliance with applicable Laws and Regulations.

H. Where disposal or discharge of water is required to support excavation activities, provide electronic copies of all water laboratory reports and discharge monitoring reports. Reports shall appropriately characterize the water for disposal facility acceptance criteria and for discharge in compliance with applicable Laws and Regulations.

I. Provide electronic copies of all executed waste profiles, facility acceptance, transport and/or disposal documentation including bills of lading (BOLs), disposal facility receipts, hazardous waste manifests, or other documents necessary to manage contaminated soil, material, and water.

J. Provide copies of field logs/notes and field screening data during excavation activities.

K. Closeout and maintenance material submittals: per Section 01300 Requirements.
1.04 QUALITY ASSURANCE

A. Provide in accordance with Section 01300 Requirements.

B. The selected and Owner-approved LSP shall be in good standing and have completed at least 3 Utility-Related Abatement Measures since the 2014 changes to the MCP in urban areas where historic fill was with releases of oil and/or hazardous materials that were released to the environment.

C. Handle, transport and dispose of contaminated soil, material, and water in accordance with applicable Laws and Regulations and disposal facility acceptance criteria.

D. Perform work in accordance with Response Action Performance Standards identified in the Massachusetts Contingency Plan and other federal, state, and local Laws and Regulations

E. Provide workers that are OSHA certified in accordance with Article 1.02 and Articles 1.03 E and F above.

PART 2 PRODUCTS

2.01 GROUNDWATER TREATMENT AND SOIL MANAGEMENT

A. Provide groundwater treatment system(s) capable of treating and disposing of groundwater in compliance with all federal, state and local Laws and Regulations.

B. Complete, file and obtain all permits required for groundwater treatment and discharge or disposal.

C. Provide all labor, tools, equipment and materials required to manage and dispose of soils in accordance with the Massachusetts Contingency Plan and all federal, state and local Laws and Regulations.

D. Complete, file and obtain all permits required for soil management and disposal.

PART 3 EXECUTION

3.01 GENERAL

A. Work shall be conducted under the direction of a Licensed Site Professional (LSP) approved by the Owner, licensed in the state where the Project is located and in good standing with the Board of Registration of Hazardous Waste Site Cleanup Professionals (LSP Board).
B. Review Work plan, including but not limited to, temporary and central stockpile and container locations, soil management plan, groundwater treatment and discharge plan, permitting and disposal facilities prior to beginning Work.

C. Perform Work in accordance with current standards of practice including environmental policies, guidance documents, and regulations. Schedule and complete Work in a manner that will minimize delays and construction costs.

D. Review available boring and test pit logs, records of explorations and other publicly available (municipal and state environmental records) and pertinent data for the Project. Use this information to prepare an accurate change order price for Work.

E. Notify the Owner and Engineer immediately of unexpected and undocumented environmental subsurface conditions that will impact the quality and installation of the Work. Owner and Engineer will inspect the conditions and evaluate options with Contractor. If directed, discontinue Work in impacted area and proceed with other Project Work. Claims associated with delays or mobilization to other area of Work shall not be considered for payment.

F. If notification conditions under applicable Laws and Regulations are required, LSP shall notify the Owner or Engineer immediately such that the Owner or their designee can notify DEP within the appropriate regulatory timeframe.

G. Perform Work where contaminated materials are discovered over consecutive Work days unless precipitation and severe weather prevent the safety of the Work or exacerbates site conditions. Do not perform work during severe weather (i.e., thunder and lightning). In the event that precipitation occurs during conduct of Work that would present safety concerns or exacerbate site conditions, cease Work immediately and cover soil/material stockpiles, and soil/material storage locations with polyethylene liners.

H. Manage, handle, transport and dispose of contaminated soil, material, and water in accordance with applicable Laws and Regulations.

I. Reuse soils and materials to the extent allowable by Laws and Regulations. When Laws and Regulations permit reuse of soils and materials, maximize reuse as approved and directed by Owner.

3.02 CONTAMINATED SOIL AND MATERIAL MANAGEMENT

A. Provide all labor, equipment, materials, and supplies necessary for the proper excavation, handling, and management, of contaminated soil and materials, temporary stockpiling or storage of contaminated soil and materials in containers, laboratory
characterization, loading, transportation, and disposal of contaminated soil and materials in each area of Work.

B. Temporary and Central Stockpile Location and Management

1. The approved LSP shall coordinate sampling and analysis of soil and materials stockpiled or stored in containers.

2. Coordinate and schedule Work such that the movement of soil and materials at the Work zone and between the Work zone and central stockpile/storage location is minimized. Revise soils management practices at no additional cost to the Owner, if, in the Owner’s opinion, more efficient management practices can be implemented.

3. Cover contaminated soil and material stockpiles and storage containers at the end of each day, during periods of non-use, and when transported on public ways to minimize release of dust, or erosion from storm events.

4. Place stockpiled contaminated soil and materials on polyethylene sheeting of at least 6 mils in thickness. Immediately cover stockpiles with polyethylene sheeting of at least 6 mils in thickness or other suitable impermeable material with physical properties capable of resisting tearing. Properly secure cover at the base and across the stockpile to protect the pile from the elements and prevent wind from moving the cover.

5. Provide stockpile slopes that comply with OSHA Regulations and local codes and Laws and Regulations.

6. Place contaminated soil and materials generated from each area of Work into separate stockpiles at the central stockpile location. Mark each stockpile and storage container with location where contaminated soil and materials were removed.

7. Maintain stockpiles and containers at the temporary and central storage locations. Check stockpiles and storage containers daily during normal working hours and repair, replace or re-secure the protective coverings to the satisfaction of the Engineer and Owner. Improperly constructed or maintained stockpiles and storage containers shall be replaced or repaired at no additional cost to the Owner.

C. Arrange for legal disposal of the contaminated soil and material at an authorized facility in accordance with Laws and Regulations.

D. Transport contaminated soil and material to the approved disposal facility within the timeframes provided in Laws and Regulations.

3.03 CONTAMINATED WATER MANAGEMENT

A. LSP shall coordinate sampling and analysis of water accumulated in excavations and appropriately characterize and measure thickness of any non-aqueous phase liquid.
B. Contractor shall provide a groundwater extraction, management, and treatment system necessary to meet applicable discharge requirements, permits, Laws and Regulations. Replace or repair equipment at no additional cost to the Owner.

C. When necessary, provide oil and hazardous material-resistant pumps and hoses that are intrinsically safe for use in the transfer of contaminated water. Ensure pumps and hoses are well maintained and allow examination by the Engineer. Replace or repair leaking pumps and hoses at no additional cost to the Owner.

D. Off-Site Water Disposal

1. Manage contaminated water in accordance with applicable Laws and Regulations.

2. Pump contaminated water into either a vacuum truck operated by a licensed hazardous waste transporter (for volumes of water up to 3,000 gallons) or into portable, bulk liquid storage tank(s) for larger volumes and transport to an approved off-Site location for disposal.

3. Coordinate and prepare necessary documentation for legal disposal of the contaminated water at an authorized facility in accordance with Laws and Regulations.

4. Transport contaminated water to the selected disposal facility under the proper documentation within the timeframes and requirements provided in Laws and Regulations.

E. On-Site Water Treatment and Disposal

1. Manage contaminated water in accordance with applicable Laws and Regulations.

2. Provide for on-Site handling, treating and disposing of contaminated water removed from excavations. Obtain an emergency Remediation General Permit or temporary sewer discharge permit for the disposal of treated water to a storm drain or waterway, if required.

3. Treat contaminated water by approved means to comply with applicable permits, Laws and Regulations.

4. Test effluent as required to ensure compliance with applicable permits, Laws, and Regulations.

END OF SECTION
PART 1  GENERAL

1.01  SUMMARY

A. Dewatering specified in this section is applicable to utilities and all other structures.

B. Section Includes

1. Requirements for designing, furnishing, installing, maintaining, operating and removal of temporary dewatering systems required to lower and control water levels and hydrostatic pressures during construction.

2. Requirements for disposing of pumped water.

1.02  DEFINITIONS

A. Dewatering: Lowering the zone of saturation and intercepting groundwater seepage which would otherwise emerge from the slopes or bottom of the excavations. The purposes of dewatering are to increase the stability of excavated slopes; prevent loss of material from beneath the slopes or bottom of the excavation; improve the excavating and hauling characteristics of on site soil; prevent rupture or heaving of the bottom of an excavation; and dispose of pumped water. In addition, dewatering is required to place and compact structural fill.

1.03  DESIGN REQUIREMENTS

A. The Contractor is responsible for the adequacy of the dewatering system.

B. Design dewatering systems to:

1. Effectively reduce the hydrostatic pressure and lower the groundwater levels to a minimum of 2 feet below excavation in soil;

2. Develop a substantially dry and stable subgrade for the protection of subsequent operations;

3. Result in no damage to adjacent buildings, structures, utilities and other work, included in this contract.

4. Depressurize stratified layers of sand that may be confined by silt layers so that a stable excavation bottom is maintained.

C. Methods may include sump pumping, single or multiple stage well point or jet eductor well point systems, deep wells, or combinations thereof.

D. Locate dewatering facilities where they will not interfere with existing utilities, facilities and/or construction work to be done under this Contract.
E. Contractor is responsible to obtain all necessary permits from state and local authorities regarding the operation and discharge of the dewatering system, and to conduct all necessary sampling and testing that may be required by those authorities.

1.04 SUBMITTALS

A. Shop Drawings
   1. In accordance with Section 01300 submit the following prior to dewatering system installation:
      a. Proposed system components.
      b. Operational plan to include locations and depth of components.
      c. Method of disposal of pumped water, including method of insuring proper sediment removal should upset in dewatering system occur.

B. Quality Assurance/Control Submittals
   1. In accordance with Section 01300 submit the following:
      a. Dewatering systems to be designed under the direct supervision of a professional Civil Engineer registered in the state which the work is to be done.
      b. Complete Certificate of Design at the end of this section.
      c. Provide documentation demonstrating ability and experience of installing contractor for the type of conditions under this contract.
      d. Names, addresses and telephone numbers of supervisory personnel actively involved in at least five successful projects requiring dewatering.

1.05 PROJECT/SITE CONDITIONS

C. Environmental Requirements
   1. Dispose of all pumped water in accordance with the City of Quincy Conservation Commission and Department of Public Works requirements

D. Existing Conditions
   1. Groundwater surface is subject to fluctuations during periods of heavy precipitation.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 SITE PREPARATION

A. Surface Drainage
   1. Construct dikes, ditches, pipe lines, sumps or other means to intercept and divert precipitation and surface water away from excavations.

B. Drainage of Excavated Areas
1. Construct dikes, ditches, pipe lines, sumps or other means to collect surface and seepage water which may enter the excavation.

2. Discharge water through settling basins or method approved by Engineer when water is to be deposited into an existing watercourse.

3.02 INSTALLATION

A. Advise Engineer of changes made to Operation Plan as submitted under article 1.05 of this section, made to accommodate field conditions.

3.03 MONITORING

A. Observe and record daily the elevation of the groundwater during the length of the dewatering operation and provide data to Engineer on daily basis.

3.04 OPERATION

A. Operate dewatering systems to lower the groundwater level in excavations allowing all subsequent work to be done on a stable dry subgrade.

B. Modify dewatering procedures which cause, or threaten to cause, damage to new or existing facilities, to prevent further damage. Modifications made at no additional expense to the Owner.

C. Maintain the water level a minimum of two (2) feet below subgrade or at lower elevation to eliminate hydrostatic pressure on structures.

D. Prevent disturbance of foundation soils and loss of ground as water is removed.

E. Notify the Engineer of disturbance to the foundation soils caused by an interruption or inadequacy of the dewatering system.

F. Maintain on site, auxiliary equipment to operate the dewatering system continuously while excavations are opened below elevation of final grade.

3.05 DISPOSAL OF WATER

A. Discharge water in a manner that will not cause erosion, flooding, damage to existing facilities, completed Work or adjacent property, improved or otherwise.

3.06 REMOVAL

A. Remove all material and equipment from the site upon completion of dewatering operations.

B. Seal all dewatering wells upon completion of the dewatering by pressure injecting a grout capable of sealing the wells and preventing leakage.

END OF SECTION
CERTIFICATE OF DESIGN

Re: Contract Between

OWNER: ________________________________________________________

(Name)

and

CONTRACTOR:  ________________________________________________________

(Name)

on

CONTRACT: ________________________________________________________

(Title)

Dated:__________________

(Number)

Contractor hereby certifies that___________________________________________

(Designer)

1. Is licensed or registered to perform professional engineering work in the state of

______________________________________________

(Location of Project)

2. Is qualified to design the__________________________________________________

(Item)

specified in Section__________ of the subject contract;

3. Has designed_______________________________________________________before;

4. Has prepared the design in full compliance with the applications and requirements of

Section_______ of subject contract including all applicable laws, regulations, rules and

codes; and

5. The work has been signed and sealed pursuant to the applicable state law.

FOR: ______________________________________

(Contractor)

BY: ______________________________________

(Signature)

______________________________________ Dated:__________________

(Name and Title)
PART 1 GENERAL

1.01 DESCRIPTION

A. The Contractor shall properly design and furnish all labor and materials necessary and shall construct complete, all sheeting, bracing supports, and appurtenances required to perform the Work including sheet piling for construction of structures and buildings, trench support and cofferdams, permanent and temporary alike, as indicated on the Drawings and specified or as otherwise directed by the Engineer or required by agencies having jurisdiction over the Work.

B. Wood timber or steel sheeting shall be used except where otherwise indicated, specified or directed by the Engineer and agencies having jurisdiction over the work.

1.02 DESIGN RESPONSIBILITY

A. The Contractor shall be fully responsible for providing complete and adequately designed sheeting as required and/or directed by the Engineer in accordance with the provisions set forth herein. The sheeting shall be designed to resist hydrostatic pressures in accordance with the Contractor's dewatering design.

B. The Contractor shall engage, at his own expense, the services of a fully competent and qualified Professional Engineer, hereinafter referred to as the "Contractor's Engineer", registered in the State in which the Work is being constructed, for the design of all sheeting requirements to accomplish the Work specified, and for supervising the proper on-site installation associated therewith. The Contractor's Engineer shall be acceptable to the Engineer and demonstrate a minimum of ten (10) years documented experience in the field of sheeting design and implementation. Prior to the actual employment of the Contractor's Engineer, the Contractor shall submit to the Engineer, to the full extent deemed necessary, a detailed resume stating the Contractor's Engineer's professional qualifications, related experience and references, and if requested, examples of work similar to that required for the Work specified, for a general review by the Engineer and a means of documenting the requisite experience hereinbefore specified. Only after a satisfactory review of the Contractor's Engineer's overall qualifications by the Engineer in fulfillment of the requisite experience hereinbefore specified shall the Contractor finalize such employment and begin the design aspects of the Work.

C. The Contractor's attention is directed to the fact the acceptance of the Contractor's Engineer and/or his/her qualifications by the Owner and/or Engineer shall not be an overall approval of the Contractor's Engineer nor the sheeting designs and methods of installation employed during the Work. It being understood that all sheeting requirements necessary to accomplish the Work specified and/or indicated on the Drawings shall be designed by and installed under the direct supervision of the Contractor's Engineer who shall ultimately and fully bear the responsibility for that Work.
1.03 QUALITY ASSURANCE

A. The Contractor's Engineer shall provide and maintain throughout the sheeting installation and/or Work sufficient supervision and technical guidance to the Contractor for proper sheeting materials, equipment, operations and methods to the extent necessary to assure strict compliance with the Contractor's Engineer's design, all safety procedures and standard requirements for such Work, and the successful completion of the Work. Failure to provide and/or maintain such supervision and/or technical guidance during the Work shall in no way relieve the Contractor's Engineer and/or the Contractor from their overall responsibilities and obligations under the Contract, nor shall it be a basis for any claim by either against the Owner and/or Engineer.

B. The Contractor and Contractor's Engineer shall fully indemnify and save harmless the Owner and Engineer and their agents, employees and representatives, from and against any and all claims as stipulated under the Agreement, whether directly or indirectly arising out of, relating to or in connection with the Work.

C. Quality assurances and proper safety procedures must be maintained at all times and be in strict accordance with the Contractor's Engineer's requirements and consistent with all federal, state and local regulatory agencies having jurisdiction over the Work. Should any conflict in requirements, regulations, restrictions or codes exist between that which is specified by the Contractor's Engineer and any federal, state or local agency, the more stringent application shall prevail.

1.04 PRODUCTS AND DESIGN CRITERIA

A. The overall sheeting design, quality of materials and methods of installation for all sheeting applications necessary to accomplish the Work specified shall be consistent with the established standards of the construction industry and must, as a minimum, comply with the requirements for earth support systems for excavations as defined by current US Department of Labor, Occupational Safety and Health Act (OSHA) regulation applicable thereto, and any other federal, state and local agencies having jurisdiction over the Work. Should any conflict in requirements, regulations, restrictions or codes exist between that which is specified by the Contractor's Engineer and any federal, state or local agency, the more stringent application shall prevail.

B. The Contractor and Contractor's Engineer's attention is directed to the fact that should any additional investigations, subsurface explorations and/or other appurtenant information be required to fulfill the needs of this design, as determined by the Contractor's Engineer above
and beyond that which is already provided under these Contract Documents, the Contractor shall obtain all such information and data required at his own expense.

1.05 SHOP DRAWINGS AND/OR DESCRIPTIVE LITERATURE

A. Prior to the installation of any sheeting, the Contractor shall submit to the Engineer for documentation ONLY, complete sheeting layout and detail drawings and sheeting descriptions bearing the Contractor's Engineer's State of Massachusetts Professional Seal and signature. Said submission shall be for informational purposes only as a means of documenting the work to be performed and will not be considered an approval or disapproval of the design and/or the implementation thereof. This submission will not relieve the Contractor of the sole responsibility for the adequacy of the system nor shall it be construed as an approval or guarantee that the Contractor's proposed equipment, materials and methods for the sheeting, bracing or appurtenances will be adequate for the work required at the locations of and for the Work required by this Contract.

B. Included as part of this submission, the Contractor's Engineer must provide a complete listing of all references, codes and specifications used by the Contractor's Engineer and required by any federal, state or local agency having jurisdiction, and to which the sheeting design conforms.

C. Specific design calculations are not to be submitted to the Engineer. In the event design calculations are submitted to the Engineer, they shall be returned to the Contractor without review nor checking by the Engineer.

1.06 CERTIFICATE OF DESIGN

A. The Contractor's special attention is directed to the required "Certificate of Design", the form of which is provided at the end of this Section. The Contractor and Contractor's Engineer shall complete this "Certificate" in its entirety for each location of work to be done, and any revisions associated therewith, and submit it simultaneously with, as an integral part thereof, the sheeting submission. Any submission made without the completed "Certificate", appropriately signed and sealed, shall be returned to the Contractor. The Owner and/or Engineer hereby reserves the right to delay sheeting work and/or any work associated with, or dependent upon, the proper implementation of sheeting, without cause for claim against the Owner or Engineer, until a complete and appropriate submission is rendered. This Certification shall indicate that the sheeting, bracing and all appurtenances related thereto are designed to withstand the required loads, forces to be encountered, and to provide soil and water control, and are in compliance with these specifications and all federal, state or local agencies having jurisdiction over the Work to be performed.

PART 2 PRODUCTS

2.01 MATERIALS

A. Timber sheeting and bracing:
1. Timber sheeting and bracing may be of any species of wood which will satisfactorily withstand all driving and construction stresses and the loads to which the members will be subjected. Sheeting shall not be less than 3 inches nominal thickness and shall be provided with continuous interlocks. All timber sheeting and bracing shall be free from worm-holes, windshakes, loose knots, decayed or unsound portions or other defects which might impair its strength or tightness.

B. Steel sheeting:

1. The shapes, sizes, and lengths of steel sheeting to be utilized are optional with the Contractor, providing they are satisfactory to withstand all driving and construction stresses and provided with continuous interlocks.

C. Bracing, Hardware and Fastenings:

1. Bracing and other supports whether of steel or of timber, shall be of the strength and dimensions necessary to satisfactorily withstand the loads to which they will be subjected. All bracing and other supports shall be free from any defects which might impair this strength. The Contractor shall provide all necessary hardware and fastenings necessary in connections with satisfactory installation of all sheeting and bracing.

PART 3 EXECUTION

3.01 INSTALLATION

A. The Contractor shall be fully responsible for ensuring adequate safety measures are provided at all times and shall comply with all safety requirements of federal, state and local agencies having jurisdiction over the Work. Installation of the sheeting including all bracing, supports and appurtenances, shall be adequate to permit the performance of the Work and be in accordance with the requirements of the Contractor's Engineer and the sheeting design associated therewith.

B. Any movements of sheeting and/or appurtenances which prevent the proper completion of the work shall be corrected at the expense of the Contractor.

C. Sheeting shall be installed in a manner which will prevent the disturbance of the surrounding surface, subsurface conditions and/or structures. Any such disturbances shall be corrected at the Contractor's expense and to the satisfaction of the Engineer.

D. All sheeting shall be removed except as shown on the Contract Drawings or directed by the Engineer.

E. All sheeting approved for removal by the Engineer shall become the property of the Contractor.

F. All restoration and clean up shall be as indicated and as specified.
CERTIFICATE OF DESIGN

_________________________________________ (Owner)

Contract Reference: _____________________________________________________________

_________________________________________, dated _________.

In accordance with the provisions of the above referenced Contract, as the designated Contractor,

_________________________________________ (Contractor’s Name and Address)

hereby certifies that _____________________________________________________________

_________________________________________ (Contractor’s Engineer’s Name and Address)

(1) Is properly licensed and currently registered as a Professional Engineer in the State (or
Commonwealth) of ________________________________________________:

(2) Is fully qualified to design and supervise the ________________________________

(3) Has successfully designed and supervised ___________________________________

before and demonstrates a minimum of ten (10) documented years of proven experience in such
field;

(4) Has personally examined the type(s) and locations(s) of the Work required under this
Contract, and the overall conditions associated therewith, to the extent necessary to fully
satisfy his or her professional responsibilities for designing and supervising the above
referenced work;
(5) Has prepared the attached design in full compliance with the applications and requirements of the Contract Documents, sound engineering practice, modern accepted principles of construction, and all applicable federal, state and local laws, regulations, rules and codes having jurisdiction over the Work;

(6) Will provide sufficient supervision and technical guidance to the Contractor throughout the Work to ensure compliance with the design and all quality assurances necessary to successfully complete the Work;

(7) Hereby indemnifies and holds harmless the__________________________________

__________________________________ and BETA Group, Inc.,

(name of owner)

and their agents, employees and representatives, from and against any and all claims, whether directly or indirectly, arising out of, relating to or in connection with the Work; and

(8) This "Certificate of Design" together with all applicable designs, drawings, details, specifications on other related documents necessary to complete the Work as specified, have been signed and sealed pursuant to applicable state law.

In recognition and observance of the above referenced statements, the undersigned parties hereby acknowledge and accept the responsibilities and obligations associated therewith.

CONTRACTOR:  

__________________________________  (Contractor's Name)  

By:  ____________________________  (Name and Title)

Date:  ____________________________  (SEAL)

CONTRACTOR'S ENGINEER:  

__________________________________  (Engineer's Name)  

By:  ____________________________  (Name and Title)

Date:  ____________________________  (P.E. STAMP)
SECTION 02200

EARTH EXCAVATION, BACKFILL, FILL AND GRADING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for; excavating in earth for trenches and structures; backfilling excavations; furnishing necessary material; compaction; constructing embankments and fills; miscellaneous earth excavations and miscellaneous grading.

B. Related Sections

1. Section 01025 - Measurement and Payment
2. Section 01410 - Testing Laboratory Services
3. Section 02140 – Dewatering
4. Section 02149 – Maintaining Existing Flow
5. Section 02160 – Excavation Support
6. Section 02215 - Aggregate Materials
7. Section 03300 - Cast-In-Place Concrete

1.02 REFERENCES


1. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).

1.03 MEASUREMENT AND PAYMENT PROCEDURES

A. Sheeting

1. As specified in SECTION 01025, Contractor paid only for certain sheeting left in place.

B. Test Pits

1. Where determination of the exact location of pipe or other underground structure is necessary for doing the work properly, the Contractor may be required to excavate test pits to determine such locations. When such test pits may be properly considered as incidental to other excavation, the Contractor shall receive no additional compensation, the work being understood to be included as part of the excavation. When the Engineer orders test pits beyond the limits of excavation he considers a part of the work, such test pits shall be paid for as specified in SECTION 01025.

1.04 QUALITY ASSURANCE

A. Field Samples

1. Provide samples of materials as requested by the Engineer, to the Quality Control Engineer hired by the Owner, prior to delivery of materials on site, in order to facilitate field testing of compaction operations and material properties.
1.05 PROJECT/SITE CONDITIONS

A. Existing Conditions

1. There are pipes, drains, and other utilities in locations not indicated on drawings, no attempt has been made to show all services, and completeness or accuracy of information given is not guaranteed.

1.06 MAINTENANCE

A. Maintain all work in accordance with SECTION 01800.

PART 2 PRODUCTS

2.01 MATERIALS

A. Suitable Aggregate

1. The nature of materials will govern both acceptability for backfill and methods best suited for placement and compaction.
2. All material whether from excavations or from borrow pits, after being placed and properly compact, will make a dense stable fill and containing no vegetation, masses of roots, individual roots more than 18 inches long, or more than 1/2 inch in diameter, stones over 6 inches in diameter, or porous matter.
3. Organic matter to be well distributed and not to exceed minor quantities.

B. Trench and Excavation Backfill

1. In general, and unless other material is indicated on drawings or specified, material used for backfilling trenches and excavations shall be suitable material which was removed in the course of making the construction excavations. If sufficient suitable material is not available from the excavations, the backfill material shall be crushed stone, gravel borrow or select borrow as directed by the Engineer, in accordance with respective Specification Sections.

C. Structure Backfill

1. Unless otherwise indicated or specified, all fill and backfill under structures and pavement adjacent to structures shall be compacted gravel borrow containing not more than 10 percent material passing a 200 sieve. When coarse aggregate and fine aggregate are indicated or specified for use under structures, they shall conform to the requirements for coarse and fine aggregate specified in SECTION 03300.

D. Filling and Embankment Backfill

1. Suitable selected materials available from the excavations and not required for backfill around pipes or against structures may be used for filling and building embankments, except as otherwise specified. Material needed in addition to that available from construction operations shall be obtained from suitable gravel banks or other suitable deposits. The Contractor shall furnish, at his own expense, all borrow material needed on the work.

E. Additional materials
1. Concrete: In accordance with SECTION 03300.
2. Crushed stone: In accordance with SECTION 02215.
3. Gravel borrow: In accordance with SECTION 02215.
4. Select borrow: In accordance with SECTION 02215.

2.02 EQUIPMENT

A. Well Points
   1. Designed to drain soil and prevent saturated soil from flowing into excavation.

B. Pumping Units
   1. Designed for use with the wellpoints, capable of maintaining a high vacuum and, handling large volumes of air and water at the same time.

C. Underdrain Pipe
   1. HDPE pipe enclosed in crushed stone encased in filter fabric.
   2. Sewer pipe of quality known as "seconds".

2.03 SOURCE QUALITY CONTROL

A. Provide Engineer with access to location of off site sources of materials.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify all existing utilities and facilities prior to excavation.

3.02 PROTECTION

A. Utilities
   1. Support and protect from damage existing pipes, poles, wires, fences, curbing, property line markers, and other structures, which the Engineer decides must be preserved in place without being temporarily or permanently relocated.
   2. Restore items damaged during construction without compensation, to a condition at least equal prior to construction.

B. Trees
   1. Enclose the trunks of trees adjacent to work with substantial wooden boxes of height necessary to protect trees from injury from piled material, equipment, operations or otherwise.
   2. Employ excavating machinery and cranes of suitable type and size and operate with care to prevent injury to trees not to be cut and particularly to overhanging branches and limbs.
   3. When trimming is required, make all cuts smooth and neat without splitting or crushing.
   4. Cover cut areas with an application of grafting wax or tree healing paint.
   5. Branches, limbs, and roots shall not be cut except by permission of the Engineer.

C. Plantings
1. Protect by suitable means or temporarily replant and maintain cultivated hedges, shrubs, and plants which may be injured by the Contractor's operations.
2. Replant in their original positions and care for until growth is re-established, once the construction operations have been substantially completed.
3. If cultivated hedges, shrubs, and plants are injured to such a degree as to affect their growth or diminish their beauty or usefulness, they shall be replaced by items of kind and quality at least equal to which existed prior to the start of the Work.

D. Paved surfaces
1. Do not use or operate tractors, bulldozers, or other power-operated equipment with treads or wheels shaped as to cut or injure paved surfaces.
2. All surfaces which have been injured by the Contractor's operations shall be restored to a condition at least equal to which existed prior to start of the Work.
3. Suitable materials and methods shall be used for such restoration.

3.03 PREPARATION

A. Pavement Removal
1. Remove only existing pavement as necessary for the prosecution of the work.
2. Engineer may require that pavement be cut with pneumatic tools or saws without extra compensation to Contractor, where in the opinion of the Engineer it is necessary to prevent damage to the remaining road surface.
3. Dispose large of pieces of broken pavement before proceeding with excavation.

B. Top Soil Removal
1. From areas which excavations are to be made, loam and topsoil shall be carefully removed and separately stored to be used again as directed; or, if the Contractor prefers not to separate surface materials, he shall furnish, as directed, loam and topsoil at least equal in quantity and quality to that excavated.

C. Subgrade
1. Remove loam and topsoil, loose vegetable matter, stumps, large roots, etc., from areas where embankments will be built or material will be placed for grading.
2. Shape as indicated on the drawings and prepare by forking, furrowing, or plowing to bond first layer of the new material placed.

3.04 RELOCATION AND REPLACEMENT OF EXISTING STRUCTURES

A. The structures to which the provisions of this article apply include pipes, wires, and other structures which meet all of the following:
1. Are not indicated on the drawings or otherwise provided for.
2. Encroach upon or are encountered near and substantially parallel to the edge of the excavation.
3. In the opinion of the Engineer will impede progress to such an extent that satisfactory construction cannot proceed until they have been changed in location, removed (to be later restored), or replaced.

B. In removing existing pipes or other structures, the Contractor should use care to avoid damage to materials, and the Engineer shall include for payment only those new materials which, in his judgment, are necessary to replace those unavoidably damaged.
C. Whenever the Contractor encounters certain existing structures as described above and is so ordered in writing, he shall do the whole or such portions of the work as he may be directed to change the location of, remove and later restore, or replace such structures, or to assist the Owner thereof in so doing. For all such work, the Contractor shall be paid under such items of work as may be applicable, otherwise as Extra Work.

D. When fences interfere with the Contractor's operations, he shall remove and (unless otherwise specified) later restore them to a condition which existed prior to the start of the Work, all without additional compensation. The restoration of fences shall be done as promptly as possible and not left until the end of the construction period.

3.05 SHEETING AND BRACING

A. Provide in accordance with specification Section 02160.

3.06 DEWATERING

A. Provide in accordance with specification Section 02140.

3.07 EXCAVATION

A. Execute operation of dewatering, sheeting and bracing without undermining or disturbing foundations of existing structures or of work previously completed under this contract.

B. Excavate to widths that provide suitable room for:
   1. Building structures or laying and jointing piping.
   2. Placing all sheeting, bracing, and supports.
   3. Cofferdamming, pumping and draining.

C. Render bottom of excavations firm, dry and acceptable in all respects.

D. Do not plow, scrap or dig by machinery, earth at finished subgrade which results in disturbance of material below subgrade, unless indicated or specified, and remove with pick and shovel, last of material to be excavated, just before placing pipe, masonry or other structure.

E. Make all excavations in open, except as otherwise specified or permitted.

F. Excavation Near Existing Facilities

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

G. Unauthorized Excavation

   1. If the bottom of any excavation is taken out beyond the limits indicated or prescribed, the resulting void shall be backfilled at the Contractor's expense with thoroughly compacted gravel borrow, if the excavation was for a pipeline, or with Class B concrete, if the excavation was for a masonry structure.
H. Unsuitable Material

1. If material unsuitable for foundation (in the opinion of the Engineer) is found at or below the grade to which excavation would normally be carried in accordance with the Drawings and/or Specifications, the Contractor shall remove such material to the required width and depth and replace it with thoroughly compacted, crushed stone, gravel borrow, fine aggregate or concrete as directed.

3.08 TRENCHING

A. Trench Excavation

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

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

B. Depth Of Trench

1. Excavate trench to depths permitting the pipe to be laid at the elevations, slopes, or depths of cover indicated on the drawings, and at uniform slopes between indicated elevations.

C. Width Of Trench

1. Excavate trench as narrow as practicable and do not widen by scraping or loosening materials from the sides. Every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed and consolidated.

2. Excavate trenches with approximately vertical sides between the elevation of the center of the pipe and an elevation 1 ft. above the top of the pipe.

D. Trench Excavation In Fill

1. If pipe is to be laid in embankments or other recently filled material, the material shall first be placed to the top of the fill or to a height of at least 1 ft. above the top of the pipe, whichever is the lesser. Particular care shall be taken to ensure maximum consolidation of material under the pipe location. The pipe trench shall then be excavated as though in undisturbed material.

E. Length of trench open at any one time will be controlled by conditions, subject to any limits that may be prescribed by Engineer.

3.09 BACKFILLING

A. General

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

B. Fill And Backfill Under Structures
1. The fill and backfill materials shall be placed in layers not exceeding 6 in. in thickness. Unless otherwise indicated or specified, each layer shall be compacted to 95 percent in accordance with ASTM D1557.

C. Backfilling Around Structures

1. Do not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking, or other damage. As soon as practicable after the structures are structurally adequate and other necessary work has been done, special leakage tests, if required, shall be made. Promptly after the completion of such tests, the backfilling shall be started and then shall proceed until its completion. The best of the excavated materials shall be used in backfilling within 2 ft. of the structure. Unequal soil pressures shall be avoided by depositing the material evenly around the structure.

2. The material shall be placed and compacted to 90 percent in accordance with ASTM D1557 unless otherwise indicated or specified.

D. Backfilling Pipe Trenches

1. As soon as practicable after the pipes have been laid and the joints have acquired a suitable degree of hardness, if applicable, or the structures have been built and are structurally adequate to support the loads, including construction loads to which they will be subjected, the backfilling shall be started and thereafter it shall proceed until its completion.

2. With the exception mentioned below in this paragraph, trenches shall not be backfilled at pipe joints until after that section of the pipeline has successfully passed any specified tests required. Should the Contractor wish to minimize the maintenance of lights and barricades and the obstruction of traffic, he may, at his own risk backfill the entire trench, omitting or including backfill at joints as soon as practicable after the joints have acquired a suitable degree of hardness, if applicable, and the related structures have acquired a suitable degree of strength. He shall, however, be responsible for removing and later replacing such backfill, at his own expense, should he be ordered to do so in order to locate and repair or replace leaking or defective joints or pipe.

3. No stone or rock fragment larger than 12 in. in greatest dimension shall be placed in the backfill nor shall large masses of backfill material be dropped into the trench in such a manner as to endanger the pipeline. If necessary, a timber grillage shall be used to break the fall of material dropped from a height of more than 5 ft. Pieces of bituminous pavement shall be excluded from the backfill unless their use is expressly permitted, in which case they shall be broken up as directed.

4. Zone Around Pipe
   a. Backfilled with the materials and to the limits indicated on the drawings.
   b. Material shall be compacted to 90 percent by tamping.

5. Remainder of Trench
   a. Compact by water-jetting, or tamping, in accordance with the nature of the material to 95 percent in accordance with ASTM D1557. Water-jetting may be used wherever the material does not contain so much clay or loam as to delay or prevent satisfactory drainage. However, tamping shall be used if water-jetting does not compact the material to the density required.

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

E. Placing And Compacting Embankment Material

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

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

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

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

5. The portion of embankments constructed below proposed structures shall be compacted to 95 percent in accordance with ASTM D1557. The top 2 ft. of an embankment below a pavement base shall be compacted to 95 percent. All other embankments shall be compacted to 90 percent in accordance with ASTM D1557.

3.10 METHODS OF COMPACTION

A. Water-Jetting

1. Saturate backfill material throughout its full depth and at frequent intervals across and along the trench until all slumping ceases.

2. Furnish one or more jet pipes, each of sufficient length to reach the specified depth and of sufficient diameter (not less than 1-1/4 in.) to supply an adequate flow of water to compact the material.

3. Equip jet pipe with a quick-acting valve, supply water through a fire hose from a hydrant or a pump having adequate pressure and capacity to achieve the required results.

B. Tamping and Rolling

1. Deposit backfill material and spread in uniform, parallel layers not exceeding 8 in. thick before compaction. Before the next layer is placed, each layer shall be tamped to obtain a thoroughly compacted mass. Care shall be taken that the material close to the bank, as well as in all other portions of the trench, is thoroughly compacted. When the trench width and the depth to which backfill has been placed are sufficient to make it feasible, and it can be done effectively and without damage to the pipe, backfill may, on approval, be compacted by the use of suitable rollers, tractors, or similar power equipment instead of by tamping. For compaction by tamping (or rolling), the rate at which backfilling material is deposited in the trench shall not exceed that permitted by the facilities for its spreading, leveling, and compacting.
2. If necessary to ensure proper compaction by tamping (or rolling), the backfill material shall first be wet by sprinkling. However, no compaction by tamping (or rolling) shall be done when the material is too wet either from rain or too great an application of water to be compacted properly; at such times the work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compacting, or such other precautions shall be taken as may be necessary to obtain proper compaction.

C. Miscellaneous Requirements.

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

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

3.11 DISPOSAL OF SURPLUS EXCAVATED MATERIALS

A. No excavated materials shall be removed from the site of the work or disposed of by the Contractor except as directed or permitted by the Engineer.

B. Surplus excavated materials suitable for backfill shall be used to backfill normal excavations in rock or to replace other materials unacceptable for use as backfill; shall be neatly deposited and graded so as to make or widen fills, flatten side slopes, or fill depressions; or shall be neatly deposited for other purposes within a haul of 1 mile from the point of excavation; all as directed or permitted and without additional compensation.

C. Surplus excavated materials not needed as specified above shall be hauled away and dumped by the Contractor, at his expense, at appropriate locations, and in accordance with arrangements made by him.

3.12 DISPOSAL OF SPECIAL WASTES

A. The Contractor's attention is directed to the requirements set forth by the State of Massachusetts, Department of Environmental Protection, (MA DEP) regarding "Special Wastes" and the proper disposal thereof. All waste materials and debris, as designated by the Owner and/or Engineer, including but not limited to any sewers, storm drains, catchbasins, and combined system pipelines and associated structures, or any portions thereof, including but not limited to sludge, grit, sediment, dirt, sand, rock, grease, roots and other liquid, solid or semi-solid materials contained therein, shall be considered "Special Wastes." In addition, any excavated soils contaminated in any manner, as designated by the Owner and/or Engineer, shall also fall under this category and shall be handled the same. When so encountered, all such materials and debris shall be removed to the extent so ordered by the Engineer and properly disposed of in strict compliance with the requirements of the MA DEP and other regulating authorities to an approved and certified waste disposal site. It shall remain the sole responsibility of the Contractor to apply for and obtain all required permits, bonds and/or insurance relative to such disposal. The Contractor shall also pay all costs associated with the disposal, required permits, bonds and insurance with no additional expense to the Owner. All handling of such "Special Waste" shall be done in strict compliance with the MA DEP requirements and/or any other federal, state or local agency
having jurisdiction or authority over the same. Under no circumstances shall sewage, solids or other "Special Wastes" removed from the sewer lines be dumped or spilled onto the streets or into ditches, catch basins or storm drains. The Contractor must use watertight and State approved vehicles in transporting any wastes as hereinbefore designated.

B. The Contractor shall indemnify and save harmless the Owner and Engineer and all persons acting for or on behalf of the Owner and Engineer from all claims and liability of any nature or kind, and all damages, costs and expenses, including attorney's fees and penalties, arising from the improper handling, transportation or disposal of "Special Wastes" as determined by the MA DEP and/or any other federal, state or local agency having jurisdiction or authority over the same.

3.13 DUST CONTROL

A. During the progress of the Work, maintain the area of activities, by sweeping and sprinkling of streets to minimize the creation and dispersion of dust. If the Engineer decides that it is necessary to use calcium chloride for more effective dust control, the Contractor shall furnish and spread the material, as directed.

3.14 BRIDGING TRENCHES

A. Provide suitable and safe bridges and other crossings where required for the accommodation of travel, and to provide access to private property during construction. Remove once bridges and crossings are no longer needed.

3.15 FIELD QUALITY CONTROL

A. Site Tests
   1. In accordance with SECTION 01410

3.16 CARE AND RESTORATION OF PROPERTY

A. Restoration of existing property or structures done as promptly as practicable and not left until the end of the construction period.

END OF SECTION
SECTION 02210
ROCK EXCAVATION

PART 1  GENERAL

1.01  SUMMARY

A. Section Includes
   1. Requirements for removal and disposal of rock.

B. Related Sections
   1. Section 00500-Agreement
   2. Section 00800- Supplementary Conditions
   3. Section 02200-Earth Excavation, Backfill, Fill and Grading

1.02  DEFINITIONS

A. Rock-as defined in SECTION 00500.

1.03  REQUIREMENTS

A. Excavate rock if encountered, to the lines and grades indicated on the drawings or as directed, dispose of the excavated material, and furnish acceptable material for backfill in place of the excavated rock.

B. Excavate rock in pipe trenches to a limit which provides 6-inches clearance minimum from the pipe after it has been laid. Before the pipe is laid, the trench shall be backfilled to the correct subgrade with thoroughly compacted, suitable material or, when so specified or indicated on the drawings, with the same material as that required for bedding the pipe, furnished and placed at the expense of the Contractor.

C. The use of explosives will not be allowed.

PART 2  PRODUCTS

NOT USED

PART 3  EXECUTION

3.01  EXCESS ROCK EXCAVATION

A. If rock is excavated beyond the limits of payment indicated on the drawings, specified, or authorized in writing by the Engineer, the excess excavation, whether resulting from overbreakage or other causes, shall be backfilled, by and at the expense of the Contractor, as specified below in this section.
B. In pipe trenches, excess excavation below the elevation of the top of the bedding, cradle, or envelope shall be filled with material of the same type, placed and compacted in the same manner, as specified for the bedding, cradle, or envelope. Excess excavation above said elevation shall be filled with earth as specified in the article titled "Backfilling Pipe Trenches" in SECTION 02200.

C. In excavations for structures, excess excavation in the rock beneath foundations shall be filled with 3000 psi concrete. Other excess excavation shall be filled with earth as specified in the article titled "Backfilling Around Structures" in SECTION 02200.

3.02 SHATTERING ROCK

A. In the event use of explosives are not allowed, shattering rock at ends of pipe and elsewhere as indicated on the drawings, shall be done by mechanical methods. Shattering shall be completed before any pipe or fitting is placed within 50 ft. of rock to be shattered.

3.03 SHATTERED ROCK

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

3.04 PREPARATION OF ROCK SURFACES

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

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

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

3.05 REMOVAL OF BOULDERS

A. Remove piles of boulders and loose rock encountered within the limits of earth embankments and dispose in a suitable place.
3.06 DISPOSAL OF EXCAVATED ROCK

A. All excavated rock shall be handled, transported and disposed of by the Contractor, at his expense, at appropriate locations, and in accordance with arrangements made by him without additional cost to the Owner.

B. Excavated rock may be used in backfilling trenches subject to the following limitations:
   1. Pieces of rock larger than permitted under the article titled "Backfilling Pipe Trenches" in SECTION 02200 shall not be used for this purpose.
   2. The quantity of rock used as backfill in any location shall not be so great as to result in the formation of voids.
   3. Rock backfill shall not be placed within 36 in. of the surface of the finish grade.

C. Surplus excavated rock shall be disposed of as specified for surplus excavated material as specified in SECTION 02200.

3.07 BACKFILLING ROCK EXCAVATIONS

A. Where rock has been excavated and the excavation is to be backfilled, the backfilling above normal depth shall be done as specified in SECTION 02200. If material suitable for backfilling is not available in sufficient quantity from other excavations, the Contractor shall, at his own expense, furnish suitable material from outside sources.

END OF SECTION
PART 1   GENERAL

1.01  SUMMARY

A. Section Includes
   1. Requirements for furnishing and placing materials, which include Crushed Stone, Gravel Borrow and Select Borrow.
   2. Location of specified materials as detailed on the Drawings or as directed by the Engineer for excavation below normal depth, utility support, replacement of unsuitable material or elsewhere, as ordered.

B. Related Sections
   1. Section 02200 - Earth Excavation, Backfill, Fill and Grading.
   2. Section 02500 - Paving

1.02  REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO).
   1. T11, Amount of Material Finer than 0.075 mm Sieve in Aggregate
   2. T27, Sieve Analysis of Fine and Coarse Aggregates.

   1. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³)).

1.03  DEFINITIONS

A. The term Screened Gravel as used in the Contract Documents shall mean Crushed Stone.

1.04  SUBMITTALS

A. Shop Drawings
   1. Provide sieve analysis when gradation requirements are given in the Specification.

B. Samples
   1. Furnish representative sample including location of source with Shop Drawing transmittal sheet.

1.05  QUALITY ASSURANCE

A. Field Samples
   1. The attention of the Contractor is directed to the fact that under Specification SECTION 00700, 1.03 Materials and Equipment, all materials furnished by the Contractor to be incorporated into the Work shall be subject to the inspection of the Engineer. The
Engineer shall be the sole judge as to the acceptability of proposed materials and said judgement shall be final, conclusive, and binding.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Storage and Protection
   1. In accordance with Specification SECTION 00700, 1.03 Materials and Equipment.

PART 2 PRODUCTS

2.01 MATERIALS

A. Crushed Stone
   1. For bedding and pipe zone material for pipe larger than 3 inches diameter. Well graded in size from 3/8 inches to 3/4 inches or such other sizes as may be approved.
   2. For bedding and pipe zone material for plastic pipe 3 inches diameter and less, maximum particle size shall be 3/8 inches.
   3. Clean, hard, and durable particles or fragments, free from dirt, vegetation, or other objectionable matter, and free from an excess of soft, thin elongated, laminated or disintegrated pieces.
   4. Screened Stone of similar size and grading to this specification may be used instead of Crushed Stone.

B. Gravel Borrow
   1. Granular material well graded from fine to coarse with a maximum size of 3 inches, obtained from approved natural deposits and unprocessed except for the removal of unacceptable material and stones larger than the maximum size permitted.
   2. Gravel shall not contain vegetation, masses of roots, or individual roots more than 18 inches long or more than 1/2 inches in diameter.
   3. Gravel shall be substantially free from loam and other organic matter, clay and other fine or harmful substances.
   4. Gradation requirements for gravel shall be determined by AASHTO-T11 and T27 and conform to the following:

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<thead>
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<th>Sieve</th>
<th>Percent Passing</th>
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<td>1/2 inch</td>
<td>60-95</td>
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<tr>
<td>No. 4</td>
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<tr>
<td>No. 50</td>
<td>8-28</td>
</tr>
<tr>
<td>No. 200</td>
<td>0-8</td>
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</table>

C. Select Borrow
   1. Use inorganic natural soils and/or rock, having not more than 8 percent by weight passing the No. 200 sieve and having a maximum stone size no greater than 6-inches.
   2. Use only material well-graded throughout entire size range, free of roots, leaves and other organic material, ice or frost and aggregations of frozen soil particles.
   3. Moisture content to be within plus minus 3 percent optimum at the borrow source.
   4. Material must meet compaction requirements indicated or as specified.

D. Gravel Base Course
1. In accordance with SECTION 02500.

2.02 SOURCE QUALITY CONTROL

A. Test, Inspection
   1. Engineer may elect to sample material supplied at the source.
   2. Assist the Engineer and/or personnel from the designated testing laboratory in obtaining samples.

PART 3 EXECUTION

3.01 INSTALLATION

A. Crushed Stone
   1. Spread in layers of uniform thickness not greater than 6 inches.
   2. Compact thoroughly by means of a suitable vibrator or mechanical tamper.

B. Gravel Borrow
   1. Spread in layers of uniform thickness not exceeding 12 inches before compaction and moistened or allowed to dry as directed.
   2. Compact thoroughly by means of suitable power-driven tampers or other power-driven equipment.
   3. Compaction shall conform to 95% of minimum dry density per ASTM D1557.
   4. The percolation rate for the compacted bank-run gravel shall not exceed 5 minutes per inch.

C. Select Borrow
   1. Spread in layers of uniform thickness not exceeding 12 in. (loose lift) before compaction and moistened or allowed to dry.
   2. Compact thoroughly by means of suitable power-driven tampers or other power-driven equipment unless otherwise directed by the Engineer.

3.02 FIELD QUALITY CONTROL

A. Material and compaction testing
   1. In accordance with SECTION 01410.

END OF SECTION
SECTION 02272
GEOTEXTILE MATERIALS

PART 1 GENERAL

1.01 SUMMARY
A. Section Includes
   1. Requirements for installation of geotextile filter fabric in trenches and under riprap.
B. Related Sections
   1. Section 02100 - Site Preparation
   2. Section 02200 – Earthwork
   3. Section 02215 – Aggregate Materials

1.02 REFERENCES
A. American Society for Testing and Materials (ASTM)
   2. D4355, Test Method for Deterioration of Geotextiles From Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
   3. D4491, Test Method for Water Permeability of Geotextiles by Permittivity
   4. D4533, Test Method for Trapezoid Tearing Strength of Geotextiles
   5. D4632, Test Method for Grab Breaking Load and Elongation of Geotextiles
   7. D4833, Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products
   8. D5261, Measuring Mass Per Unit Area of Geotextiles.

1.03 QUALITY ASSURANCE
A. General
   1. Producer of fabric to maintain competent laboratory at point of manufacture to insure quality control in accordance with ASTM testing procedures.
   2. Laboratory to maintain records of quality control results.

1.04 SUBMITTALS
A. Shop Drawings
   1. Submit in accordance with SECTION 01300
   2. Include manufacturer’s recommended method of joining of adjacent fabric panels.
B. Certificate of Conformance
1. Upon each shipment/delivery of product to the work site, furnish mill certificate(s) from the company manufacturing the fabric attesting that the fabric meets the chemical, physical, manufacturing and performance requirements specified. Fabric will be rejected if it is found to have defects, rips, flaws, deterioration or other damage.

1.05 DELIVERY, STORAGE AND HANDLING

A. Provide fabric in rolls wrapped with a heavy-duty protective covering to protect fabric from, mud, dirt, dust, debris and other deleterious sources until it is installed. Label each roll of fabric with number or symbol to identify production run.

B. Do not expose fabric to ultraviolet radiation (sunlight) for more than 20 days total in period of time following manufacture until fabric is installed and covered.

C. If Engineer determines material is damaged in any way or has excessive sunlight exposure, the Contractor shall immediately make all repairs and replacements as directed by the Engineer, at no additional cost to the Owner.

1.06 SCHEDULING

A. Schedule Work so that the covering of the fabric with a layer of the cover material is accomplished immediately after inspection and approval of the placed fabric by the Engineer. Failure to comply with this requirement shall require replacement of the fabric.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURER/MATERIAL

A. The geotextile fabric shall be nonwoven polypropylene designated as MIRAFI 140N as manufactured by US Fabrics, Cincinnati, Ohio; or acceptable equivalent and shall meet the following minimum requirements:

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<thead>
<tr>
<th>Property (Unit)</th>
<th>Unit</th>
<th>Test Method</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
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<tr>
<td>CBR Puncture Strength</td>
<td>lbs</td>
<td>ASTM D6241</td>
<td>310</td>
</tr>
<tr>
<td>Trapezoid Tear Strength</td>
<td>lbs</td>
<td>ASTM D4533</td>
<td>50</td>
</tr>
<tr>
<td>Apparent Opening Size (AOS)</td>
<td>US Std.</td>
<td>ASTM D4751</td>
<td>70 (0.21)</td>
</tr>
<tr>
<td>Permittivity</td>
<td>sec⁻¹</td>
<td>ASTM D4491</td>
<td>1.7</td>
</tr>
<tr>
<td>Permeability</td>
<td>cm/sec</td>
<td>ASTM D4491</td>
<td>0.22</td>
</tr>
<tr>
<td>Flow Rate</td>
<td>gal/min/sf</td>
<td>ASTM D4491</td>
<td>135</td>
</tr>
<tr>
<td>Ultraviolet Resistance</td>
<td>%</td>
<td>ASTM D4355</td>
<td>70</td>
</tr>
</tbody>
</table>

(strength retained at 500 hrs)
B. To keep the number of overlay joints to a minimum, fabric shall be provided in sections not less than fifteen (15) feet in width unless otherwise approved by the Engineer prior to delivery to the site.

PART 3 EXECUTION

3.01 SUBGRADE PREPARATION

A. For Riprap
   1. Prepared areas to receive geotextile in accordance with SECTION 02100 and SECTION 02200
   2. Clear subgrade of all sharp objects, large stones, roots, debris, or any other foreign materials that may contribute to puncturing, shearing, rupturing or tearing of the geotextile.
   3. Grade area as smooth as possible and compact in accordance with SECTION 02200, with a vibratory roller or other method approved by the Engineer.
   4. Inspect subgrade and repair all unstable areas or soft spots with the installation of gravel and recompact prior to the placement of geotextile.

3.02 FABRIC INSTALLATION

A. For Riprap
   1. Place at the locations shown on the Contract Drawings.
   2. Unroll directly onto the prepared slope in a continuous manner. Join adjacent sections by overlapping the fabric a minimum of 12-inches. Join end sections by overlapping the fabric a minimum of 2-feet with field-sewn joints or as recommended by the manufacturer.
   3. Place fabric on slopes creating a “shingled” effect in the direction of anticipated water flow.
   4. Lay fabric smooth, maximizing surface contact with the prepared subbase, free of tension, stress, folds, wrinkles, or creases.
   5. Securely anchor fabric sections at the top of the slope as recommended by the manufacturer. Use anchoring pins, nails, staples or other such means to secure fabric to the subbase surface to prevent fabric movement caused by wind uplift, and/or placement of cover material.
   6. Maintain sufficient amount of cover material (minimum depth of 6-inches) to protect fabric during placement of riprap. Dozer buckets or blades, or other heavy or damaging equipment shall not be in direct contact with the fabric.
   7. Minimize the height from which cover material is dumped and/or dropped directly onto the fabric material in order to avoid fabric damage or movement. Equipment used for spreading and compacting the cover material shall be of the type and size to avoid damage or movement to the underlying geotextile fabric.
   8. Spread cover material in the direction of fabric overlap and in a manner that avoids creating undue tension, stress, sagging, buckling and/or other movement of the underlying fabric.

B. Fabric Installation in Trenches
   1. In accordance with manufacturers recommendations
   2. Place fabric in trench prior to placing crushed stone pipe bedding.
   4. Do not permit equipment to travel directly on fabric.
   5. Place fabric in smooth condition to prevent tearing or puncture.
7. Leave slack in fabric to allow for adjustment.

3.03 PROTECTION

A. Protect the work before, during and after installation, and protect the installed work covered by other Sections.

3.04 REPAIR

A. Geotextile fabric damaged during installation shall be repaired by a piece of geotextile material cut, placed and adequately anchored over the damaged area, subject to a 3-foot minimum overlap requirement or as directed by the Engineer.

B. If detrimental movement of the geotextile fabric occurs during any step of the installation, as determined solely by the Engineer, the Contractor shall remove the cover material and/or sections of fabric to the limits deemed necessary and reinstall the fabric.

C. Any fabric damage during its installation or during placement of cover materials shall be replaced by the Contractor at no additional cost to the Owner.

END OF SECTION
SECTION 02276
SILT FENCE WITH HAY BALES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Requirements to perform all operations in connection with the sediment control, as indicated on the Drawings and as herein specified.

1.02 REFERENCES
A. American Society for Testing and Materials (ASTM)
   1. D3786, Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven fabrics
   2. D4355, Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus).

1.03 SUBMITTALS
A. In accordance with SECTION 01300.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURER
A. Silt Fence as manufactured by Amoco Fabrics and Fibers, Austell, GA, Propex Operating Co, Chattanooga, TN or acceptable equivalent.

2.02 MATERIALS
A. Silt Fence
   1. The silt fence shall be comprised of a sediment control fabric and reinforced netting stitched together with heavy duty thread top and bottom, stapled to hardwood posts.
   2. Hardwood posts shall be 1 1/2-inch x 1 1/2-inch nominal, minimum, x 4.0 feet long, spaced a maximum 8.0 feet apart with lower ends tapered to facilitate driving into compacted soil.
      a. Provide larger posts to facilitate driving if required.
   3. A 6-inch flap at the bottom of the fence shall be used to toe in the sediment control barrier to prevent silt migration under the barrier.
   4. Each section of fence shall be supplied with a coupling to attach adjoining sections.
5. Silt fence shall conform to the following test requirements:

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grab Tensile</td>
<td>ASTM D4632</td>
<td>120 lbs.</td>
</tr>
<tr>
<td>Grab Elongation</td>
<td>ASTM D4632</td>
<td>15 %</td>
</tr>
<tr>
<td>Trapezoid Tear Strength</td>
<td>ASTM D4533</td>
<td>60 lbs.</td>
</tr>
<tr>
<td>Apparent Opening Size (AOS)</td>
<td>ASTM D4751</td>
<td>US Std. Sieve 30</td>
</tr>
<tr>
<td>Ultraviolet Resistance</td>
<td>ASTM D4355</td>
<td>70 % @ 500 hrs</td>
</tr>
</tbody>
</table>

6. Roll Width: 3.0 feet.
7. Roll Length: 100.0 feet.

B. Hay Bales

1. Shall be machine baled clean salt hay or straw of oats, wheat, barley, or rye, free from seed of noxious weeds, using standard baling wire or string.
2. Post shall be wooden, 1 1/2-inch x 1 1/2-inch nominal, minimum x 3.0 feet long, with lower ends tapered to facilitate driving into compacted soil.
   a. Provide larger posts to facilitate driving if required.

PART 3 EXECUTION

3.01 INSTALLATION

A. Silt fence and hay bales shall be installed prior to any grubbing or earth excavation.
B. Install silt fence in accordance with manufacturers written recommendations. Excavated soils shall be thoroughly compacted back into trench after installation of erosion control devices.
C. Install hay bales “tight” against silt fence.
D. Anchor hay bales with 2 stakes per bale.
E. Install silt fence and hay bales at locations shown on the Contract Drawings or as directed by the Engineer.

3.02 MAINTENANCE

A. Maintain fence throughout the duration of the project.
B. Remove sediments when depths accumulate to 50% of the depth of the fence height, or as necessary.

3.03 REMOVAL AT PROJECT COMPLETION

A. Remove all sediment collected by the silt fence, remove the silt fence, and restore the area to pre-construction condition to the satisfaction of the Engineer.

END OF SECTION
SECTION 02500

PAVEMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements for construction of all temporary and permanent pavement on paved areas affected or damaged by the Contractor's operations, whether inside or outside the normal trench limits, as indicated on the Drawings and as herein specified.

B. Related Sections

1. Section 02200 - Earth Excavation, Backfill, Fill and Grading

1.02 REFERENCES

A. This specification makes reference to the requirements of additional specifications as listed. The Contractor shall obtain and familiarize himself with all requirements referenced by this specification prior to preparation and installation of any pavements.

1. The Massachusetts Department of Transportation, Highway Division, Standard Specifications for Highways and Bridges, dated 1988, together with all errata addenda additional revisions, and supplemental specifications, all of which are hereinafter referred to as the MassDOT Standard Specifications.

1.03 PAVEMENT SCHEDULE

A. The Contractor's attention is directed to the various pavements required under this contract, and their locations as detailed below.

B. All pavement thickness specified in this specification shall be of the thickness required after compaction.

1. Location: Billings Road, Washington Street, Southern Artery
   Type: Flexible – 6”
   Requirements: 16” Dense Graded/Gravel Sub-base Course
                      4” Bituminous Base
                      2” Bituminous Surface

PART 2 PRODUCTS

2.01 MATERIALS

A. Asphalt Tack

1. Tack coat shall consist of emulsified asphalt, grade RS-1 or cutback asphalt, conforming to the requirements of the MassDOT Standard Specification Section M3.11.06.
B. Bituminous Base
   1. Bituminous Base shall conform to the requirements of the MassDOT Standard Specification Section 420 and M3.11.00 for Base Course.

C. Bituminous Binder Trench Width (Permanent Pavement)
   1. Bituminous Binder Course shall conform to the requirements of the MassDOT Standard Specification Section 420 and M3.11.00 for Binder Course.

D. Bituminous Surface, Trench Width (Permanent Pavement)
   1. Bituminous Surface Course shall conform to the requirements of the MassDOT Standard Specification Section 460 and M3.11.00 for surface course Class I-1.

E. Bituminous Surface, Curb to Curb
   1. Bituminous Surface Course shall conform to the requirements of the MassDOT Standard Specification Section 460 and M3.11.00 for surface course Class I-1.

F. Reinforced Concrete Base
   1. Concrete Base shall conform to the requirements of the MassDOT Standard Specification, Section 430.

G. Bituminous Binder Trench Width (Temporary Pavement)
   1. Temporary Pavement shall be Binder Course conforming to the requirements of the MassDOT Standard Specification Section 420 and M3.11.00 for Binder Course.

H. Dense-Graded Crushed Stone Sub-base Course (Temporary and Permanent)
   1. The dense graded crushed stone sub-base course shall consist of coarse aggregates of crushed stone or gravel and fine aggregates of natural sand or stone screenings. Uniformly pre-mixed with a predetermined quantity of water and placed on the sub-base in close conformity with the lines and grades shown on the Contract Documents or established by the Engineer.
   2. Coarse aggregate shall consist of hard, durable particles of fragments of stone. Materials that break up when alternately frozen and thawed or wetted and dried shall not be used.
   3. Coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test (AASTO-T-96) of not more than 45.
   4. Fine aggregate shall consist of natural or processed sand.
   5. The composite material shall be free from clay, loam or other cohesive soil, and shall conform to the following grading requirements:

<table>
<thead>
<tr>
<th>Sieve Designation</th>
<th>Percentage by Weight Passing Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mesh Sieves</td>
<td></td>
</tr>
<tr>
<td>2 in.</td>
<td>100</td>
</tr>
<tr>
<td>1-1/2 in.</td>
<td>70-100</td>
</tr>
<tr>
<td>3/4 in.</td>
<td>50-85</td>
</tr>
<tr>
<td>No. 4</td>
<td>30-55</td>
</tr>
<tr>
<td>No. 50</td>
<td>8-24</td>
</tr>
<tr>
<td>No. 200</td>
<td>3-10</td>
</tr>
</tbody>
</table>
6. Sampling and testing shall be in accordance with the following standard AASHTO methods:

<table>
<thead>
<tr>
<th>Sieve Analysis</th>
<th>T27</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passing No. 200 Sieve</td>
<td>T11</td>
</tr>
</tbody>
</table>

7. The dense-graded crushed stone sub-base course shall be spread and compacted in layers not to exceed 4 inches in compacted depth, to the same tolerances specified below for the gravel sub-base.

8. The dense-graded crushed stone sub-base course material shall meet the same requirements as specified in MassDOT Specification M2.01.7 except as noted above.

I. Gravel Sub-Base Course

1. The gravel sub-base course shall consist of Gravel Borrow Type b, (3-inches largest dimension) as specified in MassDOT Standard Specification Section M1.03.0

2. The gravel sub-base shall be spread and compacted in one layer, 8 inches in depth compacted measurement, to not less than 95 percent of the maximum dry density of the material, as determined by the Standard AASHTO Test Designation T99 compaction test Method C within 5% of optimum moisture content as determined by the Engineer. If the material retained on the #4 sieve is 50% or more of the total sample, this test shall not apply and the material shall be compacted to the satisfaction of the Engineer. The specific density of the Gravel Sub-base shall be maintained by determining the number of passes of a roller required to produce a constant and uniform density, after conducting a series of tests either using the sand/volume or the nuclear density-testing device.

3. Any stone with a dimension greater than 3 inches shall be removed from the sub-base before the gravel is compacted. Compaction shall continue until the surface is even and true to the proposed lines and grades within a tolerance of ½-inch above or below the required cross sectional elevations and to a maximum irregularity not exceeding ½ inch under a 10 foot line longitudinally. Any specific area a gravel sub-base which, after being rolled, does not form a satisfactory, solid, stable foundation shall be removed, replaced and recompacted by the Contractor without additional compensation.

2.02 SOURCE QUALITY CONTROL

A. The paving plant used by the Contractor for preparation of bituminous paving materials shall be acceptable to the Engineer who shall have the right to inspect the plant and the making of the material as specified in MassDOT Specification M2.01.7 except as noted above.

PART 3 EXECUTION

3.01 PREPARATION

A. Prior to placing pavement, all backfill shall have been properly compacted as specified under Section 02200 to eliminate settling of backfill. No pavement shall be placed over poorly compacted backfill. Backfill and gravel base course shall be compacted, brought to the proper elevation, and dressed so that new pavement construction shall be at the required grade. The Contractor shall maintain the surfaces of all excavated and disturbed areas until the pavement is placed. If there is a time lapse of more than 24 hours between completion of preparation of
subgrade or placing of gravel base course and placing of paving, or if subgrade or gravel base course has been eroded or disturbed by traffic, the subgrade or gravel base course shall be restored before placing pavement.

B. When installing permanent pavement on bituminous concrete roadway the edges of existing pavement shall be cut back 12-inches, or more as required, from the trench excavation wall or damaged area to sound undamaged material, straightened, cleaned, and painted with an accepted asphalt emulsion to ensure a satisfactory bond between it and the newly placed surface courses. Existing surface courses shall be stripped from the bituminous concrete base course for at least a 6-inch width and trimmed square and straight so that new permanent surfacing shall be placed on undisturbed bituminous concrete base course. Existing pavement shall be swept clean prior to placing any asphalt emulsion over it. Existing pavement that will be under new pavement shall be painted with asphalt emulsion to ensure a satisfactory bond.

C. Before permanent pavement is installed, the base shall be brought to the proper grade, and temporary pavement and excess gravel base shall be removed.

D. All manhole covers, catch basin grates, valve and meter boxes, curbs, walks, walls and fences shall be adequately protected and left in a clean condition. Where required, the grades of manhole covers, catch basin grates, valve boxes, and other similar items shall be adjusted to conform to the finished pavement grade.

E. The Contractor shall remove and acceptably dispose of all surplus and unsuitable material.

3.02 INSTALLATION

A. General

1. Unless indicated otherwise, all permanent bituminous pavement shall be installed in two courses or more. Bituminous base courses shall be carefully spread and raked to a uniform surface and thoroughly rolled before application of the top course.

2. All top courses of permanent paving shall be applied with acceptable mechanical spreaders in widths of at least 9 feet.

3. The rolling for all bituminous and gravel base courses shall conform to the standards listed in the appropriate Subsection of the Standard Specification.

4. Pavement shall be placed so that the entire roadway or paved area shall have a true and uniform surface, and the pavement shall conform to the proper grade and cross section with a smooth transition to existing pavement.

B. Gravel Base Course

1. The base course shall be placed to such depth that the furnished compacted base course is the depth as indicated on the Contract Drawings and specified herein.

2. The top of the base course shall be below the furnish grade a distance required to accommodate the compacted pavement material as indicated on the Contract Drawings and specified herein.

3. The base course as herein specified shall be 18-inches thick for flexible pavement and 6-inches thick for rigid pavement.
C. Temporary Pavement

1. Temporary pavement will be installed, at a minimum, before holidays, unless otherwise directed.
2. Temporary pavement shall be placed over all trenches in paved areas where directed by the Engineer.
3. The Contractor, upon completing the backfilling and compaction of the trenches in the streets and the placing of the gravel base courses, shall be required to construct temporary pavement unless otherwise directed by the Engineer.
4. Temporary Pavement in Town or City roads shall be placed in one course and shall consist of 2-inch compacted thickness of hot bituminous mix, on a 12-inch compacted thickness gravel base as directed by the Engineer.
5. Temporary Pavement in State roads shall be placed in one course and shall consist of 3-inch compacted thickness of hot bituminous mix, on a 18-inch compacted thickness gravel base as directed by the Engineer.
6. The Contractor shall maintain temporary pavement in good repair and flush with the existing pavement at all times until the permanent pavement is placed.
7. The temporary pavement shall not be removed until 60 days after installation or until such time that the Engineer authorizes the placement of permanent pavement at an earlier time.

D. Bituminous Base:

1. Bituminous Base shall be used in city streets and parking areas as listed in Article 1.03 of this specification.
2. Bituminous Base shall be placed to the thickness as indicated in Article 1.03 of this Specification and installed in accordance with the requirements of the MassDOT Standard Specification and as detailed in the Contract Drawings.
3. Prior to placing bituminous base, all temporary pavement and sufficient gravel base course shall be removed, to proper depths as detailed in the Contract Drawings.

E. Reinforced Concrete Base:

1. Reinforced Concrete Base shall be used in the streets as listed in Article 1.03 of this specification.
2. Reinforced Concrete Base shall be 8-inch thick and installed in accordance with the requirements of the MassDOT Standard Specification.
3. Prior to placing reinforced concrete base, all temporary pavement and sufficient gravel base course shall be removed, to proper depths as detailed in the Contract Drawings.

F. Bituminous Binder

1. Bituminous Binder shall be used in the streets as listed in Article 1.03 of this specification.
2. Bituminous Binder shall be placed to the thickness as indicated in Article 1.03 of this Specification and installed in accordance with the requirements of the MassDOT Standard Specification and as detailed in the Contract Drawings.

G. Bituminous Surface

1. Bituminous Surface shall be used in the streets as listed in Article 1.03 of this specification.
2. Bituminous Surface shall be placed to the thickness as indicated in Article 1.03 of this Specification and installed in accordance with the requirements of the MassDOT Standard Specification and as detailed in the Contract Drawings.

H. Sidewalks, Driveways, Parking Lots and Curbing

1. Sidewalks, driveways, parking lots and curbing that are removed or damaged by the Contractor's operations shall be restored to a condition at least equal to that in which they are found immediately prior to the start of operations. Materials and methods used for such restoration shall be in conformance with the requirements of the MassDOT Standard Specification.

2. Where the trench location is in a sidewalk, the entire width of the sidewalk shall be replaced with new material. Side forms shall be set so as to obtain and preserve a straight edge along both sides of the walk.

3. Where trench is in a driveway, the driveway shall be repaved across its entire width with even edges.

4. Parking lots shall be repaved in accordance with Article 3.01 of this section.

5. Gravel base course under sidewalks and driveways shall not be less than 12-inches.

I. Surface Maintenance

1. During the guarantee period, the Contractor shall maintain the bituminous surface and shall promptly make good all defects such as cracks, depressions, and holes that may occur. At all times, the surfacing shall be kept in a safe and satisfactory condition for traffic. If defects occur in surfacing constructed by the Contractor, the Contractor shall remove all bituminous concrete and base course as is necessary to properly correct the defect. After removing bituminous concrete and base course, the Contractor shall correct the cause of the defect and replace the base course and bituminous concrete in accordance with these specifications.

END OF SECTION
SECTION 02550

REFLECTORIZED PAVEMENT MARKINGS

PART 1   GENERAL

1.01   SECTION INCLUDES

A. Requirements to furnish and install,
   1. Reflectorized white and yellow line markings (thermoplastic),
   2. Reflectorized pavement markings (paint),
   3. Reflective pavement markings (inlay)

1.02   RELATED SECTIONS

A. Section 02500 - Pavement.

1.03   REFERENCES

A. This specification makes reference to the requirements of additional specifications as listed. The Contractor shall obtain and familiarize himself with all requirements referenced by this specification prior to preparation and installation of any reflectorized pavement markings.

   1. The Commonwealth of Massachusetts, Massachusetts Highway Department, Standard Specifications for Highways and Bridges, dated 1988, together with all errata addenda additional revisions, and supplemental specifications, all of which are hereinafter referred to as the MassDOT Standard Specifications.

1.04   SUBMITTALS

A. In accordance with Section 01300

PART 2   PRODUCTS

2.01   MATERIALS

A. For newly paved streets,

   1. Materials for reflectorized white lines (thermoplastic) shall conform to the requirements of Sub Section M7.01.03 of the MassDOT Standard Specifications.

   2. Materials for reflectorized yellow lines (thermoplastic) shall conform to the requirements of Sub Section M7.01.04 of the MassDOT Standard Specifications.

   3. Material for crosswalks and stop bars to be 3M “Stamark” Brand Pliant Polymer Pavement Markings (Inlay)

      a. Series 5730: 12-inch White line
4. Material for precut symbols and legends to be 3M “Stamark” Brand Pliant Polymer Pavement Markings (Inlay)
   a. Series SMS-900

B. For existing pavement and bituminous patch work on existing streets with painted pavement markings,
   1. Material and methods of installing painted reflectorized white lines shall conform to the requirements of Sub Section M7.01.05 of the MassDOT Standard Specifications.
   2. Material for crosswalks and stop bars shall conform to the requirements of Sub Section M7.01.05 of the MassDOT Standard Specifications.

PART 3 EXECUTION

3.01 INSTALLATION
   A. Installation of reflectorized markings shall be in accordance with Section 860 of the MHD Standard Specification.

   B. Reflectorized markings shall be installed only after permanent pavement has been installed in accordance with Specification Section 02500 and approved by the Engineer.

   C. All pavement markings shall be in accordance with Manual on Uniform Traffic Control Devices

   D. The contractor shall notify the Engineer 48 hours in advance of installation of pavement marking.

   E. The contractor shall furnish adequate protection to freshly completed markings to keep traffic off of them until thoroughly dry.

   F. Pavement markings shall be installed on temporary pavement at the direction of the Owner.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements to furnish, lay, joint, and test ductile-iron pressure pipe, fittings (including special castings), and appurtenant materials and equipment indicated on the Drawings and specified in this Section.

1.02 REFERENCES

A. American Water Works Association (AWWA)/American National Standards Institute (ANSI)
   2. C105/A21.5, Polyethylene Encasement for Ductile Iron Pipe Systems
   7. C153/A21.53, Ductile-Iron Compact Fittings, 3 inches through 64 inches for Water Service
   8. C219, Bolted, Sleeve-Type Couplings for Plain-End Pipe
   9. C600, Installation of Ductile-Iron Water Mains and Their Appurtenances
   10. C651, Disinfecting Water Mains

B. American Society of Testing and Materials (ASTM)

1.03 SUBMITTALS

A. In accordance with SECTION 01300 submit the following:

B. Shop Drawings
   1. Piping layouts in full detail.
   2. Location and type of backup block or device to prevent separation.
   3. Schedules of all pipe, fittings, special castings, couplings, expansion joints, restrained joints and other appurtenances.
   4. Detailed disinfection plan consistent with AWWA C651.

C. Certificates
   1. Sworn certificates of shop tests showing compliance with appropriate standard.

D. Manufacturer’s Literature
1. Catalog cuts of joints, couplings, harnesses, expansion joints, restrained joints gaskets, fasteners and other accessories.
2. Brochures and technical data of coatings and lining’s and proposed method of application.

1.04 QUALITY ASSURANCE

A. Pipe and fittings to be inspected and tested at the foundry as required according to ANSI Standards.

B. Owner reserves right to inspect and/or test by independent service at manufacturer’s plant or elsewhere at his own expense.

C. Owner reserves right to perform visual and hammer test prior to installation.

PART 2 PRODUCTS

2.01 PIPE

A. Ductile-Iron Pipe
   1. Designed in accordance with AWWA/ANSI C150/ A21.50.
      a. Ductile iron pipe used for water mains shall be cement lined Pressure Class 350 push-on or mechanical joint, size as indicated on the Drawings.
      b. For sewer pipeline use class as indicated on the Drawings.
   2. Manufactured in accordance with AWWA/ANSI C151/A21.51.
      a. Unless otherwise indicated or specified, ductile-iron pipe shall be at least thickness Class 52

B. Pipe For Use With Couplings
   1. As specified above except that the ends shall be plain (without bells or beads) cast or machined at right angles to the axis.

2.02 FITTINGS

A. General
   1. Push-on or mechanical-joint fittings shall be all-bell fittings unless otherwise indicated or specified.
   2. In accordance with AWWA/ANSI C110/A21.10.
      a. Fittings 24-inches in diameter and less shall be pressure Class 350.
      b. Fittings 30-inches to 48-inches in diameter shall be at least pressure Class 250.

Or
3. Compact fittings in accordance with AWWA/ANSI C153/A21.53 and shall have a working pressure rating of 350 psi

B. Nuts and Bolts
   1. Ductile Iron or Kor-10 steel T bolts and nuts or approved equal.

C. Nonstandard Fittings
1. Fittings having nonstandard dimensions and cast especially for this project shall be of acceptable design.
2. Manufactured to meet the requirements of these specifications and shall have the same diameter and thickness as standard fittings, but their laying lengths and types of ends shall be determined by their positions in the pipelines and by the particular piping to which they connect.

2.03 ADAPTERS

A. Where it is necessary to joint pipes of different type, furnish and install the necessary adapters unless solid sleeves are indicated on the drawings or permitted. Adapters shall have ends, conforming to the above specifications for the appropriate type of joint, to receive the adjoining pipe. Adapters joining two classes of pipe may be of the lighter class provided that the annular space in bell-and-spigot type joints will be sufficient for proper jointing.

2.04 JOINTS

A. Push-On and Mechanical
   1. In accordance with AWWA/ANSI C111/A21.11.
   2. The plain end of push-on pipe shall be factory machined to a true circle and chamfered to facilitate fitting the gasket.
   3. Push-on and mechanical-joint pipe and fittings shall be provided with sufficient quantities of accessories conforming to AWWA/ANSI C111/A21.11.

B. Restrained
   2. Restraining glands will be required on all fittings.
   3. Pipe, fittings and appurtenances for restrained joints shall be in accordance with AWWA/ANSI C110/A21.10 for full body fittings. Only restraining glands which impart multiple wedging action against the pipe increasing its pressure as the pipe pressure increases will be allowed. Flexibility of the joint shall be maintained after burial. Glands shall be manufactured of ductile iron conforming to ASTM A536. Twist off nuts shall be used to insure proper actuating of the restraining device.
   4. Mechanical joint restraint shall have a working pressure rating of at least 250 psi.
   5. Manufactured by EBAA Iron, Inc., Eastland, Texas, or equal.

C. Gaskets
   1. Gaskets shall be of a composition suitable for exposure to the product which the pipe is intended.

2.05 COUPLINGS

A. Flexible Connections
   1. Where flexible connections in the piping are specified or indicated on the drawings, they shall be obtained by the use of sleeve-type couplings, split couplings, or mechanical-joint pipe and/or fittings as herein specified.

B. Sleeve Type Couplings
   1. Pressure rating at least equal to that of the pipeline in which they are to be installed.
2. For sizes 2 1/2 to 16-inch diameter, up to 250 psi working pressure:
   a. Provide style 442 Long Sleeve, Cast Coupling by Smith Blair, Inc.,
      Texarkana, Texas, or be acceptable equivalent products.
3. For sizes greater than 16-inch diameter, up to 150 psi working pressure:
   a. Provide style 411, with 10-inch long sleeve minimum, Steel Coupling by
      Smith Blair, Inc., Texarkana, Texas, or be acceptable equivalent products.
4. Nuts and Bolts to be galvanized-steel, unless noted otherwise.
5. Provided with gaskets of a composition suitable for exposure to the liquid within the pipe.
6. Provide with fusion bonded epoxy finish.
7. Conform to requirements of AWWA C219.

C. Solid Sleeve Couplings
   1. Solid sleeve couplings and accessories shall be of a pressure rating at least equal to that
      of the pipeline in which they are to be installed.
   2. Couplings shall be ductile iron with gaskets of a composition suitable for exposure to the
      liquid within the pipe.

2.06 ACCESSORIES

A. Tapped Connections
   1. Tapped connections in pipe and fittings shall be made in such manner as to provide a
      watertight joint and adequate strength against pullout. The maximum size of taps in
      pipe or fittings without bosses shall not exceed the listed size in the appropriate table of
      the Appendix to the above-mentioned ANS A21.51 based on 3 full threads for cast iron
      and 2 full threads for ductile iron.
   2. Where the size of the connections exceeds that given above for the pipe in question, a
      boss shall be provided on the pipe barrel, the tap shall be made in the flat part of the
      intersection of the run and branch of a tee or cross, or the connection shall be made by
      means of a tapped tee, branch fitting and tapped plug or reducing flange, or tapping tee
      and tapping valve, all as indicated or permitted by the Engineer.
   3. All drilling and tapping of cast-iron pipe shall be done normal to the longitudinal axis of
      the pipe; fitting shall be drilled and tapped similarly, as appropriate. Drilling and
      tapping shall be done only by skilled mechanics. Tools shall be adapted to the work and
      in good condition so as to produce good, clean-cut threads of the correct size, pitch, and
      taper.

2.07 POLYETHYLENE ENCASEMENT

A. In accordance with AWWA C105.

2.08 FINISHES

A. Lining
   1. Inside of pipe and fittings shall be coated with double thickness cement lining and
      bituminous seal coat conforming to AWWA/ANSI C104/A21.4.

B. Coating
1. Outside of pipe and fittings shall be coated with the standard bituminous coating conforming to AWWA/ANSI C151/A21.51

PART 3   EXECUTION

3.01   HANDLING

A.   Pipe and Fittings

1. Every care shall be taken in handling and laying pipe and fittings to avoid damaging the pipe, scratching or marring machined surfaces, and abrasion of the pipe coatings.
2. Any fitting showing a crack and any pipe or fitting which has received a severe blow that may have caused an incipient fracture, even though no such fracture can be seen, shall be marked as rejected and removed at once from the Work.
3. In any pipe showing a distinct crack and in which it is believed there is no incipient fracture beyond the limits of the visible crack, the cracked portions, if so approved, may be cut off by and at the expense of the Contractor before the pipe is laid so that the pipe used is perfectly sound. The cut shall be made in the sound barrel at a point at least 12-inches form the visible limits of the crack.

3.02   CUTTING

A.   Pipe

1. Except as otherwise approved, all cutting shall be done with a machine having rolling wheel cutters, knives, or saws adapted to the purpose. Hammer and chisel or so-called wheel span cutters shall not be used to cut pipe. All cut ends shall be examined for possible cracks caused by cutting.
2. Cut ends to be used with push-on joints shall be carefully chamfered to prevent cutting the gasket when the pipe is laid or installed.

3.03   INSTALLATION

A.   Pipe and Fittings

1. No defective pipe or fittings shall be laid or placed in the piping, and any piece discovered to be defective after having been laid or placed shall be removed and replaced by a sound and satisfactory piece.
2. Each pipe and fitting shall be cleared of all debris, dirt, etc., before being laid and shall be kept clean until accepted in the complete work.
3. Pipe and fittings shall be laid accurately to the lines and grades indicated on the drawings or required. Care shall be taken to ensure a good alignment both horizontally and vertically.
4. Pipe shall have a firm bearing along its entire length. No pipe or fitting shall be permanently supported on saddles, blocking, or stones.
5. The deflection of alignment at a joint shall not exceed the appropriate permissible deflection as specified in the tabulation titled PIPE DEFLECTION ALLOWANCES.
PIPE DEFLECTION ALLOWANCES

Maximum permissible deflection, in. *

<table>
<thead>
<tr>
<th>Size of pipe, in.</th>
<th>push-on</th>
<th>Mechanical</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>joint</td>
<td>joint</td>
</tr>
<tr>
<td>4</td>
<td>19</td>
<td>31</td>
</tr>
<tr>
<td>6</td>
<td>19</td>
<td>27</td>
</tr>
<tr>
<td>8</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>10</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>12</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>14</td>
<td>11</td>
<td>13-1/2</td>
</tr>
<tr>
<td>16</td>
<td>11</td>
<td>13-1/2</td>
</tr>
<tr>
<td>18</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>20</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>24</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>30</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>36</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>42</td>
<td>7-1/2</td>
<td>7-1/2</td>
</tr>
<tr>
<td>48</td>
<td>7-1/2</td>
<td>7-1/2</td>
</tr>
<tr>
<td>54</td>
<td>5-1/2</td>
<td>--</td>
</tr>
</tbody>
</table>

*Maximum permissible deflection for 18-ft. lengths; maximum permissible deflections for other lengths shall be in proportion of such lengths to 18 ft.

6. When mechanical joint, push-on joint or similar pipe is laid, the bell of the pipe shall be cleaned of excess tar or other obstructions and wiped out before the cleaned and prepared spigot of the next pipe is inserted into it. The new pipe shall be shoved firmly into place until properly seated and held securely until the joint has been completed.

B. Castings

1. Castings to be encased in masonry shall be accurately set with the bolt holes, if any, carefully aligned.
2. Immediately prior to being set, castings shall be thoroughly cleaned of all rust, scale and other foreign material.

C. Temporary Plugs

1. At all times when pipe laying is not actually in progress, the open ends of pipe shall be closed by temporary watertight plugs or by other approved means. If water is in the trench when work is resumed, the plug shall not be removed until all danger of water entering the pipe has passed.

D. Appurtenances

1. Valves, fittings and appurtenances shall be set and jointed as indicated on the drawings.

3.04 ASSEMBLING

A. Push-On Joints
1. Make up by inserting the gasket into the groove of the bell and applying a thin film of special nontoxic gasket lubricant uniformly over the inner surface of the gasket which will be in contact with the spigot end of the pipe.
2. The chamfered end of the plain pipe shall be inserted into the gasket and then forced past it until it seats against the bottom of the socket.

B. Bolted Joints
1. Before the pieces are assembled, rust-preventive coatings shall be removed from machined surfaces.
2. Pipe ends, sockets, sleeves, housings, and gaskets shall be thoroughly cleaned and all burrs and other defects shall be carefully smoothed.

C. Mechanical Joints
1. Surfaces against which the gasket will come in contact shall be thoroughly brushed with a wire brush prior to assembly of the joint. The gasket shall be cleaned. The gasket, bell, and spigot shall be lubricated by being washed with soapy water.
2. The gland and gasket, in that order, shall be slipped over the spigot, and the spigot shall be inserted into the bell until it is correctly seated.
3. The gasket shall then be seated evenly in the bell at all points, centering the spigot, and the gland shall be pressed firmly against the gasket.
4. After all bolts have been inserted and the nuts have been made up finger tight, diametrically opposite nuts shall be progressively and uniformly tightened all around the joint to the proper tension, preferably by means of a torque wrench.
5. The correct range of torque as indicated by a torque wrench and the length wrench (if not a torque wrench) used by an average man to produce such range of torque, shall not exceed the values specified in the tabulation titled TORQUE RANGE VALUES.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>5/8</td>
<td>40-60</td>
<td>8</td>
</tr>
<tr>
<td>4 thru 24</td>
<td>3/4</td>
<td>60-90</td>
<td>10</td>
</tr>
<tr>
<td>30, 36</td>
<td>1</td>
<td>70-100</td>
<td>12</td>
</tr>
<tr>
<td>42, 48</td>
<td>1-1/4</td>
<td>90-120</td>
<td>14</td>
</tr>
</tbody>
</table>

If the effective sealing of the joint is not attained at the maximum torque indicated above, the joint shall be disassembled and thoroughly cleaned, then reassembled. Bolts shall not be over stressed to tighten a leaking joint.

D. Restrained Joints
1. Install in accordance with manufacturers written instructions.
2. Do not exceed manufacturer’s permissible pipe deflection allowance.

E. Sleeve-Type Couplings
1. Prior to the installation of sleeve-type couplings, the pipe ends shall be cleaned thoroughly for a distance of 8-inches.
2. Soapy water may be used as a gasket lubricant.
3. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 6-inches from the end, and the middle ring shall be placed on the already laid pipe end until it is properly centered over the joint.
4. The other pipe end shall be inserted into the middle ring and brought to proper position in relation to the pipe already laid.
5. The gaskets and followers shall then be pressed evenly and firmly into the middle ring flares.
6. After the bolts have been inserted and all nuts have been made up finger tight, diametrically opposite nuts shall be progressively and uniformly tightened all around the joint, preferably by use of a torque wrench of the appropriate size and torque for the bolts. The correct torque as indicated by a torque wrench shall not exceed the manufacturers recommended values.
7. After assembly and inspection and before being backfield, all exterior surfaces of buried sleeve-type couplings, including the middle and follower rings, bolts, and nuts, shall be thoroughly coated with an approved heavy-bodied bituminous mastic. Care shall be taken and appropriate devices used to ensure that the undersides, as well as the more readily accessible parts, are well coated.

3.05 POLYETHYLENE ENCASEMENT

A. When required, install in accordance with AWWA C105.

3.06 SOCKET PIPE CLAMPS, TIE RODS AND BRIDLES

A. Where indicated or necessary to prevent joints or sleeve couplings from pulling apart under pressure, suitable pipe clamps, tie rods or bridles shall be provided. Bridles and tie rods shall be at least 3/4 in. diameter except where they replace flange bolts of smaller size, in which case they shall be fitted with a nut on each side of the pair of flanges. The socket clamps, tie rods or bridles shall be coated with an approved bituminous paint after assembly or if necessary, prior to assembly.

3.07 PIPING SUPPORT (THRUST BLOCK)

A. Where necessary, bends, tees, and other fittings in pipelines buried in the ground may be backed up with 3000 psi concrete placed against undisturbed earth where firm support can be obtained. If the soil does not provide firm support, then restraining devices shall be provided.

3.08 CLEANING

A. Prior to the pressure and leakage tests, thoroughly clean piping of all dirt, dust, oil, grease and other foreign material. This work shall be done with care to avoid damage to linings and coatings.

3.09 TESTING

A. Except as otherwise directed, pipelines shall be given combined pressure and leakage tests in sections of approved length.
1. Provide 24 hour notice to Engineer for all testing
2. The Contractor shall make arrangements for procuring water for testing and be responsible for all associated fees.

3. Pressure testing will be conducted by a third party testing company to be paid for by the Contractor.

B. Furnish and install suitable temporary testing plugs or caps; all necessary pressure pumps, pipe connections, meters, gages, relief valves, other necessary equipment; and all labor required.

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

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

E. Unless it has already been done, the section of pipe to be tested shall be filled with water of approved quality, and all air shall be expelled from the pipe. If hydrants or blow offs are not available at high points for releasing air the Contractor shall make the necessary excavations and do the necessary backfilling and make the necessary taps. After completion of the tests, if directed by the Engineer, remove corporations and plug said holes.

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

G. The pressure and leakage test shall consist of first raising the water pressure (based on the elevation of the lowest point of the section under test and corrected to the gage location) to a pressure in pounds per square inch numerically equal to the pressure rating of the pipe but not to exceed 200 psi. Do not apply this pressure to items of equipment known to be incapable of withstanding such pressure.

H. If the Contractor cannot achieve the specified pressure and maintain it for a period of two hour with no additional pumping, the section shall be considered as having failed to pass the test. Allowable leakage over the one hour period shall be calculated per AWWA C-600 as summarized in the following table.

### Hydrostatic Testing Allowance per 1,000 ft. of Pipe
(Loss in U.S. Gallons Following a 2 Hour Test)

<table>
<thead>
<tr>
<th>Nominal Pipe Diameter (psi)</th>
<th>6 in.</th>
<th>8 in.</th>
<th>12 in.</th>
<th>16 in.</th>
<th>24 in.</th>
<th>36 in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>150</td>
<td>1.10</td>
<td>1.48</td>
<td>2.20</td>
<td>2.94</td>
<td>4.42</td>
<td>6.61</td>
</tr>
<tr>
<td>175</td>
<td>1.18</td>
<td>1.60</td>
<td>1.38</td>
<td>3.18</td>
<td>4.76</td>
<td>7.16</td>
</tr>
<tr>
<td>200</td>
<td>1.28</td>
<td>1.70</td>
<td>2.56</td>
<td>3.40</td>
<td>5.10</td>
<td>7.64</td>
</tr>
</tbody>
</table>
I. If the section fails to pass the pressure and leakage test, the Contractor shall do everything necessary to locate, uncover, and repair or replace the defective pipe, fitting, or joint, all at his own expense and without extension of time for completion of the work. Additional tests and repairs shall be made until the section passes the specified test and is considered acceptable by the Engineer.

J. If, in the judgment of the Engineer, it is impracticable to follow the foregoing procedure exactly for any reason, modifications in the procedure may be made as required and approved by the Engineer, but in any event the Contractor shall be fully responsible for the ultimate tightness of the line within the above leakage and pressure requirement.

K. All testing to be witnessed by the Engineer.

3.10 DISINFECTING AND FLUSHING

A. The Contractor shall disinfect the lines carrying potable water.

B. Furnish all equipment and materials necessary to do the work of disinfecting, and shall perform the work in accordance with the procedure outlined in the AWWA Standard C651 except as otherwise specified herein.

C. During the disinfection period, care shall be exercised to prevent contamination of water in existing mains.

D. The dosage shall be such as to produce a chlorine concentration of not less than 10 PPM (mg/l) after a contact time of not less than 24 hours.

E. After treatment, the main shall be flushed with clean water until the residual chlorine content does not exceed 0.2 PPM (mg/l).

F. Before disposing of the water used in disinfecting and flushing water mains thoroughly neutralize it through the application of a reducing agent, as referenced in AWWA C651.

G. Dispose of the water used in disinfecting and flushing in an approved manner.

H. Connection at cut ins shall be swabbed with 50 PPM solution of chlorine at locations when above methods are not possible.

I. Bacteriological sampling and testing shall be done in accordance with AWWA C651 for each main and each branch. Sampling shall be accomplished with sterile bottles treated with sodium thiosulfate, as required by Standard Methods. No hose or fire hydrants shall be used in collection of samples. A corporation stop installed on the main, with a removable copper tube gooseneck assembly, is the recommended method.

J. Testing shall be done by a laboratory approved by the Engineer, in accordance with Standard Methods, and shall show the absence of coliform organisms. A standard plate count may be required at the option of the Engineer.
3.11 CONNECTION TO EXISTING WATER MAINS

A. In general, connection to existing water mains will not be allowed prior to the new water main successfully passing pressure and bacteria tests that can be verified with written confirmation. Any exception to this requirement will be at the sole discretion of the Engineer and/or Owner.

END OF SECTION
PART 1 - GENERAL

1.01 GENERAL

A. Furnish and install valves, gates and miscellaneous piping appurtenances, as indicated on the drawings and as herein specified.

B. The drawings and specifications direct attention to certain features of the equipment, but do not purport to cover all the details of their design. The equipment furnished shall be designed and constructed equal to the high quality equipment manufactured by such firms as are mentioned hereinafter, or as permitted by the Engineer. The Contractor shall furnish and install the equipment complete in all details and ready for operation.

1.02 RELATED SECTIONS

A. Section 02215 - Aggregate Material

B. Section 02200 - Earth Excavation, Backfill, Fill and Grading

C. Section 02618 - Ductile Iron Pipe and Fittings

D. Section 03300 - Cast-in-Place Concrete

1.03 QUALITY ASSURANCE

A. Contractor is responsible for verifying outside diameter of pipe to be tapped.

B. Coatings in contact with water, which is contiguous with any part of municipal water system, are suitable for use in contact with potable water, provided governing authorities approve and harmful chemicals, taste or odor is not imparted to water when cured.

1.04 REFERENCES

A. ANSI B2.4-1966 (R1974), Hose Coupling Screw Threads.

B. ASNI/AWWA C502, Standard for Dry-Barrel Fire Hydrants.

C. AWWA C500, Standard for Gate Valves, 3 in. through 48 in. NPS, for Water and Sewage System.
1.05 SUBMITTALS

A. Submission of manufacturer's specifications, catalog data, descriptive matter, illustrations, diagrams etc.

B. Operating instructions and parts list.

PART 2 - PRODUCTS

2.01 RESILIENT SEAT WEDGE VALVES

A. Manufactured by Mueller Co., Decatur, Ill.; U.S. Pipe Valve & Hydrant, LLC Albertville, Ala.; American Cast Iron Pipe Co., Birmingham, Ala.; or acceptable equivalent.

B. General

1. Gates shall conform to all applicable sections of AWWA C509.

2. Valve bodies shall be manufactured of ductile iron.

3. **Gate valves shall be open right (clockwise).**

4. All valves shall be provided with “O” rings while the valve is under pressure in a fully-opened position.

5. Exterior surfaces of all valves shall be coated with epoxy coated solution, on a rust-free casting, prior to shipment. Valve interiors shall have a two-part thermostat epoxy-protective coating system and meet all requirements of AWWA C550. The epoxy coating shall not impart taste or odors to the water. The coating shall be a product acceptable to the NSF for use in potable water and shall be so listed in the most current NSF summary of approved products (ANSI/NSF Standard 61). The coating shall be applied and cured in strict conformance with the coating manufacturer’s cautions and instructions. The coating shall be applied by the valve manufacturer under controlled factory conditions, and field application is strictly prohibited.

C. Valves shall be designed for working water pressures as follows:

<table>
<thead>
<tr>
<th>Valve Size (Diameter)</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 to 12 inches</td>
<td>250 psi</td>
</tr>
<tr>
<td>14 to 24 inches</td>
<td>200 psi</td>
</tr>
</tbody>
</table>

D. Buried Valves:

1. Buried valves shall be of the inside-screw type with mechanical-joint ends. An operating nut and extension stem shall be in lieu of hand wheel.
2. The Contractor shall provide the gate boxes, steel extension stems or universal-joint operating rods with 2-in. square operating nut at the upper end with coupling connected to the valve stem as required.

2.02 DOUBLE DISC GATE VALVES

A. Manufactured by Mueller Co., Decatur, Ill.; U.S. Pipe Valve & Hydrant, LLC Albertville, Ala.; American Cast Iron Pipe Co., Birmingham, Ala.; or acceptable equivalent.

B. General

1. Gates shall conform to AWWA C500.

2. Bronze gate-rings shall be fitted into grooves of dovetail or similar shape. For other shapes, rings shall be attached with bronze rivets. Operating nuts shall open right (clockwise) and an arrow shall indicate the open direction. Provide steel bolts and bronze nuts for stuffing box follower. O-ring stuffing boxes will be acceptable.

3. Valves shall be capable of being repacked under line pressure.

C. Valves shall be designed for working water pressures as follows:

<table>
<thead>
<tr>
<th>Valve Size (Diameter)</th>
<th>Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 to 12 inches</td>
<td>250 psi</td>
</tr>
<tr>
<td>14 to 24 inches</td>
<td>200 psi</td>
</tr>
</tbody>
</table>

D. Buried Valves:

1. Buried valves shall be of the inside-screw type with mechanical-joint ends. An operating nut and extension stem shall be in lieu of hand wheel.

2. The Contractor shall provide the gate boxes, steel extension stems or universal-joint operating rods with 2-in. square operating nut at the upper end with coupling connected to the valve stem as required.

2.03 TAPPING SLEEVES AND VALVES

A. Manufactured by Mueller Co., Decatur, Ill.; U.S. Pipe Valve & Hydrant, LLC Albertville, Ala.; American Cast Iron Pipe Co., Birmingham, Ala.; or acceptable equivalent.

B. Provisions: Tapping sleeves and valves shall consist of a split cast-iron sleeve tee with mechanical joint ends on the main, a flange end on the branch, and a tapping type gate valve with one flange end and one mechanical joint end. The valve shall conform to
the requirements herein before specified for gate valves and shall be furnished with a 2-in. square operating nut.

2.04 INSERTION VALVES

A. Manufactured by Advanced Valve Technologies, LLC Blue Island, IL. or acceptable equivalent.

B. Provisions: The equipment shall be capable of installation, without shutdown, at one location, of pipe sizes, in the range of 4” to 12” diameters. The valve shall be capable of pressure-tight assembly to exterior of the pipe in which flow is to be stopped at a working pressure not to exceed 250 PSI. The valve assembly shall be designed as to be easily rotated 120 degrees, perpendicular across the top of the pipe, while riding on two (2) separate rubber gaskets, constructed of (EPDM or SBR), by using a perpendicular rotary feed mechanism, driven by a chain. The valve shall be constructed of a two (2) piece, Ductile Iron casting (Top & bottom), to be bolted together, using Ductile Iron bolts with zinc alloy anodes (Corrosion protection), manufactured to the ductile iron specification of ASTM 536 65-45-12. The valve shall meet or exceed AWWA Specification C509 for Resilient Seal Valves suitable for Potable water service.

2.05 LINE STOP

A. Manufactured by Hydra-Stop, LLC Burr Ridge, IL. or acceptable equivalent.

B. Provisions: The equipment shall be capable of installation, without shutdown, at one location, of pipe sizes, in the range of 4” to 12” diameters.

2.06 HYDRANTS

A. For standardization, hydrants shall be Mueller Super Centurion, Model 250 (with or without AquaGrip System) as manufactured by Mueller Co., or Darling B-62-B as manufactured by American Valve & Hydrant, or approved equal.

B. Provisions:

1. Hydrant design shall be in accordance with AWWA C502, be suitable for buried depth as indicated and be of positive automatic drain type to prevent freezing.

2. The hydrant shall have a 5-1/4-in. valve opened by turning the operating unit in the clockwise direction. The hydrant shall have one 4-1/2-in. pumper and two 2-1/2-in. hose connections. The hose and pumper connections shall have National Standard Thread. The operating nuts shall be pentagonal in shape, 1-1/2-in. from point to opposite flat and shall open right (clockwise). The hydrant shall be the hub or mechanical-joint type having a 6-in. pipe connection.

2.07 VALVE BOXES
A. Provisions:

1. Valve boxes shall be adjustable, telescoping, heavy-pattern type with the lower part manufactured of cast iron and the upper part of steel or cast iron. The valve box shall be designed and constructed to prevent direct transmission of traffic loads to the pipe or valve. Boxes shall be adjustable through at least 6 in. vertically without reduction of lap between sections to less than 4 in. inside diameter of boxes for valves at least 4-1/2 in. and at least 3-in. for stops, and lengths as necessary for depths of the valves or stops with which the boxes are to be used. The top of the cover shall be flush with the top of the box rim. A cast arrow and the word open shall be on the cover to indicate direction of turning to open the valve in top of valve covers.

2.08 T-HANDLE OPERATING WRENCHES

A. Provisions: A T-handle operating wrenches shall be provided in the number and lengths required, but not exceeding 8-ft., to permit operation of all valves and stops by operators of average height working in normal positions.

PART 3 - EXECUTION

3.01 VALVES

A. Erect and support valves in respective positions free from distortion and strain on appurtenances during handling and installation. Inspect the material for defects in workmanship and material. Clean out debris and foreign material from valve openings and seats, test-operating mechanisms to check proper functioning, and check nuts and bolts for tightness. Repair, at no additional compensation, valves and other equipment that do not operate easily or are otherwise defective.

B. Valves installed with stems below the horizontal, will not be allowed.

C. Set plumb and support valves adequately in conformance with instructions of manufacturer.

D. Provide valves with extension stems where required for convenience of operation. Provide extension stems for valves installed underground and elsewhere so that the operating wrench does not exceed 8 ft. in length.

3.02 HYDRANTS

A. Set hydrants plumb, and center buried valve and valve box. Tamp earth fill carefully around the valve box to a distance of 4 ft. on all sides of the box, or to undisturbed trench face, if less than 4 ft. Install at least the same depth of cover on hydrant and connecting pipe as on the distributing main. Set the hydrant upon a slab of stone or
concrete not less than 4-in. thick and 14-in. square. Firmly wedge side of hydrant opposite pipe connections against vertical face of trench with concrete thrust block. Place not less than 7 cu. ft. of crushed stone around the base of the hydrant at the location of drain holes. Backfill around hydrants as specified under Section 02200. Clean hydrant and valve interiors of all foreign matter before installation and inspect in opened and closed positions. Hydrants shall be painted in accordance with Town’s color scheme:

a. Barrel: OSHA yellow

b. Bonnet
   i. 16-inch water main: blue
   ii. 12-inch water main: green
   iii. 8-inch water main: grey
   iv. 6-inch water main: orange

3.03 VALVE BOXES

A. Provide a valve box for each buried stop and valve.

3.04 PAINTING

A. Touch-up abraded areas of shop coat with paint of the same type as shop coat, even to the extent of applying entire coat if necessary, and clean deteriorated surfaces before applying touch-up coat.

B. Shop coat exposed ferrous surfaces, not painted, with grease or other suitable protective coating. Uncoated surfaces in contact with potable water shall not be coated.

C. Hydrant paint shall be manufactured by Sherwin Williams, Tnemec Company, Inc., or Minnesota Mining and Manufacturing Co. (3M), or approved equal.

END OF SECTION
PART 1  GENERAL

1.01  SECTION INCLUDES

A. Requirements for furnishing and installing metallic (detectable) and non-metallic (non-detectable) marking tape over buried pipelines and conduits.

1.02  REFERENCES

A. A.P.W.A. - American Public Works Association

1.03  SUBMITTALS

A. Shop Drawings
   1. Submit in accordance with SECTION 01300 - SUBMITTALS

B. Samples
   1. Provide samples of submitted products.

1.04  DESCRIPTION

A. General
   1. Marking tape to be installed over all pipe lines and conduits installed under this Contract.
   2. Marking tape for non-ferrous pipe or conduits to be Detectable, magnetic type.
   3. Marking tape for ferrous pipe or conduits to be Non-detectable, non-magnetic type.
   4. Tape to be 6-inches wide.

PART 2  PRODUCTS

2.01  MANUFACTURERS

A. Underground utility marking tape to be:
   1. Detectable: Magnatec by THOR Enterprises, Inc., Sun Prairie, WI.
   2. Non-detectable: Shieldtec by THOR Enterprises, Inc., Sun Prairie, WI.
   3. Or product deemed equal by the Engineer.

2.02  MATERIALS

A. Detectable Underground Utility marking Tape
   1. Minimum overall thickness: 5.0 mil (0.005”).
   2. Aluminum foil core: 35 gauge (0.00035”) minimum.
   3. Foil visible from both sides of tape.
   4. Protective plastic jacket applied to both sides of foil.
5. Jacket adhesive applied directly to the film and foil.
6. No printing to extend to the edges of the tape.
7. No Dilutants, pigments or contaminants in the adhesive.
8. Adhesive formulated to resist degradation by elements normally found in soil.

B. Non-detectable Underground Utility marking Tape
   1. Minimum overall thickness: 4.0 mil (0.004”).
   2. Polyethylene plastic film: 100% virgin, low density acid and alkali-resistant.
   4. Coloring: color-fast, lead free, organic pigments suitable for direct burial and prolonged exposure to the elements normally found in soil.

C. Marking
   1. Tape to printed with “BURIED UTILITY LINE BELOW”, replacing the word “UTILITY” with the word “WATER”, “SEWER”, “DRAIN”, “ELECTRIC’, “GAS”, or otherwise appropriate, repeating continuously every 30-inches max.

D. Color Code in accordance with A.P.W.A. Standards as follows:
   1. Safety Red
      Electric power and high voltage lines
   2. High Visibility Safety Yellow
      Gas and oil distribution/Transmission
      Dangerous materials/Steam
   3. Safety Alert Orange
      Fiber optic/telephone/CATV
   4. Safety Precaution Blue
      Water and irrigation lines
   5. Safety Green
      Sewer/storm/sanitary systems, non-potable water
   6. Safety Brown
      Force mains and effluent lines
   7. Alert Purple
      Reclaimed and effluent re-use lines

PART 3 EXECUTION

3.01 INSTALLATION

A. Install marking tape directly above the pipe line or conduit tape is to identify, approximately 18-inches below the proposed finished grade.

B. Install marking tape in accordance with manufacturers recommendations.

C. Install marking tape over existing utilities disturbed by the Contractors operation.

END OF SECTION
SECTION 02642
WATER SERVICE CONNECTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for furnishing and installing potable water service connections.

1.02 SUBMITTALS

A. Shop Drawings

1. In accordance with Section 01300, submit manufacturer’s specifications, catalog data, descriptive literature, illustrations, diagrams, etc.

1.03 REFERENCES

A. American National Standards Institute

1. NSF/ANSI 61 – Drinking Water System Components - Health effects

B. American Society for Testing and Materials (ASTM)

1. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings
4. ASTM D2447 - Standard Specification for Polyethylene (PE) Plastic Pipe, Schedules 40 and 80, Based on Outside Diameter.

C. American Water Works Association (ANSI/AWWA)

1. ANSI/AWWA C800, Underground Service Line Valves and Fittings.

PART 2 PRODUCTS

2.01 MATERIALS

A. Fittings and accessories shall conform to the requirements of ANSI/AWWA C800 unless noted otherwise.

1. Corporation Stops shall be CC thread by compression connection.
2. Curb Stops shall be compression connection.
3. Other connection styles as approved by the Engineer.
B. Fittings shall be manufactured by Clow Corporation, Chicago, IL; Mueller Co., Decatur, IL; Red Head Mfg. Co., Boston, MA; or an acceptable equivalent.

1. Brass goods furnished under this specification shall be new and unused.
2. Any metal past of the fitting in contact with the water must be made of Sebiloy II per ASTM B584 (UNS Alloy C89520). Brass alloys not assigned an ASTM/UNS alloy designation are not acceptable. Plated components in contact with the water not made of Sebiloy II are not approved.
3. Metal components that do not contact the water shall comply with the requirements of ASTM B62 or ASTM B584 copper alloy number C83600.
4. All seats/seals must be of an elastomeric material that has verifiable experience in water systems using chloramines for disinfection. Fluoroelastomers such as unfilled Teflon that exhibit poor tear and cut growth characteristics are not approved.
5. All service fitting shall be certified as suitable for contact with drinking water by an ANSI accredited organization in accordance with NSF/ANSI 61.
6. All fittings shall be stamped or embossed with a mark or name indicating that the product is manufactured from the low-lead alloy as specified.

C. Stops shall be ball valve style and have ends as required to suit type of pipe or tubing to be connected, and a combined cap and tee handle.

C. Curb Boxes

1. Buffalo style, 2 ½-inch, cast iron, heavy duty top section, sliding type with flare top and recess cover marked “WATER” and sliding type arched bottom section.
2. Overall length to suit specified depth of cover requirements as approved by the Engineer.

D. Service Piping

1. 4-inch and larger to be Cement Lined Ductile Iron, Class 52.
2. 2-inch or less to be Type “K” Copper in accordance with ASTM B88.

E. Service Saddle

1. Model 317, manufactured by Smith Blair, Inc., Texarkana, TX.

PART 3  EXECUTION

A. Water service and fire service connections shall be installed or replaced as required from the new water main corporation stop to the new curb stop and connected to the existing service. Remove and replace existing curb stop, remove service pipe from old main, tap new main, install new corporation stop, install copper water service and fire service connection between new main and new installed curb stop.

B. Service shall be maintained as continuously as possible, coordinate shut down with property owner.

C. The tapping machine shall be rigidly fastened to the 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-inch 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 with the machine while it is still in place. Stops shall be tightened only sufficiently to be watertight. Care must be exercised not to overtighten.

D. Service tubing shall be installed with care to avoid kinks or sharp bends. Do not allow tubing to contact ledge, rock or sharp stones which could cause damage.

E. Provide at least 6-inches of coarse grained sand or gravel with a maximum particle size of ½-inch adjacent to and above the service pipe. Backfill remainder of trench with approved backfill material.

F. Services shall be flushed before activating to avoid meter clogging.

G. The Engineer must observe all service connections under normal water main pressure prior to backfilling of the service trench to check for leakage.

H. Service connections shall be free from leaks and may be pressure tested through the water main as directed by the Engineer.

I. The curb service boxes shall be set in a true vertical position and if the boxes are within the limits of the roadway or within areas where the plowing of snow will take place, the tops of the boxes shall be set about ½-inch below the top of the finished grade. In locations where these boxes are not likely to be disturbed, the tops shall be set flush with the adjoining ground.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements to relocate existing utilities which conflict with the proposed Work.

1. Relocations by Contractor
   a. The Contractor shall coordinate with the respective utility company to the extent necessary to relocate the conflicting utility with the Contractor’s forces, comply with the Utility Company’s requirements and not cause delays in this Contract.

2. Relocation by the Utility Company
   a. The Contractor shall coordinate with the respective utility company in order schedule the work with the Utilities forces and not cause delays in this Contract.

1.02 SUBMITTALS

A. In accordance with Section 01300 submit utility relocation plans indicating limits and details of the relocation work.

1.03 PROJECT/SITE CONDITIONS

A. Existing conditions

1. The presence of utilities within the streets, roads and right of ways customarily indicate service lines connecting the buildings and structures along the route. Safeguard all utilities and their respective service connections from damage during the performance of the Work.

2. The presence of utility poles indicates overhead wires for electric, telephone and cable TV also exist. Protect all overhead wires, including service lines, from damage caused by equipment used to perform the Work.

3. Existing utilities, as indicated on the Drawings are from the best available information. The accuracy of such is not guaranteed.

B. Relocation of Utilities

1. Relocation of existing utilities will be required when;
   a. Realignment of the proposed Work will have detrimental effects on the proposed Work or existing utility.

C. Support of Utilities

1. Support of existing utilities will be allowed when;
   a. Support in place will not be detrimental to the utility itself.
   b. Support of utility is in accordance with the requirements of the utility in question.
1.04 SCHEDULING

A. Coordination

1. Coordinate all existing utility relocation work with the appropriate utility company.
2. Notify underground utility locating service (Dig Safe, Call Before You Dig, etc.) in accordance with State requirements.
3. Conduct test pits to identify utility locations needed to perform the Work only after coordination with the utility company and in time to prevent delay of the Work.
4. Coordinate with local water authority to operate water valves as required.

PART 2 PRODUCTS

2.01 MATERIALS

A. As required by the utility company, or as specified, or as approved by the Engineer.

B. To be new.

PART 3 EXECUTION

3.01 EXAMINATION

A. After test pit excavations are performed, submit as built information to utility company and the Engineer.

3.02 INSTALLATION

A. In strict accordance with the requirements of the Utility Company responsible for the Work.

3.03 TESTING

A. Perform pressure and leakage testing on water lines relocated and infiltration or exfiltration testing on storm drains and sewers relocated in accordance with local agencies responsible for the utility.

3.04 INSPECTION

A. Allow access to the relocation work for inspections and recording as-built information.

END OF SECTION
PART 1   GENERAL

1.01 SUMMARY

A. Section Includes

1. Requirements to furnish, install, disinfect, maintain and remove temporary potable water bypass pipe, connections, laterals and services required to adequately serve water customers.

2. The work includes excavation and backfilling, constructing ramps and/or burying piping at driveways and other access ways, replacement of temporary and permanent pavement, restoration of public and private property.

B. Related Sections

1. Section 01570 – Traffic Regulations
2. Section 02200 - Earth Excavation, Backfill, Fill and Grading
3. Section 02500 - Pavement
4. Section 02618 - Ductile Iron Pipe and Fittings

1.02 SYSTEM DESCRIPTION

A. Design Requirements

1. Review the Quincy Department of Public Works water plans, available at their office at 55 Sea Street, Quincy, MA, to determine the extent of the by-pass, especially where dead ends and division gates may require bypass piping. No additional payment shall be considered for the extension of bypass to feed services fed from dead ended pipe or pipe where flow is interrupted by a division gate. This may or may not be noted on the plan. In either case the Contractor is responsible for determining the locations of all dead ends and all locations which require bypass piping.

2. Provide coordination with Quincy Department of Public Works and as needed, obtain approval or any necessary permits with Quincy Department of Public Works.

3. The number of temporary hydrants to be installed within the bypass piping system shall be equal to the number of hydrants existing within that system.

4. Provide temporary services for the customers whose permanent service line is:

   a. Out of service due to the main pipe to which it is connected to is being replaced.
   b. Out of service due to the main pipe to which it is connected to is being served only by the main being rehabilitated or replaced, including dead end pipes and pipes ending at division gates.
   c. Out of service for any other reason in connection with work under this contract.
5. The bypass shall not be less than the sizes indicated in these specifications and in any case not less than 2-inch diameter. All temporary hydrants must be feed by either an in service hydrant or a direct connection to an underground water main with **4-inch** temporary bypass piping.

6. Water for the temporary connection shall be from Owner's nearest available hydrants remaining in service.

**B. Performance Requirements**

1. The pipe and appurtenances utilized for temporary connections shall be suitable for potable water transmission and distribution and be capable of withstanding a service pressure of 150 psi.

2. Have readily available sufficient additional quantity of bypass pipe, connections, lateral and service material of suitable sizes to replace or supplement the temporary facilities in the event these prove inadequate in any way.

**1.03 SUBMITTALS**

A. Submit in accordance with Section 01300 – Submittals,

1. Proposed layout plan and operations schedule for installing and removing temporary bypass, connections, services, valves and temporary hydrant locations.

2. Details of the installation, operation, maintenance, testing, disinfection and removal of temporary facilities including bypass, connections, laterals, customer services and customer connections and temporary fire hydrants.

3. List of materials with sizes for temporary bypass, connections and services.

4. Submit and obtain approval from the Engineer, for the temporary by-pass system prior to start of construction.

   a. The Contractor is advised additional review by the local public agency may be required and he should schedule his submittals to avoid any delays in the Work.

5. Contractor’s 24/7 emergency response plan. Plan should include a minimum of three (3) Contractor personnel, qualified to work on municipal water distribution systems, and skilled in operation, maintenance and repair of the temporary water bypass system in use. Each contact shall be available 24 hours per day/ 7 days per week, and able to respond to emergency repair calls within a maximum of 2 hours.

**1.04 QUALITY ASSURANCE**

A. The Engineer's permission will be required for bypass pipelines, connections, services, and laterals to be laid across streets.

B. The Engineer's permission will be required to remove permanent customer services, laterals and water mains from normal services and to return these to normal service.

C. Safety
1. The proposed temporary connections shall be capable of preventing contamination of contiguous potable water distribution system and services.
2. Coordinate and cooperate with the Owner's water utility and fire department to maintain water distribution and fire protection capability.
3. Ensure that all precautions have been taken for public safety considerations.
4. The Contractor's attention is directed to requirements within the Specifications regarding water supply for Contractor's operations.
5. The Contractor's attention is directed to requirements of Section 01570 regarding traffic control.

PART 2  PRODUCTS

2.01  MATERIALS

A. All pipes, fittings, hoses, connections, and valves suitable for potable water services shall be capable of supplying a service pressure of a minimum of 150 psi and have prior approval of the Engineer.

1. All materials must meet NSF/ANSI 61 and NSF/ANSI 372.

2. PVC bypass piping will not be accepted.

PART 3  EXECUTION

3.01  EXAMINATION

A. Fire Service lines

1. The Contract Drawings provide the size and location of most known fire service pipes on the main streets impacted by the construction. The Contractor shall become familiar with the existing water systems and be responsible for the adequate temporary feed of all fire service lines.
2. Coordinate the connection/disconnection of fire service piping with the buildings fire service contractor.

3.02  PREPARATION

A. Obtain all street opening permits required by the Town/City and/or State if applicable.

B. Notify the Owner, the Owner's water utility and the fire department 48 hours in advance of the time of connecting and disconnecting temporary and permanent facilities so that representatives of the Owner's water utility and fire department may be present at installation or removal of permanent and temporary connections and to permit the Owner to inform customers and users as the Owner deems necessary.
1. Assist in distribution of all customer notices.

3.03 OPERATION OF EXISTING VALVES
A. In accordance with the requirements of Quincy Department of Public Works. Only Quincy Water Department personnel will operate City water gate valves.

3.04 INSTALLATION
A. Furnish, install, maintain and later remove devices necessary to ensure public safety as required and as approved.

B. Excavation and backfill in accordance with Section 02200.

C. Do not operate the Owner's valves, stops and hydrants without the Owner's prior approval.

D. Temporary bypass, connections, laterals, and customer services shall not be installed across streets except as permitted and approved by the Engineer.

E. Water main laterals that are to remain in service shall be connected to the temporary bypass.

F. Work on existing water mains to be in accordance with Section 02618.

G. Bypass piping shall be looped at all times from 2 separate sources with adequate supply.

H. The bypass shall be laid out of the traveled way in a manner as to protect the bypass piping from damage. Whenever possible the temporary bypass shall be laid in the gutter unless otherwise directed by the Engineer.

I. Where bypass has received prior approval to cross streets and street intersections, it must be valved on both sides and should be laid in a trench with temporary pavement placed over it except as permitted otherwise, by the Engineer.

J. Where the bypass crosses driveways and similar access ways to properties, suitable ramp shall be constructed of cold bituminous patch or rubber mats to allow driving and passing over the pipe except where the Engineer requires bypass to be laid in a trench with temporary pavement placed over it. All 6-inch bypass crossing driveways, handicap ramps and similar access ways shall be buried to a minimum depth of 3-inch or as directed by the Engineer.

K. The bypass shall have shut off valves approximately every 400 feet.

L. During freezing, stormy and inclement weather, no work shall be done except work incidental to temporary connections or as directed by the Engineer.

M. Backflow device shall be installed at all feed hydrants.
3.05 HYDRANTS

A. Keep existing fire hydrants in service and make appropriate connections to the bypass or install and maintain temporary fire hydrants adjacent to each existing fire hydrant affected by work until the existing fire hydrants are restored to services. All hydrants temporarily out of service shall be bagged.

B. At locations where hydrants are out of service due to work under this contract, the Contractor shall provide temporary hydrants. A hydrant being used to feed temporary hydrants must be fed by a 4-inch bypass pipe including whip connections.

C. Provide each temporary fire hydrant with individual valve control.

D. The temporary fire hydrants which the bypass is connected to for the temporary water supply shall be flushed satisfactorily prior to making connections to prevent stagnant or discolored water from entering the bypass.

E. The existing hydrants which the bypass is connected to for the temporary water supply shall be flushed satisfactorily prior to making connections to prevent stagnant or discolored water from entering bypass. A separate valved connection from the steamer/pumper nozzle (4-inch) must be supplied for fire service.

3.06 TEMPORARY SERVICE CONNECTIONS

A. Furnish, install, maintain and later remove the temporary service connections from the bypass to each building and service required to be supplied by the water main to be removed from service.

B. Temporary connections shall be laid out of the traveled and access ways where possible.

C. Temporary service connections shall be ramped or installed in a trench where directed and approved by Engineer.

D. Temporary service connections shall be of equal size than the permanent service connections.

E. Install and maintain pressure regulators for temporary services where necessary.

F. The installation and removal of temporary service connections and back cleaning of permanent services shall take place only at times when the work can be observed by the Engineer and other representatives of the Owner.

G. Coordinate and cooperate with the service user and the Owner's water utility and fire department to assure the minimum disturbance to the user's fire protection system and other special and automated use.

H. The temporary service connections shall be made to the user's service line at the sill cock or other convenient and reasonable point or where acceptable to Engineer.
I. Temporary “wye” fittings must be supplied at the sill cock to accommodate use of garden hoses, etc.

3.07 TESTING

A. The temporary connections shall be tested to be shown to be of sufficient pressure and without leaks as demonstrated to the Engineer.

B. If the bypass proves inadequate for the temporary service, the Contractor shall replace or supplement the bypass as appropriate to provide adequate temporary service, including replacement with a larger diameter bypass, as approved by the Engineer.

3.08 DISINFECTION AND FLUSHING PIPELINES

A. Disinfect temporary facilities prior to use to Owner and Engineers satisfaction in accordance with Specification Section 02618, 3.08, Disinfecting and Flushing.

B. Demonstrate that all valves are operational prior to activation and there is an adequate supply of on site replacement material.

3.09 MAINTENANCE

A. Providing labor, materials, and equipment on a twenty-four (24) hour stand-by status to maintain continuous water service to all water customers (connected to the temporary potable water bypass) at no additional cost to the Owner. Any service interruptions, whether caused by defective piping, pipe jointing or other components; physical damage by vehicles; vandalism; frost action; or other unforeseen reasons, shall be immediately corrected and repaired so as to restore the temporary service to all water customers as soon as possible.

   I. Provide the Owner contact information for 24/7 service.

3.10 RESTORATION

A. After water mains are returned to service, the Contractor shall remove all temporary facilities not required for remaining work, and restore and clean up affected areas.

B. Pavement restoration to be in accordance with Section 02500.

END OF SECTION
SECTION 02930

LOAMING AND SEEDING

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Requirements for loaming, fertilizing, seeding, and related work in areas disturbed in the process of performing the Work under this contract.

1.02  SUBMITTALS

A. In accordance with SECTION 01300 submit the following:
   1. Submit with seed, certificates confirming seed mixture, purity, germinating value, and crop year identification.
   2. Submit test samples of loam.

1.03  DELIVERY, STORAGE AND HANDLING

A. Fertilizer:
   1. Delivered mixed as specified in standard size, unopened containers showing weight, analysis, and name of manufacturer.
   2. Store in weather proof place.

B. Seed:
   1. Delivered in original unopened containers with mixture listed.

PART 2  PRODUCTS

2.01  LOAM

A. Fertile, natural topsoil, typical of locality, without admixture of subsoil, refuse or other foreign materials, and obtained from well-drained arable site. Mixture of sand, silt and clay particles in approximately equal proportions. Free of stumps, roots, heavy or stiff clay, stones large than 1 inch in diameter, lumps, coarse sand, noxious weeds, sticks, brush or other deleterious matter.

B. Not less than 4 percent nor more than 20 percent organic matter as determined by loss on ignition of oven-dried samples.

C. Loam test samples dried to constant weight at temperature of 230 degrees. F., plus or minus nine degrees.

D. Use loam, having prior vegetative growth that did not contain toxic amounts of either acid or alkaline elements.
2.02 LIME, FERTILIZER AND SEED

A. Ground agricultural limestone containing not less than 85 percent of total carbonates.

B. Complete fertilizer, at least 50 percent of nitrogen derived from natural organic sources of ureaform and containing following percentages by weight:

<table>
<thead>
<tr>
<th>Nitrogen</th>
<th>Phosphorus</th>
<th>Potash</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>10%</td>
<td>10%</td>
</tr>
</tbody>
</table>

C. Turf grass seed, clean, high in germinating value and latest year's crop mixture as follows:

<table>
<thead>
<tr>
<th>Name</th>
<th>Minimum Proportion by Weight</th>
<th>Percent Purity</th>
<th>Percent Germination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kentucky bluegrass</td>
<td>20%</td>
<td>87%</td>
<td>85%</td>
</tr>
<tr>
<td>Merion Kentucky bluegrass</td>
<td>20%</td>
<td>87%</td>
<td>85%</td>
</tr>
<tr>
<td>Red Chewings fescue</td>
<td>45%</td>
<td>98%</td>
<td>85%</td>
</tr>
<tr>
<td>Italian rye</td>
<td>15%</td>
<td>98%</td>
<td>90%</td>
</tr>
</tbody>
</table>

PART 3 EXECUTION

3.01 GENERAL

A. Supply suitable quantities of water, hose and appurtenances.

3.02 LOAM

A. Spread loam on areas to 6-inch depth after compaction, fine grade and compact.

3.03 LIME, FERTILIZER AND SEEDING

A. Apply lime by mechanical means at rate of 3000 pounds per acre.

B. Apply fertilizer at rate of 1200 pounds per acre.

C. Remove weeds or replace loam and reestablish finish grades, if any delays in seeding lawn areas and weeds grow on surface or loam is washed out prior to sowing seed and without additional compensation. Sow seed at rate of 175 pounds per acre on calm day, by mechanical means. "Hydro-Seeding" not permitted unless otherwise permitted or required by Engineer. Sow one-half of seed in one direction, and other half at right angles to original direction. Rake seed lightly into loam, to depth of not more than 1/4 inch and compact by means of an acceptable lawn roller weighing 100 to 150 pounds per linear foot of width.

D. Water lawn areas adequately at time of sowing and daily thereafter with fine spray, and continue throughout maintenance and protection period.

E. Seed during approximate time periods of April 1 to May 15 and August 15 to October 1, and only when weather and soil conditions are suitable for such work, unless otherwise permitted.
3.04 MAINTENANCE OF SEEDED AREAS

A. Maintain lawn areas and other seed areas at maximum height of 2-1/2 inches by mowing at least three times. Weed thoroughly once and maintained until time of final acceptance. Reseed and refertilize with original mixtures, watering or whatever is necessary to establish over entire area of lawn and other seeded areas a close stand of grasses specified, and reasonably free of weeds and undesirable coarse native grasses.

B. Begin maintenance immediately after each portion of lawn is seeded and continue for minimum of 45 days.

C. Repair or replace all seeded areas which, in judgment of Engineer, have not survived and grown in satisfactory manner, for a period of one year after acceptance.

D. Seeding replacement, same seed mixture as specified and furnished and installed as specified.

3.05 TEMPORARY COVER CROP

A. Sow a temporary cover crop of buckwheat, domestic rye grass or other acceptable seed if there is insufficient time in the planting season to complete seeding, fertilizing, and permanent seeding at the option of Contractor or order of Engineer. Cut and water cover crop as necessary until the beginning of the following planting season, at which time it shall be plowed or harrowed into soil, the areas shall be fertilized and permanent seed crop sown as specified.

END OF SECTION
SECTION 03300
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Requirements for furnishing and installing forms, reinforcing steel, concrete and expansion and/or construction joints

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM)
   1. A185, Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
   2. A615, Specification for deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
   3. C31, Practice for Making and Curing Concrete Test Cylinders in the Field.
   6. C42, Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
  10. C172, Practice for Sampling Freshly Mixed Concrete.
  11. C231, Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
  15. D994, Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)

B. American Concrete Institute (ACI):
   1. ACI 301, Specification for Structural Concrete for Buildings.
   2. ACI 304, Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete.
   3. ACI 305, Recommended Practice for Hot Weather Concreting.
   4. ACI 306, Recommended Practice for Cold Weather Concreting.
   5. ACI 315, Building Code Requirements for Reinforced Concrete.
   6. ACI 347, Guide to Formwork for Concrete.

C. Concrete Reinforcing Steel Institute (CRSI):

1.03 SUBMITTALS

A. Submit Shop Drawings in accordance with SECTION 01300 for the following:
   1. Reinforcing Steel
a. Furnish in detail and completeness that all fabrication and placement at the site can be accomplished without the use of contract drawings for reference.
b. Include number of pieces, sizes, and grade of reinforcing steel, accessories, and any other information required for fabrication and placement.
c. Show joint layout and design
d. Check structural and site drawings for anchor bolts, anchors, inserts, conduits, sleeves, and any other items which are required to be embedded in concrete, and make necessary provisions as required so that reinforcing steel will not interfere with the placement of such embedded items.

2. Concrete mix designs.
3. Grout manufacturer/design mix (if included in this section)
4. Manufacturer’s data for ancillary materials such as joint fillers and sealants, epoxy bonding compound.

1.04 QUALITY ASSURANCE

A. Selection of testing laboratory in accordance with SECTION 01410.

B. Sample and Test Concrete as follows:
   1. Test Specimens: Make, cure and have tested, a minimum of one set of four test specimens from the concrete of each day's pour and for each fifty cubic yards of concrete cast in accordance with ASTM C172, C31 and C39. One cylinder shall be broken after seven days and three cylinders after twenty-eight day.
   2. Slump: A slump test shall be made for each truck load of concrete in accordance with ASTM C143. Slumps greater than design mix limit will be grounds for rejection of the concrete.
   3. Air Content: An air content test shall be made from each day's pour of concrete by the pressure method in accordance with ASTM C231. Air contents above or below the limits specified will be grounds for rejection of the concrete.
   4. In the event the compressive strength of the cylinders, when tested, is below the specified minimum, the Engineer may require test cores of the hardened structure to be taken by the Testing Laboratory in accordance with ASTM C42. If such test indicates that the core specimen is below the required strength, the concrete in question shall be removed and replaced without cost to the Owner. Any other work damaged as a result of this concrete removal shall be replaced with new materials to the satisfaction of the Engineer at no additional cost to the Owner. The cost of coring will be deducted from the contract amount. Where the Testing Laboratory has taken core cylinders and the concrete proves to be satisfactory, core holes shall be filled in a manner satisfactory to the Engineer at no additional cost to the Owner.
   5. The Contractor shall coordinate the date and location of tests with the Engineer before any concrete work is started.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Reinforcing steel.
   1. Transport to the site, store, and cover in a manner which will ensure that no damage shall occur to it from moisture, dirt, grease, or any other cause that might impair bond to concrete or chip protective epoxy coating.
   2. Store on the site at all times, a supply of approved reinforcing steel to ensure that there will be no delay of the work.
   3. Identification of steel shall be maintained after bundles are broken.
PART 2 PRODUCTS

2.01 MATERIALS

A. Portland Cement.
   1. In accordance with ASTM C150, Type II of U.S. manufacture.
   2. Only one brand of cement shall be used on the project.

B. Aggregates.
   1. Fine aggregate, in accordance with ASTM C33, clean and graded from 1/4 inch to fines.
   2. Coarse aggregate, in accordance with ASTM C33, clean and graded from 1/4 inch to maximum sizes hereinafter specified.

C. Air Entraining Agent.
   1. In accordance with ASTM C260.

D. Water Reducing Agent.
   1. In accordance with ASTM C494 Type A.

E. Microsilica Admixture.
   1. Packaged in easily dispersing form.

F. Water.
   1. Clean and potable,
   2. Free of impurities detrimental to concrete.

G. Reinforcing Bars.
   1. New, deformed billet steel bars, in accordance with ASTM A615, Grade 60.

H. Welded Wire Fabric
   1. In accordance with ASTM A185.

I. Accessories.
   1. Reinforcement accessories, consisting of spacers, chairs, ties, and similar items shall be provided as required for spacing, assembling, and supporting reinforcement in place.
   2. All accessories shall be dielectric coated steel or approved plastic accessories, conforming to the applicable requirements of the CRSI Standards.

J. Tie wire.
   1. 16 gauge or heavier black annealed wire.

K. Form Ties and Spreaders.
   1. Standard metal form clamp assemble and plastic cone, of type acting as spreaders and leaving no metal within 1 inch of concrete face.
   2. Provide form tie with water stop for all walls to be in contact with earth or liquid.
   3. Inner tie rod shall be left in concrete when forms are removed.
   4. No wire ties or wood spreaders will be permitted. Use ½" x 1" C.T. plastic cones for sinkages.

L. Form Coatings.
1. Non-grain raising and non-staining type that will not leave residual matter on surface of concrete or adversely affect proper bonding of subsequent application of other material applied to concrete surface.
2. "Nox-Crete Form Coating" as manufactured by Nox-Crete Company, or approved equal.
3. Coatings containing mineral oils or the non-drying ingredients will not be permitted.

M. Grout.
   1. High-strength, non-shrink grout with saltwater resistance.
   2. Five Star Special Grout 120 or equivalent.

2.02 CONCRETE STRENGTHS AND PROPORTIONS

A. Cast-in-place concrete shall have the minimum compressive strength at 28 days as indicated on the Drawings.

B. The exact proportions for the mix, including amounts admixture (if any), and water, shall be determined by the concrete supplier.

C. The proportions of aggregate to cement for any concrete shall be such as to produce a mixture which will work readily into the corners and angles of the forms and around reinforcement with the method of placing employed not he work, but without permitting the materials to segregate or excess free water to collect on the surface.

D. Air-Entrainment: The air content in all concrete shall be maintained at 5 to 7 percent.

2.03 PREMOLDED JOINT FILLER

A. Bituminous Type.
   1. In accordance with ASTM D994 or D1751.

B. Sponge Rubber Type.
   1. Neoprene, closed-cell, expanded in accordance with ASTM D1056, Type 2C5, with a compression deflection, 25 percent deflection (limits), 17 to 24 psi (119 to 168 kPa) minimum.

2.04 POURABLE JOINT FILLERS

A. Filler for Nonpotable Water Structures
   1. Specific Gravity: Greater than 1.0 for cured, in-place filler.
   2. Vertical and Sloped Joints: Furnish gun grade material that will remain as placed in joints and will not run down slope.
   3. Suitable for continuous immersion and exposure to liquid being contained in the structure.

2.05 JOINT SEALANTS

A. In slabs.
   1. In accordance with ASTM C920 for poured 2-component polyurethane sealant.
   2. Sikaflex-2c, as manufactured by Sika Corporation or approved equivalent.

B. In walls.
1. Type II, Class A, compound conforming to Interim Federal Specification TT-S-00227E (3) (COM-NBS) for Sealing Compound; Elastomeric Type, Multi-Component (for Caulking, Sealing, and Glazing in Buildings and Other Structures).
2. Sikaflex-1a, as manufactured by Sika Corporation or approved equivalent.

2.06 EPOXY BONDING COMPOUND

A. The epoxy bonding compound shall be a three-component, solvent-free, moisture-tolerant, epoxy modified, cementitious product specifically formulated as a bonding agent and anti-corrosion coating. The product shall have suitable contact time, fluidity, and application temperature for this type of application.

PART 3 EXECUTION

3.01 FORMWORK

A. Falsework for Forms

1. Build and maintain necessary false work for the forms.

B. Construction of Forms

1. General
   a. Construct in accordance with ACI 347.
   b. Construct of sound material, to the correct shape and dimensions, mortar tight, of sufficient strength, and so braced and tied together that the movement of men, equipment, materials, or placing and vibrating the concrete will not throw them out of line or position.

2. Embedded Items
   a. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, water stops, and other features.
   b. Do not embed wood, other than necessary nailing blocks, in concrete.
   c. Extended complete cooperation to suppliers of embedded items in their installation.
   d. Secure information for embedded items from other trades as required.
   e. Securely anchored embedded items in correct location and alignment prior to placing concrete.

3. Openings for Items Passing Through Concrete
   a. Establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections.
   b. Coordination work of this nature in order that there will be no unnecessary cutting and patching of concrete.
   c. Cutting and repairing of concrete as a result of failure to provide for such openings shall be paid for by the Contractor at no additional expense to the Owner.

C. Removing Forms and False work

1. Forms shall not be removed for at least 72 hours after concrete has been placed.
2. Forms shall not be removed until the concrete has attained sufficient strength to insure stability.
3.02 REINFORCING STEEL

A. General
   1. Place reinforcing steel in accordance with the drawings and approved shop drawings and the applicable requirements of the CRSI, Manual of Practice.
   2. Install reinforcement accurately and secure against movement, particularly under the weight of workmen and the placement of concrete.

B. Reinforcing Steel Supports
   1. Support bars on approved plastic or dielectric-coated metal chairs or spacers, accurately placed and securely fastened to forms or steel reinforcement in place.
   2. Supply additional bars, whether specifically shown on the drawings or not, where necessary to securely fasten reinforcement in place.
   4. Spacing of chairs and accessories shall conform to CRSI, Manual of Standard Practice. Accurately space hoops and stirrups and wire to the reinforcement.
   5. Permit no lose wood inside forms.
   6. Lifting of welded wire fabric into proper position while concrete is being poured rather than supporting fabric on chairs will not be permitted.

C. Placing and Tying
   1. Set in place, space, and rigidly and securely tie or wire with tie wire at all splices and at all crossing points and intersections in the positions shown, or as directed.
   2. Rebending of bars on the job to accommodate the job to accommodate existing conditions will not be permitted without the written approval of the Engineer
   3. Points ends of wire ties away from forms.

D. Spacing
   1. Minimum center to center distance between parallel bars shall be in accordance with the details on the drawings, or, where not shown, the clear spacing shall be 2 times the bar diameter but in no case less than 1½ inches or less than 1½ times the maximum size aggregate.

E. Splices
   1. Maximum 50% of steel spliced occurring within lap length.
   2. Top bars shall be 1.3 times values given in 3.01.D.5.c.
      a. #6 bars and smaller: 50-bar diameter
      b. #7 bars and larger: 60-bar diameter

F. Concrete Covering
   1. In accordance with ACI 315, except where shown otherwise on drawings.

3.03 CONCRETE

A. Mixing of Concrete
   1. All concrete shall be ready-mixed concrete, and shall be mixed and delivered in accordance with ASTM C 94. The batch plant of the concrete producer shall be certified for compliance with the standards established by the National Ready-Mixed Concrete Association.
2. In the event concrete is mixed at a central batching plant, the delivery shall be arranged so that intervals between batches are kept to a minimum, and in any event not more than thirty (30) minutes. Trucks shall be in first class condition and kept in constant rotation during delivery.

3. Concrete shall be placed within 90 minutes after cement has been mixed with aggregate or 45 minutes after addition of water and admixtures.

4. No admixtures, except those mentioned in paragraph 2.1 shall be used. Calcium chloride will not be permitted.

5. Truck delivery slips of all concrete delivered to the job shall indicate the quantity and quality of concrete, additives, date and time of batching and delivery, and the location of placement. Delivery slips shall be forwarded to the Engineer at the end of each pour.

B. Cold Weather Concreting.

1. In accordance with ACI 306.

2. Concrete shall not be mixed or placed when the temperature is below 40 degrees F, or when conditions indicate that the temperature will fall below 40 degrees F within 72 hours unless precautions are taken to protect the concrete.

3. Concrete temperature shall be maintained, when deposited, at not less than 60 degrees F. Reinforcement, forms, and ground which concrete will contact must be completely free of frost.

4. Concrete and formwork must be kept at a temperature of not less than 50 degrees F. for not less than 96 hours after placing.

5. Calcium chloride shall not be used.

C. Hot Weather Concreting.

1. In accordance with ACI 305.

2. The maximum temperature of the concrete, when deposited, shall be 85 degrees F. If the weather causes the placing temperature to exceed 85 degrees F., the mix shall be cooled by methods approved by the Engineer.

3. No concrete shall be deposited when the air temperature is greater than 90 degrees F.

D. Conveying and Placing Concrete.

1. In accordance with ACI 304.

2. Notification: Before placing concrete, forms shall be thoroughly inspected. All chips, dirt, etc., shall be removed, all temporary bracing and cleats taken out, all openings for pipes, etc., properly boxed, all forms properly secured in their correct position and made tight, all reinforcement, anchors, and embedded items secured in their proper places. Concrete which may be on the forms or reinforcement, and which is set and dry, shall be cleaned off, and the forms and steel washed off before proceeding. Remove all foreign matter from forms and excavations.

3. Water shall be removed from place of deposit before concrete is placed unless otherwise permitted by the Engineer. Any flow of water into an excavation shall be diverted through proper side drains into a sump, or shall be removed by other approved methods which will avoid washing away the freshly deposited concrete.

4. Soil on which concrete will be poured shall be thoroughly wetted (except in freezing weather).

5. Anchors and Embedded Items: Anchors, bolts, sleeves, inserts, wood blocking, and any other items to be embedded in concrete shall be accurately secured in position before the concrete is placed. Aluminum shall not be embedded in concrete.

6. Handling and Depositing
a. Before any concrete is placed, notify all whose work is in any way connected with or influenced by the concrete work, and give them reasonable time to complete all portions of their work that must be completed before concrete is deposited.
b. Immediately before concrete is placed, inspect all forms to insure that they are in proper position, sufficiently rigid, thoroughly clean, properly oiled and free from foreign materials, and that all reinforcement is in proper position.
c. Concreting, once started, shall be carried on as a continuous operation until the section of approved size and shape is completed.
d. Concrete shall be conveyed as rapidly as practicable from the mixer to the place of final deposit by methods that prevent the separation or loss of ingredients. It shall be deposited, as nearly as practicable, in its final position to avoid rehandling or flowing.
e. Concrete shall not be dropped freely where reinforcement will cause segregation, nor shall it be dropped freely more than six (6) feet. Concrete shall be deposited to maintain a plastic surface approximately horizontal.
f. Concrete that has partially hardened shall not be deposited in the work.

7. Pumping
a. Concrete may be placed by pumping if first approved in writing by the Engineer for the location proposed.
b. Equipment for pumping shall be of such size and design as to ensure a practically continuous flow of concrete at the delivery end without separation of materials.
c. The concrete mix shall be designed to the same requirements as herein before specified, and may be richer in lubricating components in order to allow proper pumping.
d. Concrete shall not be pumped through aluminum pipes.

8. Vibrating and Compacting
a. All concrete shall be thoroughly consolidated and compacted by suitable means during the operation of placing, and shall be thoroughly worked around reinforcement, embedded items, and into the corners of the forms. All concrete against forms shall be thoroughly spaded. Internal vibrators shall be used under experienced supervision, and shall be kept out of contact with reinforcement and wood forms. Vibrators shall not be used in a manner that forces mortar between individual form members.
b. Vibrators shall be flexible electric type or approved compressed air type, adequately powered and capable of transmitting to the concrete not less than seven thousand (7,000) impulses per minute. Vibration shall be sufficiently intense to cause the concrete to flow or settle readily into place without separation of the ingredients. A sufficient number of vibrators shall be employed so that complete compaction is secured throughout the entire volume of each layer of concrete. At least one (1) vibrator shall be kept in readiness as a spare for emergency use. Vibrators shall be such that the concrete becomes uniformly plastic with their use.
c. Vibration shall be close to the forms but shall not be continued at one spot to the extent that large areas of grout are formed or the heavier aggregates are caused to settle. Care shall be taken to not disturb concrete that has its initial set.
d. Where conditions make compacting difficult, or where the reinforcement is congested, batches of mortar containing the same proportions of cement to sand as used in the concrete shall first be deposited in the forms, to a depth of at least on inch.
e. The responsibility for providing fully filled out, smooth, clean, and properly aligned surfaces free from objectionable pockets shall rest entirely with the Contractor.
3.04 CONSTRUCTION JOINTS

A. Construction joints shall be located a maximum of 40 feet apart. If, for any reason, the contractor feels a change is necessary, he shall prepare a placing plan and submit it to the Engineer for approval.

B. Where a joint is to be made, the surface of the concrete shall be sandblasted or thoroughly picked, thoroughly cleaned, and all laitance removed. In addition to the foregoing, joints shall be thoroughly wetted, but not saturated, and slushed with a coat of grout immediately before the placing of new concrete.

C. Approved keys shall be used at all joints, unless detailed otherwise.

D. Forms shall be retightened before placing of concrete is continued. There shall be an interval of at least 48 hours between adjacent pours.

E. Bonding Concrete at Construction Joints
   1. To new concrete construction joints:
      a. Thoroughly clean and saturate joint with water.
      b. Cover horizontal wall surfaces as specified in this Section, and immediately place concrete.
      c. Limit concrete lift placed immediately on top of bonding compound to 12 inches thick.
      d. Thoroughly vibrate to mix and consolidate bonding compound and concrete together.

F. Bonding new concrete to old concrete:
   1. Mechanically roughen existing concrete surfaces to a clean, rough surface using appropriate mechanical means to remove the existing concrete surface, and provide a minimum roughness profile of ¼-inch.
   2. Saturate surface with water for 24 hours, cover with epoxy bonding compound and place concrete as specified for new concrete.

G. Expansion Joints
   1. Expansion joints shall be located as shown on contract drawings.
   2. The joint shall include a joint filler, a bond breaker and joint sealant and installed as indicated on contract drawings.

H. Joint Sealants.
   1. Prepare surface in accordance with manufacturers directions.
   2. Apply primer as recommended by sealant manufacturer.
   3. Install sealant with the proper tools and methods as directed by the sealant manufacturer.

I. Patching
   1. Immediately after stripping forms, patch minor defects, form-tie holes, honeycombed areas, etc., before concrete is thoroughly dry.
   2. Repair gravel pockets by cutting out to solid surface, form key, and thoroughly wet before placing patching mortar consisting of 1 part cement to 2 parts fine sand; compact into place and neatly finish. Honeycombed areas or gravel pockets which, in the Engineer's opinion are too large and unsatisfactory for mortar patching as described above, shall be cut out to solid surface, keyed, and packed solids with matching concrete to produce firm bond and surface.
3. The Contractor shall do all the cutting as required by himself or other trades. All such work shall be of the minimum size required. No excessive cutting will be permitted, or shall any structural members or reinforcement be cut.

4. The Contractor shall do all patching after work by other trades has been installed, where required, using Portland Cement Mortar 1:2 mix.

J. Protection and Curing

1. Protect concrete from injurious action of the elements and defacement of any nature during construction operations.
2. Keep concrete in a thoroughly moist condition from the time it is placed until it has cured, for at least (7) days.
3. Carefully protect exposed concrete corners from damage.
4. Allow no slabs to become dry at any time until curing operations are complete. In general, slabs shall be cured with non-staining curing paper, hosing or fog spray; vertical surfaces shall be curing with Burlene or fog spray or an approved curing compound.
5. Protect fresh concrete from drying winds, rain, damage, or spoiling. Curing paper shall be lapped 4 inches minimum at joints and sealed with waterproof tape.

K. Concrete Finishes

1. Unexposed Surfaces: All unexposed surfaces shall have any form finish, at the Contractor's option.
2. Wearing Surface Finish: Float the surface by hand using a wooden or magnesium float. Finish with a flexible bristle broom. Permit surface to harden sufficiently to retain the scoring or ridges. Broom transverse to traffic or at right angles to the slope of the slab.
3. Addition of Material: The addition of cement, sand, water, or mortar to slab surfaces while finishing concrete is strictly prohibited.

L. Defective Work

1. The following concrete work shall be considered defective and may be ordered by the Engineer to be removed and replaced at Contractor's expense:
   a. Incorrectly formed.
   b. Not plumb or level.
   c. Not specified strength.
   d. Containing rock pockets, voids, honeycomb, or cold joints.
   e. Containing wood or foreign matter.
   f. Otherwise not in accordance with the intent of the Drawings and Specifications.

END OF SECTION
SECTION 11150
TRAILER MOUNTED MESSAGE SIGN

PART 1 GENERAL

1.01 SUMMARY
A. Section Includes
   1. Requirements for trailer-mounted message sign and associated equipment.

1.02 SYSTEM DESCRIPTION
A. Design Requirements
   1. System shall be Ver-Mac’s Model PCMS-548 or approved equal.

1.03 SUBMITTALS
A. Submit in accordance with Section 01300
   1. Shop Drawings:
      a. Principal dimensions and general overall sizes.
   2. Quality Control Submittals
      a. Manufacturer’s shop test procedure.
      b. Manufacturer’s instructions.
      c. Operation and maintenance manuals.
      d. Complete parts list.

1.04 DELIVERY, STORAGE, AND HANDLING
A. In conformance with SECTION 01600.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   1. Message sign shall be Ver-Mac’s Model PCMS-548 or approved equal.

END OF SECTION