TOWN OF NAHANT, MASSACHUSETTS

TECHNICAL SPECIFICATIONS
FOR

2020 WATER MAIN IMPROVEMENTS

April 2020
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INVITATION TO BID

2020 WATER MAIN IMPROVEMENTS

Sealed bids for 2020 Water Main Improvements, shall be received by mail at the Town Manager’s Office, Town Hall, 334 Nahant Road, Nahant, MA 01908 until 3:00 P.M. local time on May 4, 2020. Bidders have the option to deliver in person but are encouraged to mail their bids. Immediately following the deadline for receipt of bids, bids will be opened and read aloud in the Meeting Room, 2nd Floor of the Town of Nahant, Town Hall. Bidders will not be permitted in the Meeting Room due to current Governor’s orders on public gatherings, however the bid opening will be broadcast electronically for public participation.

The work consists of replacing existing 1-inch water main and installing approximately 1,170 LF of 8-inch C-900 PVC water main and appurtenances on Walton Road and Furbush Road. Bid alternates include installing approximately 180 LF of 8-inch C-900 PVC water main and appurtenances on Mills Terrace, approximately 250 LF of 8-inch C-900 PVC water main and appurtenances on How Road from Little Nahant Road to Hydrant #28, and approximately 260 LF of 8-inch C-900 PVC water main and appurtenances on Howe Road from Hydrant #28 to the end.

The project shall be substantially completed within 138 consecutive calendar days from the date specified in Section 00650 Notice to Proceed, exclusive of final paving.

The Issuing Office for the Bidding Documents is: Town of Nahant, Town Hall, 334 Nahant Road, Nahant, MA 01908. Bidding Documents will be available on April 10, 2020 at 10:00 AM. Prospective Bidders may examine the Bidding Documents online through the Town’s website. Electronic Bidding Documents may be obtained free of charge in PDF format by contacting Sarah Ouadghiri at SOuadghiri@kleinfelder.com and becoming a registered bidder. Hard copies of the Bidding Documents are not available. Only bidders registered with Kleinfelder will receive Addenda.

The date that the Bidding Documents are transmitted via email will be considered the prospective Bidder’s date of receipt of the Bidding Documents. Neither Owner nor Engineer will be responsible for full or partial sets of Bidding Documents, including Addenda if any, obtained from sources other than the email listed above.

Each bid shall be accompanied by a bid security in the amount of five percent of the value of the bid in the form described in the Instructions to Bidders, Section 00100.

A performance bond and payment bond each in the amount of 100 percent of the contract price will be required in the form described in the Instructions to Bidders.

Every bid bond, every performance bond, and every payment bond issued for any construction work in the Commonwealth shall be the bond of a surety company organized pursuant to Section 105 of Chapter 175 or a surety company authorized to do business in the Commonwealth under the provisions of Section 106 of said Chapter 175 and be approved by the U.S. Department of Treasury and acceptable as sureties and reinsurers on federal bonds under title 31 of the United States Code, Sections 9304 to 9308.

No bidder may withdraw his bid within 30 days (Saturdays, Sundays and legal holidays excluded) after the actual date of the opening thereof.
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 27G, and by the Secretary of Labor, under the Provisions of the Code of Federal Regulations, as amended, apply to this project. It is the responsibility of the contractor, 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 this contract.

Each bid shall be accompanied by a reference list as evidence of his/her qualifications to perform the work as bid according to all the requirements of the plans and specifications. (See Section 00301 BID for form.)

Materials and supplies used or incorporated in the performance of this contract are exempt from sales and use tax.

Complete instructions for filing Bids are included in the Instruction to Bidders.

The bidding and award of the Contract shall be in full compliance with Section 39M inclusive of Chapter 30 of the General Laws of the Commonwealth of Massachusetts as last revised.

The Owner reserves the right to waive any informality or to reject any and all bids. A bid which includes, for any item, a unit cost that is abnormally low or high may be rejected as unbalanced. The right is also reserved to accept any bid deemed to be best for the interest of the Town of Nahant, MA.
SECTION 00100

INSTRUCTIONS TO BIDDERS

1. Receipt and Opening of Bids
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3. Ability and Experience of Bidder
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27. Third Party Work

1. RECEIPT AND OPENING OF BIDS

1.1 Sealed Bids for the work of this Contract will be received at the time and place indicated in the Invitation to Bid.

1.2 TOWN OF NAHANT may consider informal any Bid not prepared and submitted in accordance with the provisions hereof.

1.3 Bidders are cautioned that it is the responsibility of each individual bidder to assure that his bid is in the possession of the responsible official or his designated alternate prior to the stated time and at the place of the Bid Opening. Town of Nahant is not responsible for bids delayed by mail and/or delivery services, of any nature.
1.4 If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope and addressed to Town Administrator – Antonio Barletta, 334 Nahant Road, Nahant 01908 and designated as 2020 Water Main Improvements.

2. **DEPOSIT ON DRAWINGS AND DOCUMENTS**

2.1 Upon award of the Contract, the Contractor will be provided with up to three (3) copies of specifications and drawings necessary for execution of the Work.

3. **ABILITY AND EXPERIENCE OF BIDDER**

3.1 No award will be made to any bidder who cannot satisfy the Town of Nahant that he has sufficient ability and experience in this class of work and sufficient capital and plant to enable him to prosecute and complete the Work successfully within the time named. The Town of Nahant's decision or judgment on these matters shall be final, conclusive, and binding.

3.2 The Town of Nahant may make such investigations as it deems necessary, and the Bidder shall furnish to the Town of Nahant, under oath if so required, all such information and data for this purpose as the Town of Nahant may request.

3.3 The apparent low bidder shall demonstrate minimum qualifications including but not limited to:

   A. A resume and references of the bidder’s construction superintendent to be assigned to the work of this Contract demonstrating at least five (5) years successful experience in this class of work.

   B. Project descriptions and references for at least five (5) successfully completed projects of similar work within the past ten (10) years.

   C. For each of the projects listed in Item B, provide the contract value.

3.4 Apparent low bidder shall submit the above information to the Engineer for review within 5 working days after opening of bids. Failure to submit the requested data or inability to show sufficient qualification as determined by the Town of Nahant shall be reason for disqualification of the Bidder. The Town of Nahant reserves the right to waive any or all qualification requirements if it feels it is in the best interest of the Town of Nahant.

4. **INFORMATION NOT GUARANTEED**

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

4.2 It is agreed and understood that the Town of Nahant 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.

4.3 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 Town of Nahant 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 or other structures actually encountered during the construction work, except as may otherwise be expressly provided for in the Contract Documents.

5. **BIDDERS TO INVESTIGATE**

5.1 Bidders must satisfy themselves by personal examination of the site 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, the difficulties attendant upon its execution, and the accuracy of all estimated quantities stated in the Bid.

6. **QUESTIONS REGARDING DRAWINGS AND DOCUMENTS**

6.1 In general, no answer will be given to prospective bidders in reply to an oral question if the question involves an interpretation 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 Town of Nahant or the Engineer on account thereof.

6.2 To receive consideration, such questions shall be submitted in writing to the Town’s Engineer, Kleinfelder, at LNolan@Kleinfelder.com, with a carbon copy to ZTaylor@Nahant.org at least seven calendar days before the established date for receipt of Bids.

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

6.4 The Contractor agrees to use and base his/her bid on the products and methods designated or described in the Specifications as amended by the Addenda.

7. **BLANK FORM FOR BID**

7.1 All bids must be upon the blank form for Bid annexed hereto, state the proposed price of each item of the Work, both in words and in figures, and be signed by the bidder with his business address and place of residence.

8. **BID SECURITY**

8.1 Each bid must be accompanied by cash or a certified check, or a treasurer's or cashier's check issued by, a responsible bank or trust company and payable to the order of the Town of Nahant or by a bid bond prepared on the form of BID BOND (see Section 00410) attached hereto duly executed and acknowledged by the bidder, as Principal, and by a surety company qualified to do business in the Commonwealth of Massachusetts and satisfactory to the Town of Nahant, as Surety. The cash check or bid bond shall be in the sum of 5 percent of the value of the Bid and shall be enclosed in the sealed envelope containing the Bid.

8.2 Every bid bond, every performance bond and every payment bond issued for any construction work in the commonwealth shall be the bond of a surety company organized pursuant to Section 105 of Chapter 175 or of a surety company authorized to do business in Commonwealth under the provisions of Section 106 of said Chapter 175 and be approved by the U.S. Department of Treasury and acceptable as sureties and reinsurers on federal bonds under Title 31 of the United States Code, sections 9304 to 9308.

8.3 Each such check, bid bond, or cash amount may be held by the Town of Nahant 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 cash or bid check shall become the property of the Town of Nahant or if a bid bond was furnished the bid bond shall become payable to the Town of Nahant, as liquidated damages; otherwise, the cash or 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.

8.4 Bid securities 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 (Sundays and legal holidays excluded) after the Town of Nahant 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 Town of Nahant within thirty (30) consecutive days after the opening of Bids, the bid security
will be returned promptly to any bidder who has not been notified of the acceptance of his Bid.

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

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

9. **WITHDRAWAL OF BIDS**

9.1 Except as hereinafter in this subsection otherwise expressly provided, once his Bid is submitted and received by the Town of Nahant for consideration and comparison with other bids similarly submitted, the bidder agrees that he may not and will not withdraw it within thirty days excluding Saturdays, Sundays and legal holidays after the actual date of the opening of Bids.

9.2 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 Town of Nahant, at any time subsequent to the expiration of the period during which the bidder has agreed not to withdraw his Bid.

9.3 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 Town of Nahant notifies a bidder in writing that his Bid is rejected or that the Town of Nahant 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.

10. **RIGHT TO REJECT BIDS**

10.1 The Town of Nahant reserves the right to reject any or all Bids, should the Town of Nahant deem it to be in the public interest to do so.

10.2 The Town of Nahant may reject Bids which in its sole judgment are either, incomplete, conditional, obscure or not responsive or which contain additions not called for, erasures not properly initialed, alterations, or similar irregularities, or the Town of Nahant may waive such omissions, conditions or irregularities.
11. **COMPARISON OF BIDS**

11.1 Determination of the lowest responsible Bidder will be accomplished in the following manner. First, bids for the Base Bid will be compared against available funds (as determined by the Town). If available funds remain following that comparison, Alternate Bid Items will be added to the Base Bid in ascending order until available funds are exhausted, or all Alternate Items have been added, and the determination of the lowest responsible Bidder will be determined on that basis.

11.2 In the event that there is a discrepancy in the Bid between the unit prices written in words and figures, the prices written in words shall govern. In case of discrepancy obtained by multiplying the estimated quantity by the unit price, and the extended amount, the product obtained shall govern. In case of discrepancy between total of extended amounts and the total amount of bid stated, the total of the items shall govern.

11.3 The Town of Nahant agrees to examine and consider each Bid submitted in consideration of the Bidder's agreements, as hereinabove set forth and as set forth in the BID.

12. **REDUCTION IN SCOPE OF WORK**

12.1 The Town of Nahant 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 Town of Nahant reserves the right to reduce the quantity of any items or omit all of any items as set forth in the BID, either prior to executing the Contract or at any time during the progress of the work. The Town of Nahant 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 Town of Nahant of the above rights shall not constitute any ground or basis of claim for damages or for anticipated profits on the work omitted.

13. **CONTRACT BONDS**

13.1 The Bidder whose Bid is accepted agrees to furnish the Contract Bonds in the forms which follow in Section No. 00610 Performance Bond and Section 00620 Payment Bond, each in the sum of the full amount of the Contract and duly executed by the said bidder as Principal and by a surety company qualified to do business under the laws of the Commonwealth of Massachusetts and satisfactory to the Town of Nahant, 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.

13.2 Every bid bond, every performance bond and every payment bond issued for any construction work in the Commonwealth shall be the bond of a surety company organized pursuant to Section 105 of Chapter 175 or of a surety company authorized
to do business in Commonwealth under the provisions of Section 106 of said Chapter 175 and be approved by the U. S. Department of Treasury and acceptable as sureties and reinsurers on federal bonds under Title 31 of the United States Code, sections 9304 to 9308.

14. **EXECUTION OF AGREEMENT**

14.1 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.

14.2 If the contract amount exceeds $100,000, the Bidder to whom the Contract is awarded shall comply with the provisions of Chapter 30, Section 39R of the General Laws of Massachusetts as amended to date; and as provided therein shall, prior to execution of the contract, file a statement of management on internal accounting controls and an audited financial statement for the most recent completed fiscal year.

15. **INSURANCE CERTIFICATE**

15.1 The Contractor will not be permitted to start any construction work until approved certificates covering all insurances called for under Article 5 of Section 00710 have been submitted.

16. **MASSACHUSETTS SALES AND USE TAX**

16.1 Materials and equipment purchased for permanent installation in this project will be exempt from the Massachusetts Sales and Use Tax. The exemption certificate number will be furnished to the Contractor. Each bidder shall take this exemption into account in calculating his bid for the work.

17. **MASSACHUSETTS WAGE RATES**

17.1 Massachusetts Wage Rates as established pursuant to the provisions of M.G.L. Chapter 149 Section 26-27G apply to this project. The Massachusetts Wage Determination is attached to these specifications. It is the responsibility of the Contractor, before bid opening, to request, if necessary, any additional information on Massachusetts Wage Rates for those trades’ people who are not covered by the applicable Massachusetts Wage Decision, but who may be employed for the proposed work under this contract.

17.2 Contractor shall submit payroll certificates to the Engineer on a weekly basis. Payments will not be approved without payroll certificates.
18. **MANUFACTURER'S EXPERIENCE**

18.1 Wherever it is written that an equipment manufacturer must have a specified period of experience with his product, equipment which does not meet the specified experience period can be considered if the equipment supplier or manufacturer is willing to provide a bond or cash deposit for the duration of the specified time period which will guarantee replacement of that equipment in the event of failure. Such bond shall be an Efficiency Guarantee Bond executed on a form to be approved by the Town of Nahant.

19. **HEALTH REGULATIONS AND SAFETY**

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

19.2 The Successful Bidder shall comply with the Department of Labor Safety and Health Regulations for Construction promulgated under the Occupational Safety and Health Act of 1970 (PL-91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL-91-54).

19.3 The Successful Bidder shall have a competent person or persons, as required under the Occupational Safety and Health Act on the Site to inspect the Work and to supervise the conformance of the Work with the regulations of the Act.

20. **ACCESS TO WORK**

20.1 Representatives of the Commonwealth and any local agencies having a direct interest in the Work shall have access to the Work under this contract wherever it is in preparation or progress and which required the Contractor to provide proper facilities for such access and inspection.

21. **CHANGE ORDERS**

21.1 Change orders will be processed in accordance with the General Conditions.

22. **CERTIFICATION OF PAYMENT TO SUBCONTRACTORS & SUPPLIERS**

22.1 Payment to subcontractors shall be made in accordance with General Laws Chapter 30, Section 39F, which is incorporated by reference herein. Payment shall not be made to the General Contractor for a given pay period until they have verified payment to suppliers and subcontractors by submitting a subcontractor/subconsultant/supplier payment certificate.
23. **UTILITY UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM**
   23.1 All excavations within public or private ways are subject to the requirements of Massachusetts General Law and OSHA Regulations.

24. **COMPETITIVE BIDDING**
   24.1 The bidding and award of the Contract shall be in full compliance with Section 39 M inclusive of Chapter 30 of the General Laws of the Commonwealth of Massachusetts as last revised.

   24.2 If at the time this contract is to be awarded, the lowest bid submitted by a responsible eligible bidder does not exceed the amount of funds then estimated by the Town of Nahant as available to finance the contract; the contract will be awarded on the basis of such bid. If such bid exceeds such amount, the Town of Nahant may reject all bids or take other action deemed to be in the best interest of the Town of Nahant.

25. **CONTRACTOR'S GUARANTEE**
   25.1 The Contractor guarantees the work under this contract and the materials furnished by him for use in connection therewith to be free from defects or flaws for one (1) year after the completion of the contract, and guarantees for a term of one (1) year from the date of final completion of the work to maintain the stability of all materials, equipment or workmanship, except that due to normal wear and tear, at his/her own expense when notified in writing to do so by the Engineer and such work shall be performed to the satisfaction of the Engineer. Paving shall be guaranteed for one year. If at any time within said guarantee period, any part of the work constructed under the terms of this contract shall in the opinion of the Engineer require repair or replacement due to defective work or materials furnished by the Contractor, he/she may notify the Contractor in writing to make the required work and repairs (including all labor and materials) and the Contractor shall perform the same within 10 days. If he/she shall not do so, the Town of Nahant may do it and charge the Contractor.

   25.2 It is expressly understood, however, that these guarantee provisions shall not absolve the Contractor from any liability to the Town of Nahant arising out of a failure to substantially complete the work in accordance with the plans and specifications.

   25.3 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.

26. **TRAFFIC POLICE**
   26.1 Traffic control, when required by the Chief of Police or the Town of Nahant, will normally be paid for directly by the Public Works Department. However, any police
overtime expenses incurred by the Town due to the Contractor electing to work longer than the normal workday shall be the responsibility of the Contractor, the cost of which will be deducted from the monthly pay requisition. The Contractor will also be charged for police expenses when police coverage is requested, but the Contractor does not work. The Contractor is responsible for the arrangement of any and all Police traffic control details stating at the time of the request that the detail is for a Town of Nahant project. The Contractor is also responsible for the cancellation of any Police Detail. If not cancelled 4 hours prior to the time of the Detail, the Contractor will pay the 4 hour minimum for that Detail; and the cost will be deducted from the monthly pay requisition.

27. THIRD PARTY WORK

27.1 The Contractor is responsible for maintaining a safe and secure worksite at all times, and for expeditiously repairing any damage done to private property. If, in the opinion of the Town of Nahant, the Contractor is negligent in these duties the Town of Nahant shall have the right to employ a third party to remedy the problem.

27.2 Situations which develop and require the services of and payment to a third party will be handled in the following manner:

A. The Contractor will be given a reasonable period of time determined at the discretion of the Town of Nahant to remedy the situation without third party involvement. If the Contractor is unavailable the Town of Nahant will authorize work by a third party on the Contractor's behalf.

B. Third party work authorized on the Contractor's behalf by the Town of Nahant shall be paid for by the Contractor within a reasonable time period (generally two weeks). If payment is not made within a reasonable time period the Town of Nahant will make payment and deduct the cost from the next payment requisition.

C. In the case of inadequately secured worksites necessitating extra or increased police details or other public safety personnel, the following procedure will be followed. The Contractor (if available) will be notified that the worksite needs to be secured in order to prevent the need for weekend/night police coverage. If the area is not immediately secured as determined by the Town of Nahant or Engineer, a police, fire, or highway department detail will be used and the Contractor will be charged for the cost. It is understood that in many instances worksites cannot realistically be secured to a point where police or other public safety personnel are not needed. In these instances, the Town of Nahant will continue to pay for the coverage.

END OF SECTION
SECTION 00301

BID

To the Town of Nahant, herein called the Owner, acting by and through, it’s Department of Public Works for 2020 Water Main Improvements.

The Undersigned, as 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 anned 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 DPW;

(7) 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 payment there for the lump sum or unit price applicable to each item of the Work as stated in the schedule below.

(Note: Bidders must bid on each item. **Bidders must bid the same unit price, with the exception of lump sum items, for those bid items appearing in BOTH the Base Bid and the Alternate Bids.** All entries in the entire BID must be made clearly and typewritten or in ink. In case of discrepancy between prices in writing and in figures; the writing shall govern. In case of discrepancy between the product obtained by multiplying the estimated quantity by the unit price, and the extended amount, the product obtained shall govern. In case of discrepancy between total of extended amounts and total amount of bid stated, total of items shall govern. Use the pages in this document when submitting proposal and submit contract documents intact).

Refer to Section 01025 - Measurement and Payment for Item Descriptions.

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Quantity</th>
<th>Extended Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mobilization, the sum of $ per LS</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Temporary Utility Support and Coordination, the sum of $ per LS</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Quality Control and Testing, the sum of $ per LS</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Sedimentation and Erosion Control Measures, the sum of $ per LS</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Test Pits, the sum of $ per EA</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Item No.</td>
<td>Description</td>
<td>Quantity</td>
<td>Extended Total</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td>----------</td>
<td>----------------</td>
</tr>
<tr>
<td>6</td>
<td>Temporary Water Bypass, the sum of Dollars ($ ) per LS</td>
<td>1</td>
<td>$</td>
</tr>
<tr>
<td>7</td>
<td>Traffic Management, the sum of Dollars ($ ) per LS</td>
<td>1</td>
<td>$</td>
</tr>
<tr>
<td>8a</td>
<td>6” PVC Water Main, the sum of Dollars ($ ) per LF</td>
<td>10</td>
<td>$</td>
</tr>
<tr>
<td>8b</td>
<td>8” PVC Water Main, the sum of Dollars ($ ) per LF</td>
<td>1,170</td>
<td>$</td>
</tr>
<tr>
<td>9a</td>
<td>6” D.I. Gate Valve and Box, the sum of Dollars ($ ) per EA</td>
<td>1</td>
<td>$</td>
</tr>
<tr>
<td>9b</td>
<td>8” D.I. Gate Valve and Box, the sum of Dollars ($ ) per EA</td>
<td>4</td>
<td>$</td>
</tr>
<tr>
<td>10</td>
<td>D.I. Fittings, Couplings, and Restraints - the sum of Dollars ($ ) per POUND</td>
<td>850</td>
<td>$</td>
</tr>
<tr>
<td>11</td>
<td>Hydrants, the sum of Dollars ($ ) per EA</td>
<td>1</td>
<td>$</td>
</tr>
<tr>
<td>12</td>
<td>1” Water Service, Type K copper, the sum of Dollars ($ ) per LF</td>
<td>150</td>
<td>$</td>
</tr>
<tr>
<td>13a</td>
<td>Mechanical Joint Restraints, the sum of Dollars ($ ) per EA</td>
<td>35</td>
<td>$</td>
</tr>
<tr>
<td>13b</td>
<td>Push on Restraints, the sum of Dollars ($ ) per EA</td>
<td>15</td>
<td>$</td>
</tr>
<tr>
<td>Item No.</td>
<td>Description</td>
<td>Quantity</td>
<td>Extended Total</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------</td>
<td>----------------</td>
</tr>
<tr>
<td>14</td>
<td>PVC for Sewer/Drain Repair, the sum of Dollars ($ ) per LF</td>
<td>20</td>
<td>$</td>
</tr>
<tr>
<td>15</td>
<td>Abandon Water Main, the sum of Dollar ($) per LF</td>
<td>150</td>
<td>$</td>
</tr>
<tr>
<td>16</td>
<td>Rock Excavation, the sum of Dollar ($) per CY</td>
<td>5</td>
<td>$</td>
</tr>
<tr>
<td>17</td>
<td>Gravel Subbase, the sum of Dollar ($) per CY</td>
<td>110</td>
<td>$</td>
</tr>
<tr>
<td>18</td>
<td>For 2.5” Hot Mix Asphalt Binder Course, the sum of Dollar ($) per TON</td>
<td>125</td>
<td>$</td>
</tr>
<tr>
<td>19</td>
<td>For 1.5” Hot Mix Asphalt Top Course, the sum of Dollar ($) per TON</td>
<td>75</td>
<td>$</td>
</tr>
</tbody>
</table>

**Total Amount of Base Bid (Basis of Award)**  
(Items 1 through 19)

$  
(Amount in figures)

(Amount in words)
Owner’s Bid Alternate 1 Price Sheet

For 8” Water Main and Appurtenances in Mills Terrace. Failure to provide a cost for this item will be basis for rejection of the bid.

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Quantity</th>
<th>Extended Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Test Pits, the sum of __________________________</td>
<td>2</td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>Dollars ($                     ) per EA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Temporary Water Bypass, the sum of</td>
<td>1</td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>Dollars ($                     ) per LS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Traffic Management, the sum of</td>
<td>1</td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>Dollars ($                     ) per LS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8a</td>
<td>6” PVC Water Main, the sum of</td>
<td>20</td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>Dollars ($                     ) per LF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8b</td>
<td>8” PVC Water Main, the sum of</td>
<td>180</td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>Dollars ($                     ) per LF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9a</td>
<td>6”D.I. Gate Valve and Box, the sum of</td>
<td>1</td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>Dollars ($                     ) per EA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9b</td>
<td>8” D.I. Gate Valve and Box, the sum of</td>
<td>1</td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>Dollars ($                     ) per EA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9c</td>
<td>1” Corporation Valve and Box, the sum of</td>
<td>3</td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>Dollars ($                     ) per EA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>D.I. Fittings, Couplings, and Restraints - the sum of</td>
<td>300</td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>Dollars ($                     ) per POUND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Hydrants, the sum of</td>
<td>1</td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>Dollars ($                     ) per EA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item No.</td>
<td>Description</td>
<td>Quantity</td>
<td>Extended Total</td>
</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------------------------------------</td>
<td>----------</td>
<td>----------------</td>
</tr>
<tr>
<td>12</td>
<td>1” Water Service, Type K copper, the sum of Dollars ($) per LF</td>
<td>100</td>
<td>$</td>
</tr>
<tr>
<td>13a</td>
<td>Mechanical Joint Restraints, the sum of Dollars ($) per EA</td>
<td>12</td>
<td>$</td>
</tr>
<tr>
<td>13b</td>
<td>Push on Restraints, the sum of</td>
<td>6</td>
<td>$</td>
</tr>
<tr>
<td>14</td>
<td>PVC for Sewer/Drain Repair, the sum of Dollars ($) per LF</td>
<td>5</td>
<td>$</td>
</tr>
<tr>
<td>16</td>
<td>Rock Excavation, the sum of</td>
<td>5</td>
<td>$</td>
</tr>
<tr>
<td>17</td>
<td>Gravel Subbase, the sum of</td>
<td>20</td>
<td>$</td>
</tr>
<tr>
<td>18</td>
<td>For 2.5” Hot Mix Asphalt Binder Course, the sum of Dollars ($) per TON</td>
<td>28</td>
<td>$</td>
</tr>
<tr>
<td>19</td>
<td>For 1.5” Hot Mix Asphalt Top Course, the sum of Dollars ($) per TON</td>
<td>17</td>
<td>$</td>
</tr>
</tbody>
</table>

**Total Amount of Bid Alternate 1**  
(Items 1 through 19)

$  
(Amount in figures)

(Amount in words)
Owner’s Bid Alternate 2 Price Sheet

For 8” Water Main and Appurtenances in Howe Road from Little Nahant Road to Hydrant #28. Failure to provide a cost for this item will be basis for rejection of the bid.

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Quantity</th>
<th>Extended Total</th>
</tr>
</thead>
</table>
| 5        | Test Pits, the sum of
          | 2         | $           |
|          | Dollars ($) per EA |          |               |
| 6        | Temporary Water Bypass, the sum of
          | 1         | $           |
|          | Dollars ($) per LS |          |               |
| 7        | Traffic Management, the sum of
          | 1         | $           |
|          | Dollars ($) per LS |          |               |
| 8a       | 6” PVC Water Main, the sum of
          | 20        | $           |
|          | Dollars ($) per LF |         |               |
| 8b       | 8” PVC Water Main, the sum of
          | 250       | $           |
|          | Dollars ($) per LF |         |               |
| 9a       | 6” D.I. Gate Valve and Box, the sum of
          | 1         | $           |
|          | Dollars ($) per EA |          |               |
| 9b       | 8” D.I. Gate Valve and Box, the sum of
          | 2         | $           |
|          | Dollars ($) per EA |          |               |
| 10       | D.I. Fittings, Couplings, and Restraints - the sum of
          | 360       | $           |
|          | Dollars ($) per POUND |       |               |
| 11       | Hydrants, the sum of
          | 1         | $           |
|          | Dollars ($) per EA |          |               |
| 12       | 1” Water Service, Type K copper, the sum of
<pre><code>      | 100       | $           |
</code></pre>
<p>|          | Dollars ($) per LF |          |               |</p>
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Quantity</th>
<th>Extended Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>13a</td>
<td>Mechanical Joint Restraints, the sum of Dollars ($) per EA</td>
<td>16</td>
<td>$</td>
</tr>
<tr>
<td>13b</td>
<td>Push on Restraints, the sum of Dollars ($) per EA</td>
<td>6</td>
<td>$</td>
</tr>
<tr>
<td>14</td>
<td>PVC for Sewer/Drain Repair, the sum of Dollars ($) per LF</td>
<td>5</td>
<td>$</td>
</tr>
<tr>
<td>16</td>
<td>Rock Excavation, the sum of Dollars ($) per CY</td>
<td>10</td>
<td>$</td>
</tr>
<tr>
<td>17</td>
<td>Gravel Subbase, the sum of Dollars ($) per CY</td>
<td>25</td>
<td>$</td>
</tr>
<tr>
<td>18</td>
<td>For 2.5” Hot Mix Asphalt Binder Course, the sum of Dollars ($) per TON</td>
<td>24</td>
<td>$</td>
</tr>
<tr>
<td>19</td>
<td>For 1.5” Hot Mix Asphalt Top Course, the sum of Dollars ($) per TON</td>
<td>14</td>
<td>$</td>
</tr>
</tbody>
</table>

Total Amount of Bid Alternate 2  
(Items 1 through 19)  

$  
(Amount in figures)  

(Amount in words)
# Owner’s Bid Alternate 3 Price Sheet

For 8” Water Main and Appurtenances in Howe Road from Hydrant #28 to end. Failure to provide a cost for this item will be basis for rejection of the bid.

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Quantity</th>
<th>Extended Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Test Pits, the sum of Dollars ($) per EA</td>
<td>4</td>
<td>$</td>
</tr>
<tr>
<td>6</td>
<td>Temporary Water Bypass, the sum of Dollars ($) per LS</td>
<td>1</td>
<td>$</td>
</tr>
<tr>
<td>7</td>
<td>Traffic Management, the sum of Dollars ($) per LS</td>
<td>1</td>
<td>$</td>
</tr>
<tr>
<td>8a</td>
<td>6” PVC Water Main, the sum of Dollars ($) per LF</td>
<td>30</td>
<td>$</td>
</tr>
<tr>
<td>8b</td>
<td>8” PVC Water Main, the sum of Dollars ($) per LF</td>
<td>260</td>
<td>$</td>
</tr>
<tr>
<td>9a</td>
<td>6”D.1. Gate Valve and Box, the sum of Dollars ($) per EA</td>
<td>1</td>
<td>$</td>
</tr>
<tr>
<td>9c</td>
<td>1” Corporation Valve and Box, the sum of Dollars ($) per EA</td>
<td>2</td>
<td>$</td>
</tr>
<tr>
<td>10</td>
<td>D.I. Fittings, Couplings, and Restraints - the sum of</td>
<td>150</td>
<td>$</td>
</tr>
<tr>
<td></td>
<td>Dollars ($) per POUND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Hydrants, the sum of Dollars ($) per EA</td>
<td>1</td>
<td>$</td>
</tr>
<tr>
<td>12</td>
<td>1” Water Service, Type K copper, the sum of Dollars ($) per LF</td>
<td>130</td>
<td>$</td>
</tr>
<tr>
<td>Item No.</td>
<td>Description</td>
<td>Quantity</td>
<td>Extended Total</td>
</tr>
<tr>
<td>---------</td>
<td>------------------------------------------------------------------------------</td>
<td>----------</td>
<td>----------------</td>
</tr>
<tr>
<td>13a</td>
<td>Mechanical Joint Restraints, the sum of Dollars ($) per EA</td>
<td>5</td>
<td>$</td>
</tr>
<tr>
<td>13b</td>
<td>Push on Restraints, the sum of Dollars ($) per EA</td>
<td>2</td>
<td>$</td>
</tr>
<tr>
<td>16</td>
<td>Rock Excavation, the sum of Dollars ($) per CY</td>
<td>170</td>
<td>$</td>
</tr>
<tr>
<td>17</td>
<td>Gravel Subbase, the sum of Dollars ($) per CY</td>
<td>30</td>
<td>$</td>
</tr>
<tr>
<td>18</td>
<td>For 2.5” Hot Mix Asphalt Binder Course, the sum of Dollars ($) per TON</td>
<td>40</td>
<td>$</td>
</tr>
<tr>
<td>19</td>
<td>For 1.5” Hot Mix Asphalt Top Course, the sum of Dollars ($) per TON</td>
<td>24</td>
<td>$</td>
</tr>
</tbody>
</table>

Total Amount of Bid Alternate 3
(Items 1 through 19)

$ (Amount in figures)

(Amount in words)
Determination of the lowest responsible Bidder will be accomplished in the following manner. First, bids for the Base Bid will be compared against available funds (as determined by the Town). If available funds remain following that comparison, Alternate Bid Items will be added to the Base Bid in ascending order until available funds are exhausted, or all Alternate Items have been added, and the determination of the lowest responsible Bidder will be determined on that basis.

The undersigned agrees that for extra work, if any, will be performed in accordance with Article 10 of the General Conditions of the Contract and will be paid for in accordance with Article 11 of the General Conditions of the Contract.

The bid security accompanying this BID shall be in the amount of 5 percent of the BID.

If this BID is accepted by the Owner, the undersigned agrees to complete the entire work provided to be done under the Contract, exclusive of final paving, within 138 calendar days as stipulated in the AGREEMENT. Liquidated damages for each calendar day of delay shall be $2,000 as stipulated in the AGREEMENT.

As provided in the INSTRUCTIONS TO BIDDERS, the bidder hereby agrees that he/she will not withdraw this BID within thirty 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 ten (10) days after notification that the AGREEMENT and other Contract Documents are ready for signature.

Should the bidder fail to fulfill any of his agreements as hereinabove set forth, the Owner shall have the right to retain as liquidated damages the amount of the bid check or cash which shall become the Owner's property. 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.

The undersigned agrees that for extra work, if any, will be performed in accordance with Article 10 of the General Conditions of the Contract and will be paid for in accordance with Article 11 of the General Conditions of the Contract.

(To be filled in by Bidder if Addenda are issued.)

This BID includes Addenda number ___ to ____

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.

The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work and that he will comply fully with all laws and regulations applicable to awards made subject to MGL Ch. 30, Section 39M. The bidding and award of the contract will be in full compliance with Section 39M inclusive of Chapter 30 of the General Laws of the Commonwealth of Massachusetts as last revised.

The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated there under.
Pursuant to M.G.L. Ch. 62C, sec. 49A, I certify under the penalties of perjury that I, to my best knowledge and belief, have filed all state tax returns and paid all state taxes required under law.

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.

The attached CERTIFICATE OF NON-COLLUSION must be signed and submitted as part of the Bid Proposal.
CERTIFICATE AS TO CORPORATE BIDDER

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

By __________________________
(Signature and title of authorized representative)

______________________________
(Telephone)  
(Business address)

______________________________
(Fax Number)  
(City and State)

______________________________
(email)  
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.)

Bidder shall submit the following with bid:

1. Bid Bond in amount of 5% of bid (00410 or Bond Company Certificate).
2. Acknowledgement of Addenda (pg. 6)
3. Certificate as to Corporate Bidder. (pg. 8)
4. Certificate of Authority. (pg. 9)
5. Certificate of Payment of State Taxes. (pg. 10)
6. Certificate of Non-Collusion. (pg. 11)
7. Bidders Qualifying Information (pg. 12)
   • Three projects demonstrating:
     o 5,000 lf water main installation
     o 100 water services
     o Temporary bypass
     o Cost over $3 million

Failure to submit these items shall be cause for rejection of bid by the Owner.
CERTIFICATE OF AUTHORITY

At a duly authorized meeting of the Board of Directors of the __________________________
(name of corporation)

held on ________ Directors were present or waived notice, it was voted that ________________
(date)

____________________of this company be and hereby is authorized to execute contracts and bonds
(name and title)

in the name and behalf of said company, and affix its Corporate Seal thereto, and such execution
of any contract or bond of obligation in this company's name on its behalf of such ________________
(OFFICER)

under seal of the company shall be valid and binding upon this company.

A TRUE COPY,

ATTEST: ____________________________

Place of Business:

____________________________________

____________________________________

I hereby certify that I am the ______________________ of the ____________________________
>Title) (Name of Corporation)

that __________________________ is the duly elected ______________________ of said
(Name of Officer) (Title)

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

Signature: ____________________________

Name/Title: ____________________________

Date: ________________________________
(Corporate Seal)

COMMONWEALTH OF MASSACHUSETTS, SS. ______________________, 20____.

Then personally appeared the above named ______________________ and acknowledged the
foregoing instrument to be his/her free act and deed before me.

NOTARY PUBLIC ____________________________

My commission expires: ____________________
Pursuant to M.G.L.c.62C, s49A, 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 that I have filed all state tax returns and paid all State Taxes required under law.

*Signature of Individual or Corporate Name (Mandatory)
(Mandatory) **Social Security Number or Federal Identification Number

By: ____________________ Date: ____________________________
Corporate Officer
(Mandatory, if Applicable)

*Approval of a contract or other agreement will not be granted unless this certification clause is signed by the applicant.

**Your social security number will be furnished to the Massachusetts Department of Revenue to determine whether you have met tax filing and tax payment obligations. Providers who fail to correct their non-filing or delinquency status will not have a contract or other agreement issued, renewed, or extended. This request is made under the authority of Mass. G.L.C.62c, Sec.49A.
CERTIFICATE OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this bid or proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

____________________________________
(Signature of Person Signing Bid)

____________________________________
(Company)
BIDDER'S QUALIFYING INFORMATION

Bidder:

____________________________________________________

Address:

____________________________________________________

Previous experience in this field is _____ years

<table>
<thead>
<tr>
<th>Project Name</th>
<th>&gt; 5,000 LF of Water Main</th>
<th>&gt;100 water services</th>
<th>Temporary by-pass</th>
<th>Cost over USD 3,000,000</th>
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Municipalities for which the bidder has performed work or supplied materials within the past twenty-four months.

<table>
<thead>
<tr>
<th>CITY/TOWN</th>
<th>PROJECT</th>
<th>NAME OF PERSON</th>
<th>PHONE #</th>
</tr>
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<tbody>
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<td>4.</td>
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<tr>
<td>5.</td>
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</tbody>
</table>

Equipment owned by the Bidder and intended for use on jobs in the Town of Nahant MA:

____________________________________________________

Bidder shall list all projects that his/her company defaulted on and reasons for defaults

____________________________________________________

END OF SECTION
SECTION 00410

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, ______________________
_________________________________________________________ as Principal, and
_________________________________________________________ as Surety, are hereby
held and firmly bound unto ________________________________ as
Owner in the penal sum of ________________________________
for the payment of which, well and truly to be made, we hereby jointly and severally bind
ourselves, successors and assigns.

Signed, this ____________________ day of __________________, 2020.

The Conditions of the above obligation is such that whereas the Principal has submitted to
________________________________________________________ a certain BID, attached
hereto made a part hereof to enter into a contract in writing, for the

________________________________________________________

NOW, THEREFORE,

(a) If said BID shall be rejected, or

(b) If said BID shall be accepted and the Principal shall execute and deliver a contract in
the Form of Contract attached hereto (properly completed in accordance with said
BID) and shall furnish a BOND for his faithful performance of said contract, and for
the payment of all persons performing labor or furnishing materials in connection
therewith, and shall in all other respects perform the agreement created by the
acceptance of said bid, then this obligation, shall be void, otherwise the same shall
remain in force and effect; it being expressly understood and agreed that the liability
of the Surety for any and all claims hereunder shall, in no event exceed the penal
amount of this obligation as herein stated.
The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID and said Surety does hereby waive notice of any such extension.

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, the day and year first set forth above.

_________________________________
Principal

_________________________________
Surety

By: ________________________________

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.

END OF SECTION 00410
THIS AGREEMENT made on ____________ in the Town of Nahant, Essex County, Commonwealth of Massachusetts, by and between ______________ (hereinafter called the Contractor), and the Town of Nahant, a municipal corporation within said County of Essex (hereinafter alternatively called the Town or the Owner or the Awarding Authority).

WITNESSETH:

That the Contractor, in consideration of payments hereinafter mentioned and of the fulfillment of the agreements entered into, agrees with the Town as follows:

1. SCOPE OF WORK:
The Contractor shall, pursuant to the terms of this contract, provide all the supplies, materials and equipment, and perform all the labor, services and supervision necessary and proper for the installment of approximately 1,170 linear feet of 8-inch PVC water main and appurtenances on Walton Road, and Furbush Road. The improvements include abandonment or removal of approximately 875 linear feet of 1-inch water main, installing new hydrants, service connections, and providing a temporary water by-pass system, as directed and detailed in the Contract Documents for the Department of Public Works, Water Division in the Town of Nahant, Massachusetts, and to accomplish any and all work incidental thereto. Surface restoration work includes permanent trench patching. Sidewalks, curbs, driveways, and grass areas will be restored in-kind. Bid alternatives include an additional 690 linear feet of 8-inch PVC water main and appurtenances on Mills Terrace and Howe Road, including appurtenances and surface restoration as directed and detailed in the Contract Documents.

The Work includes, but is not necessarily limited to, the following major items:

1. Grading, excavating, filling, backfilling and compacting for pipe laying, and for resurfacing.
2. Provide temporary by-pass piping required.
3. Furnish and install all water pipes, fittings, valves, service connections, hydrants, capping at existing mains and connections to new mains, complete, including necessary appurtenances and service fittings.
4. Furnish and install project signs and traffic control devices as specified, or as required.
5. Furnish and install necessary valves and reducers.
6. Perform testing and disinfection of water main and correct all failure, leaks and/or breaks.
7. Remove and dispose of removed pipe as well as excess material from excavation not required for fill or backfill at the expense of the Contractor, and to the satisfaction of the Owner.
8. Perform required roadway paving operations.
2. PERFORMANCE AND PAYMENT BONDS:
The Contractor shall obtain and deposit with the Town the following bond(s) in the amount of:

<table>
<thead>
<tr>
<th>Bond Type</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERFORMANCE BOND</td>
<td>100% of Contract Amount</td>
</tr>
<tr>
<td>PAYMENT BOND</td>
<td>100% of Contract Amount</td>
</tr>
</tbody>
</table>

with sureties satisfactory to the Contracting Officer to (a) guarantee the faithful performance by the Contractor of all its obligations under this contract and (b) constitute the security required by Massachusetts General Laws Chapter 30, Section 39A, as amended, for payment by the Contractor and its subcontractors for all labor performed or furnished and for all materials used or employed in connection with the contract. Each bond shall incorporate by reference the terms of this contract. The bonds shall be executed by a surety or sureties, acceptable to the Town.

3. CONTRACTING OFFICER:
Wherever used in this Contract the term "Contracting Officer" shall mean the Town Official so designated below, or the individual duly appointed by that person for the performance of any of the functions or responsibilities under this Contract.

The work shall be carried out under the direction and subject to the approval and acceptance of Zachary Taylor, (hereinafter called the Contracting Officer).

4. INCORPORATED DOCUMENTS:
(a) The performance of this contract is subject to the provisions of the following documents, all of which are intended to be an integral part of this contract (hereinafter periodically and collectively referred to as the “contract documents”):

(i) Invitation and Instructions to Bidders
(ii) Bid Proposal
(iii) Specifications and Plans
(iv) General Conditions of the Contract for Construction
(v) Supplementary General Conditions of the Contract for Construction
(vi) Change orders issued hereafter and any other amendments executed in writing by both parties.

5. INTERPRETATION, CORRELLATION AND INTENT
(a) The contract documents are to be read collectively and complementary to one another; any requirement under one shall be as binding as if required by all. In the event of any conflict or inconsistency between the provisions of this contract and any of the other contract documents, the provisions of this contact shall prevail. In the event of any conflict or inconsistency between this contact, the contract documents and any applicable state law, the applicable statutory provisions shall prevail.

(b) Shop drawings and other submittals from the Contractor do not constitute a part of the contract documents. The Contractor shall not do any work requiring shop drawings or other submittals unless such shall have been approved in writing by the Engineer. All work requiring approved shop drawings or other submittals shall be done in strict compliance with such approved documents. However, approval by the Engineer for the Town shall not be evidence that such
work installed pursuant thereto conforms with the requirements of this contract. The Engineer/Town shall have no duty to review partial submittals or incomplete submittals.

(c) The Contractor shall have a continuing duty to read, examine, review, compare and contrast each of the contract documents and shop drawings and other submittals and shall give written notice to the Engineer and the Town of any conflict, ambiguity, error or omission which the Contractor finds with respect to these documents before proceeding with the affected work, and shall request additional specifications, drawings and/or instructions. The Contractor shall not proceed with any work not adequately defined for it. If the Contractor proceeds with such work without obtaining such additional specifications, drawings and/or instructions, the contractor shall correct work incorrectly done at the Contractor's expense. The express or implied approval by the Engineer or the Town of any shop drawings or other submittals shall not relieve the Contractor of the continuing duties imposed hereby, nor shall any such approval be evidence of the Contractor's compliance with this Contract. The Owner has requested the Engineer to prepare specifications and plans for this project, which are accurate, adequate, consistent, coordinated and sufficient for construction. However, the Town makes no representation or warranty of any nature whatsoever to the Contractor concerning such specifications and plans. The Contractor hereby acknowledges and represents that it has received, reviewed and carefully examined such specifications and plans, has found them to be complete, accurate, adequate, consistent, coordinated and sufficient for construction, and that the Contractor has not, does not and will not rely upon any representations or warranties by the Town concerning such specifications and plans, as no such representations or warranties have been or are hereby made.

6. ENGINEER:
   The Engineer for this project is Kleinfelder Northeast, Inc.

7. TIME FOR PERFORMANCE:

(a) Time of the Essence - Time is of the essence for this Contract. By executing this Contract, the Contractor confirms that the contract time is a reasonable period of time for performing the work and achieving substantial completion. The work of this contract must be substantially completed within 138 days of Notice to Proceed, excluding final paving.

(b) Definition of Substantial Completion - The term "substantial completion" as used in the contract shall mean the point at which, as certified in writing by the Engineer, the Project is at a level of completion in strict compliance with this contract such that the Town or its designee can enjoy beneficial use or occupancy and can use or operate it in all respects, for its intended purpose.

(c) Liquidated Damages - Because both parties recognize (1) that the time for completion of this Contract is of the essence, (2) that the Town will suffer loss if the work is not completed within the contract time specified, plus any extension thereof allowed in accordance with the provisions of this contract, and (3) the delays, expense and difficulties involved in a legal proceeding to determine the actual loss suffered by the Town if the work is not completed in time, it is agreed that the Contractor will pay the Town as liquidated damages representing an estimate of delay damages, not as a penalty, the sum of Two Thousand Dollars ($2,000) per day for each calendar day of delay beyond the first day of delay until the work is completed. The Town's right to impose liquidated damages shall in no way prohibit or restrict the Town's right to bring a legal action for damages in lieu of its option to impose liquidated damages. The Town may deduct any
liquidated damages from money due the Contractor, and if such moneys are insufficient to cover the liquidated damages, then the Contractor shall pay the amount due.

8. **PRICE:**
The Town will pay the Contractor for all materials delivered or furnished and for all the work performed pursuant to Article 1 hereof a sum of money to be determined by the unit prices in the Contractor’s bid proposal and the quantities furnished and installed, as determined by the Engineer.

9. **TAXES:**
The Contractor shall not pay, and the Town shall not reimburse or pay the Contractor or any other party, either directly or indirectly for any tax for which an exemption is provided under law. The Town is exempt from Massachusetts State Sales Tax. The Town will provide a tax exemption number to the Contractor to be used by the Contractor, any subcontractors and their agents with respect to this project.

10. **PAYMENT:**
Payment to the General Contractor shall be made by the Town in accordance with the provisions of General Laws Chapter 30, Section 39K, which is incorporated by reference herein.

   (a) The payment shall be in full for furnishing all materials, supplies, labor, services, supervision, tools and equipment and the use thereof as embraced under the contract and, except as may be provided under Article 12(f), shall also constitute the payment for all loss or damage to the Contractor arising out of the nature of the work or from the action of the elements or from any unforeseen difficulties or obstructions which may arise or be encountered during the prosecution of the work until its final approval by the Contracting Officer, and for all risks to the Contractor of every description connected with the prosecution of the work or infringement of patents, trade marks, or copyrights and for completing the work in an acceptable manner.

   (b) The payment of any periodic estimate or of any retained percentage shall in no way constitute an acceptance of the work or in no way prejudice or affect the obligation of the Contractor at its own cost or expense to repair, correct, renew, or replace any defects or imperfections in the construction as well as all damages due or attributable to such defects, nor shall any such payments for any current estimate or of any retained percentages prejudice or affect the rights of the Town to hold the Contractor liable for breach of contract or avail itself of other remedies under this Contract.

   (c) If at any time there shall be evidence of any lien or other claim for which, if established, the Town may become liable, directly or indirectly, and which is chargeable to the Contractor, the Town may retain out of the payment then due or thereafter to become due, an amount sufficient to completely indemnify it against any such claim. If there proves to be any such claims after all the payments are made, the Contractor shall refund to the Town all moneys that the Town pays in discharging such claim in consequence of the Contractor's default.
11. **PAYMENT OF SUBCONTRACTORS:**
Payment to subcontractors shall be made in accordance with General Laws Chapter 30, Section 39F, which is incorporated by reference herein. Payment shall not be made to the general contractor for a given pay period until they have verified payment to suppliers and subcontractors by submitting a subcontractor/subconsultant/supplier payment certificate.

12. **PERFORMANCE:**
   (a) **Prosecution of Work; Responsibility for Employees and Agents** - The Contractor shall give attention constantly to the faithful prosecution of the work and shall keep the same under its personal control. It shall be responsible for all the acts and omissions of its employees, subcontractors and of all persons directly or indirectly employed by it in connection with the prosecution of this work.

   (b) **Schedule of Operations and Values** - Before commencing the work, the Contractor shall, if required by the Town, submit a schedule of operations that the Contractor proposes to use to substantially complete the project within the date for substantial completion. The approval of the schedule by the Contracting Officer shall not be construed as relieving the Contractor from responsibility.

   The Contractor shall also provide, prior to commencing work, a schedule of values apportioning the contract price among the different elements of the project for purposes of periodic and final payment. The schedule of values shall be presented in such format and with such detail, and backed up with whatever supporting information the Engineer or Town requests. The Contractor shall not imbalance its schedule of values nor artificially inflate any element thereof. The final determination of the schedule of values shall be with the Town. The schedule of values will be utilized for reviewing Contractor's Payment Requests, but shall not prohibit or restrict the Town's judgment as to such payments.

   (c) **Permits and Fees** - Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit and other permits and governmental fees, licenses and inspections necessary for proper execution and completion of the work.

   (d) **Inspection of Work** - At all times relevant to the contract, the Contractor shall permit the Engineer to review or inspect the work without formality or other procedure. The Contractor shall provide sufficient and proper facilities at all times for the inspection of the work by the Town.

   (e) **Testing** - Tests, inspections and approvals of the work required by the Contract Documents or by any federal, state or local laws or regulations or orders of public authorities having jurisdiction shall be made at the required time, and if no time is required, at the appropriate time. The Contractor shall bear the full cost of all such tests, inspections and approvals. The Contractor shall give the Engineer timely notice of when and where tests and inspections are to be made so that each may observe such procedures. All testing methods, organizations and personnel shall be approved by the Engineer before the start of testing work. The Contractor shall, upon written instructions from the Engineer or Town make arrangements for additional testing, inspection and approval if deemed necessary by both the Engineer and Town.
2020 Water Main Improvements AGREEMENT
Nahant, MA 00500-6

(f) Defective Work - The Contractor shall, after receiving written notice that certain work or construction is improper, unsafe or defective or that such construction in any ways fails to conform to the contract, forthwith remove such unsafe or defective construction and reconstruct the same in a manner remedy the construction after being so notified, the Contracting Officer may cause such defective work to be remedied or replaced and the Town may deduct the cost thereof from any moneys due or to become due the Contractor.

(g) Suspension of Work - Contractor's Failure(s) - The Town acting through the Contracting Officer, shall have the authority to suspend the work wholly or any part thereof for such period as the Contracting Officer shall deem necessary due to failure of the Contractor to carry out orders given or to perform any provisions of the Contract. Upon receipt of written order from the Contracting Officer, the Contractor shall immediately suspend the work or such part thereof in accordance with the order. No work shall be resumed when conditions so warrant or deficiencies have been corrected and the condition of the Contract as ordered or approved in writing by the Contracting Officer. No allowance of any kind will be made for suspension of work by order of the Contracting officer to this paragraph.

(h) Suspension of Work - Act of Nature - Should the contractor be obstructed or delayed in the prosecution of the work as a result of damage which may be caused by lightning, earthquake, rain, storm or cyclone or similar act of nature, then the time fixed for completion may be extended for a period equivalent to the time lost by reason of any of the foregoing causes. No such extension shall be made unless a claim therefor is presented in writing to the Contracting Officer within forty-eight hours of the occurrence of any such delay. The Contractor shall have no claim against the Town for damages on account of such delay. The duration of the extension itself must be certified to by the Contracting officer.

(i) Delay or Suspension of Work - All Other Circumstances - The Contractor agrees that it shall have no claim for damages of any kind on account of any delay in commencement of the work. Post commencement, the Contractor shall have no claim for damages of any kind on account of any delay or suspension of any portion of the work except as hereinafter provided. Adjustments, if any, in the contract price due to the suspension, delay, interruption or failure to act by the Town shall be governed by the provisions of General Laws Chapter 30, Section 39(0), which is incorporated by reference herein. Provided, however, that the provisions of this paragraph shall not apply to any suspension pursuant to the extent that such is due to any cause for which this Contract provides for an equitable adjustment for the contract price, or time, under any other contract provision. Provided, further that no adjustment shall be made if the performance of the Contractor would have been prevented by other causes, even if the work had not been so suspended, delayed or interrupted by the Town. Provided, further, that a subcontractor shall have the same rights against the Contractor for payment for an increase in the cost of his performance as the provisions of this paragraph gives the Contractor against the Town, but nothing herein shall in any way change, modify or alter any other rights which the Contractor and subcontractor may have against each other.

(j) Subsurface or Latent Physical Conditions - Any request for an adjustment in the contract price, due to differing subsurface or latent physical conditions shall be governed by the provisions of General Laws Chapter 30, Section 39N, which is incorporated by reference herein.

(k) Additional Work and Contractors - The Town may award other contracts for additional work. The Contractor shall cooperate fully with other contractors and carefully fit its
own work to that of other contracts as may be directed by the Contracting Officer. The Contractor shall not commit or permit any acts which will interfere with the performance of work by any other contractor.

(1) Compliance With Laws - The Contractor shall keep itself fully informed of and comply with all existing and future federal, state and municipal laws and regulations and all orders and decrees of any governmental bodies or tribunals (hereinafter also referred to as "laws") having jurisdiction in any manner which affect this contract or construction, including, but not limited to such laws affecting those engaged or employed in the work, the materials used in the work or in any way affecting the conduct of the work. If any clause in this contract does not conform to such law, then such clause shall be void and the law operative shall be inserted in lieu thereof. If any discrepancy or inconsistency is discovered in the specifications, drawings or contract documents in violation of the law, the Contractor shall forthwith report the same in writing to the Town. The Contractor shall cause its employees, agents and subcontractors to also observe and comply with all such laws. It shall protect and indemnify the Town and its officials, employees and duly appointed agents against any claim or liability arising from or based on any violation, whether by the Contractor or its officials, employees or subcontractors, of any such law.

(m) (NOT REQUIRED AS PART OF THIS CONTRACT) Explosives - When the use of explosives is necessary for the prosecution of the Work, the Contractor shall take the utmost care not to endanger life and property. Whenever directed, the number and size of the charges shall be reduced. All explosives shall be stored in a secure manner. All such storage places shall be marked clearly "DANGEROUS-EXPLOSIVES", and shall be in the care of competent watchmen at all times. The method of storage and handling of explosives and highly inflammable materials shall conform with all State Laws and Regulations, as well as any local requirements.

(n) Dig Safe Laws - The Contractor shall fully comply with the Dig Safe Laws.

(o) Removal of Equipment, Temporary Structures and Materials - Upon the completion of the work, the Contractor shall at its own expense remove all equipment, temporary Contractor's buildings and sheds, fencing, rubbish and waste material in and about the area that has been worked and it shall leave the premises and the work performed all in a neat and proper condition.

13. ADDITIONAL WORK:
(a) The Contractor agrees to perform any work related to the Subject Matter of the contract, but not within the scope of the contract and its specifications, upon written order of the Engineer. A price agreed upon between the parties and stipulated in the order for extra work; or a price based on the unit prices of the contract.

(b) When alterations increase the quantity of standard of the work to be done, payment for such increase shall be made in the same way that payment is made for extra work under (a). Where such alterations diminish the quantity or standard of the work to be done, and adjustment shall be made to the benefit of the Town based upon the unit prices where used or.
14. **EMPLOYMENT:**

   (a) **Competence** - The Contractor shall employ workers competent to perform the work required by this contract and if notified by the Contracting Officer in writing that any person engaged upon the work is incompetent, unfaithful, disorderly or otherwise unsatisfactory, then such worker shall be discharged for the work.

   (b) **Restriction on Hours** - No labor, worker, mechanic, foreman or inspector working within the Commonwealth of Massachusetts in the employ of the Contractor, subcontractors or other persons doing or contracting to do the whole or part of the work contemplated by this contract, shall be required or permitted to work more than eight hours in any one calendar day; or more than forty-eight hours in one week, or more than six days in any one week in full compliance with the provisions of General Laws c. 149, section 34, except in cases of emergency.

   (c) **Weekly Wages** - GENERAL LAWS c. 149, sec. 148, requires the weekly payment of employees.

   (d) **Lodging, Board, Trade – Freedom** - Every employee in the work covered by the contract shall lodge, board and trade where and with whom he elects and neither the Contractor nor its agents or employees shall directly or indirectly require as a condition of employment therein that an employee shall lodge, board or trade at a particular place or with a particular person.

   (e) **Sanitary Facilities** - The Contractor shall provide and maintain in a neat and sanitary condition such accommodations for the use of his employees as may be necessary to comply with the requirements of the appropriate authorities. The maintenance of all sanitary facilities shall be subject to the laws of the Commonwealth and to the rules and regulations of the State Board of Health and the Board of Health for the Town of Canton.

   (f) **Workers Compensation** - The Contractor shall, before commencing the work, provide by insurance for the payment of compensation and the furnishing of other benefits under Chapter 152 of the General Laws to all persons employed under the Contract, and it shall continue such insurance in force and effect during the term thereof. The Town may require the Contractor to deliver certificates of insurance as sufficient proof of compliance with the foregoing. Failure to provide and continue in force such insurance as aforesaid shall be deemed a material breach of the Contract and shall entitle the Town to terminate the Contract without in any way being liable in damages therefor.

   (g) **Register of Employees** - The Contractor shall keep a true and accurate register of all mechanics, teamsters, chauffeurs and laborers employed upon the work contemplated by this Contract, showing the name, address and occupational classification of each such employee, the hours worked by and the wages paid to each such employee, and shall furnish the Massachusetts Department of Labor and Industries upon its request a true statement thereof.

   (h) **Wage Rates (General Laws c. 149, sec. 26, et. se.a.)** - In conformity with the provisions of the laws of the Commonwealth of Massachusetts, the minimum wages paid to craftsmen, teamsters, mechanics, laborers and apprentices shall not be less than those established by a schedule which has been prepared by the Department of Labor and Industries and which is included in the Appendix. Payments by employers to health and welfare plans, pension plans and supplementary unemployment benefit plans under collective bargaining agreements or
understandings between organized labor and employers shall be included for the purpose of establishing minimum wage rates as herein provided. The Town shall assume no responsibility for the accuracy of the rates set forth in the schedule and no claims for additional Compensation will be considered because of any inaccuracy in the rates so set forth. The schedule of wages referred to above are minimum rates only, the Town will not consider any claim for additional compensation made by the Contractor because of any payment by the Contractor of any wage rate in excess of said minimum rates. All substantive and procedural requirements of the minimum wage rate laws shall be met. The schedule of wages shall be kept posted in a conspicuous place at the site of the work.

(i) "Right To Know" Law - If the Contractor uses or stores toxic or hazardous substances he is subject to General Laws c. 111F, sec. 2 the "Right To Know" law and regulations promulgated by the Department of Public Health, the Department of Environmental Protection and the Department of Labor and Industries; and must post a Workplace Notice obtainable from the Department of Labor and Industries.

(j) Preference To Veterans and Citizens In Public Works - General Laws, Chapter 149, Section 26 is incorporated by reference herein.

15. TERMINATION:
(a) If the Contractor shall be adjudged as bankrupt, or if it shall make a general assignment for the benefit of his creditors, or if a receiver of its property shall be appointed, or if the work to be done under the contract shall be abandoned, or if the contract or any part thereof shall be sublet without the previous written consent of the Contracting Officer or if the contract or any claim thereunder shall be assigned by the Contractor otherwise than as herein specified, or if at any time the Contracting Officer shall be of the opinion that the work, or any part thereof, is unnecessarily or unreasonably delayed, or that the Contractor has violated any of the provisions of the contract, the Contracting Officer, for and on behalf of the Town, may notify the Contractor to discontinue all work, or any part thereof; and thereupon the Contractor shall discontinue such work or such part thereof as the Contracting Officer may designate, remove its equipment, tools, supplies and materials as the Contracting Officer directs, and the Town may thereupon, by contract or otherwise, as it may determine, complete the work, or such part thereof, and charge the entire expense of so completing the work or any part thereof to the Contractor. In such case, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the Contract price shall exceed the expense of finishing the work, including compensation for additional Engineering, managerial, legal and administrative services, such excess shall be paid to the Contractor. If such expenses shall exceed such unpaid balances, the Contractor shall pay the difference to the Town. The obligation for payment shall survive the termination of the Contract.

(b) If the Contracting Officer shall certify by written notice to the Contractor that the rate of progress is not satisfactory, the Town may, instead of notifying the Contractor to discontinue all of the work or any part thereof, notify it from time to time to increase the force, equipment and plant, or any of them, employed on the whole or any part of the work, stating the amount of increase required. Unless the Contractor shall, within five days after such notice, increase its force, equipment and plant to the extent required therein, and maintain and employ the same from day to day until the completion of the work or such part thereof or until the conditions as to the rate of progress shall, in the opinion of the Contracting Officer, be fulfilled, the Town may employ and direct the labors of such additional force, equipment and plant as may, in the
opinion of the Contracting Officer, be necessary to insure the completion of the work or such part thereof within the time specified or at the earliest possible date thereafter, and charge the expense thereof to the Contractor. Neither the notice from the Contracting Officer to the Contractor to increase its force, equipment or plant nor the employment of additional force, equipment or plant by the Town shall be held to prevent a subsequent notice to the Contractor from the Town to discontinue the work under the provisions of the preceding portion of this article.

(c) All expenses charged under this article shall be deducted by the Town out of moneys then due or to become due the Contractor under this contract, or any part thereof. In such accounting the Town shall not be obligated to obtain the lowest figures for the work of completing the contract or any part thereof, or for insuring its proper completion, and all sums actually paid by the Town shall be charged to the Contractor. If the expense so charged is greater than the sum which would have been payable under the contract if the same had been completed by the Contractor, then the Contractor shall pay the amount of the excess to the Town upon completion of the work and without further demand being made therefor.

(d) The Contractor shall not be relieved of liability to the Town by virtue of any termination of this contract, and any claim for damages against the Contractor relating to the Contractor's performance under this contract shall survive any termination hereunder.

(e) Notwithstanding any other provision of this Agreement, the Town reserves the right at any time in its absolute discretion to suspend or terminate this Agreement in whole or in part for its convenience upon seven days written notice to the Contractor. The Town shall incur no liability by reason of such termination except for the obligation to pay compensation for all work performed by the Contractor and accepted by the Town to the termination date.

16. GUARANTEES:

(a) The Contractor guarantees and warrants to the Town that all labor furnished under this Contract will be competent to perform the tasks undertaken, that the product of such labor will yield only first-class results, that materials and equipment furnished will be of good quality and new unless otherwise permitted by this Contract, and that the Work will be of good quality, free from faults and defects and in strict conformance with this Contract. All Work not conforming to these requirements may be considered defective.

(b) If at any time any part of the work constructed under the terms of this contract shall in the opinion of the Contracting Officer require repairing due to defective work or materials furnished by the Contractor, he may notify the Contractor in writing to make the required repairs. If the Contractor shall neglect to start such repairs within ten days of the date of giving it notice thereof and to complete the same to the satisfaction of the Contracting Officer with reasonable dispatch, then the latter may employ other persons to make such repairs. The Town shall charge the expense thereof to the Contractor and may use any moneys still retained to pay for the same, and if such sum is insufficient, the Contractor shall be obligated to pay the balance thereof.

(c) All guarantees and warranties required in the various Sections of the Specifications which originate with a Subcontractor or Manufacturer must be delivered to the Town before final payment to the Contractor may be made for the amount of that subtrade or for the phase of work to which the guarantee or warranty relates. The failure to deliver a required guarantee or warranty shall be held to constitute a failure of the Subcontractor to fully complete his work in accordance with the Contract Documents. The Contractor's obligation to correct work
is in addition to, and not in substitution of, such guarantees or warranties as may be required in the various Sections of the Specifications.

17. **INDEMNIFICATION:**
   (a) The Contractor shall indemnify and defend and save harmless the Town and all of its officers, agents and employees against all suits, demands, claims, judgments or liability of every name, nature, and description arising out of, relating to, or in consequence of the acts or omissions of the Contractor, or any subcontractor, in the performance of the work covered by the contract or the failure to comply with the terms and conditions thereof; and the Contractor shall at its own cost and expense defend any and all such suits and actions.

   (b) The Contractor shall bear all losses resulting from the use or storage of explosives and highly inflammable materials and shall indemnify, defend and save harmless the Town and all of its officers, agents, and employees from all suits, demands, claims, liabilities or judgments for bodily injuries or death to any person and for property damage or destruction arising out of the use or storage of explosives and highly inflammable materials.

   (c) The Contractor further covenants to indemnify, defend and hold harmless the Town, its officers, agents, and employees from and against each and every demand, claim, judgment or liability for or on account of the use of any patented invention, article or appliance included in the materials and equipment agreed to be furnished, supplied or used under this contract.

18. **INSURANCE:**
   (a) The Contractor shall purchase and maintain such insurance as will protect the Contractor from claims which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by itself or by any Subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable. Specific insurance requirements are detailed in Article 5 of Section 07100 - General Conditions.

19. **CLAIMS BY CONTRACTOR AND LIABILITY OF TOWN**
   (a) All claims by the Contractor against the Town shall, unless otherwise provided by law, be initiated by a written claim submitted to the Town and the Engineer no later than seven (7) calendar days after the event or the first appearance of the circumstances causing the claim. The claim shall set forth in detail all known facts and circumstances supporting the claim. The Contractor shall continue its performance under this contract regardless of the submission or existence of any claims.

   (b) The limit of liability of the Town under this Agreement is limited to the compensation provided herein for work actually performed, and shall in no event include liability for incidental, special or consequential damages or lost profits or for damages of loss from causes beyond the Town's reasonable control.

20. **CONTRACT EXECUTION AND ADMINISTRATION**
   (a) **Clerk's Certificate – Corporation** - If the Contractor is a corporation, it shall endorse upon the contract (or attach hereto) it's Clerk's Certificate certifying the corporate capacity and authority of the party signing this contract for the corporation. Such certificate shall be accompanied by a letter or other instrument stating that such authority continues in full force and effect as of the date the contract is executed by the Contractor.
(b) **Foreign Corporation** - The Contractor, if a foreign corporation, shall comply with GENERAL LAWS c. 181, sec. 3 and 5 and GENERAL LAWS c. 30, sec. 39L.

(c) **Municipal Prerequisites** - This contract shall not be enforceable against the Town unless and until the Contractor complies with this section. This contract is only binding upon, and enforceable against the Town if:
1. The contract is signed by the Superintendent of Public Works, or its designee; and
2. The contract is endorsed with approval by the Town Accountant as to appropriation or availability of funds; and

(d) **Subject To Appropriation** - The obligations of the Town hereunder shall be subject to appropriation on a fiscal year basis. In the absence of appropriation, this Agreement shall be terminated immediately without liability of the Town for damages, lost profits, penalties, or other charges arising from early termination.

(e) **Conflict of Interest**

1. Both the Town and the Contractor stipulate to the applicability of the State Conflict of Interest Law (General Laws Chapter 268A), and this contract expressly prohibits any activity which shall constitute a violation of that law. The Contractor shall be deemed to have investigated its applicability to the performance of this contract; and by executing the contract documents the Contractor certifies to the Town that neither it nor its agents, employees or subcontractors are thereby in violation of General Laws Chapter 268A.

2. The Contractor warrants that it has complied with all provisions of law regarding the award of this contract and that it, or its employees, agents, officers, directors or trustees have not offered or attempted to offer anything of any value to any official or employee of the Town in connection with this Contract.

3. The Contractor further warrants that no official or employee of the Town including unpaid members of Town boards and commissions, serves as an officer, director, trustee or employee of Contractor, and that no official or employee of the Town has or will have a direct or indirect financial interest in this contract.

4. The Contractor shall not during the term of this Contract hire or employ on either a full-time or part-time basis any person or persons employed by the Town.

5. Violation of this Article shall be a material breach of this contract and shall be grounds for immediate termination of this contract by the Town without regard to any enforcement activities undertaken or completed by any enforcement agency. Termination of this contract pursuant to this Article shall not waive any claims for damages the Town may have against the Contractor resulting from the Contractor's violation of the terms of this Article.

(f) **Assignment or Transfer of Contract** - This Contractor shall not assign by power of attorney or otherwise, or sublet the work or any part thereof, without the previous written consent of the Town by its Contracting officer, and shall not, either legally or equitably, assign any of the moneys payable under this contract or his claim thereto, without the written consent of the Town.
The Contractor shall not assign by power of attorney or otherwise nor sublet the work or any part thereof without the previous written consent of the Contracting Officer. It shall not either legally or equitably assigning any of the moneys payable under this Contract or any claim thereto unless by and with like written consent on the part of the Contracting Officer and the Town Treasurer.

(g) **Claims and Disputes** - Claims, disputes or other matters in question between the ties to this Agreement arising out of or relating to this Agreement or breach thereof shall be subject to and decided by the Superior Court of Massachusetts, in Essex County, if jurisdiction exists, and if jurisdiction does not exist in the Superior Court, said action shall be brought in the District Court of Massachusetts, Lynn to be tried according to the applicable laws of the Commonwealth of Massachusetts. A claim, dispute or other matter may be submitted to Arbitration, in accordance with the provisions of the standard Form of Arbitration of the American Arbitration Association, at the sole discretion of the Town.

(h) **Governing Law** - This Contract shall be governed by the laws of the Commonwealth of Massachusetts.

(i) **Waiver** - All requirements, conditions, duties and obligations of the Contractor contained in this contract may be waived only by a written instrument from the Town. Forbearance or indulgence in any form or manner by the Town shall not be construed as a waiver, nor in any manner limit the legal or equitable remedies available to the Town. No waiver by the Town of any default or breach shall constitute a waiver of any subsequent default or breach by the Contractor.

21. **OTHER STATUTORY REQUIREMENTS**

(a) **Record Keeping and Management Controls** - The Contractor shall comply with GENERAL LAWS c. 30, s. 39R.

(b) **Non-Discrimination** - The Contractor shall not discriminate on grounds of race, color, religious creed, national origin, age or sex in employment practices, in the selection or retention of sub-contractors, the procurement of material and rental of equipment, employment decisions or in any aspect of the performance of this contract. The Contractor shall also comply with all applicable laws and regulations pertaining to non-discrimination. In all solicitations either by competitive bidding or negotiation made by the Contractor for work to be performed under a subcontract, each potential sub-contractor shall be notified by the Contractor of the Contractor's obligations under this contract relative to non-discrimination and it shall be a term of each contact with a sub-contractor in connection with the performance of this work under this Agreement, that the sub-contractor be bound to non-discrimination and equal opportunity requirements equivalent to the obligations of the Contractor hereunder.

(c) **Reserve Police Officer** - In accordance with General Laws, Chapter 149, Section 34B, the Contractor shall pay to any reserve police officer employed by it the prevailing wage paid to regular police officers.

22. **SEVERABILITY:**
If any provision of this contract is held invalid by any court or body of competent jurisdiction, the remainder of this contract shall remain in full force and effect.
23.  **HEADINGS:**  
The section headings in this contract are-for convenience and reference only and in no way define or limit the scope or content of this contract or in any way affect its provisions.

24.  **AMENDMENTS:**  
This Contract may be amended or modified only by written instrument duly executed by the parties.

25.  **LIABILITY OF PUBLIC OFFICIALS:**  
To the full extent permitted by law, no official, employee, agent or representative of the Town shall be individually or personally liable on any obligation of the Town under this contract.

26.  **INDEPENDENT CONTRACTOR**  
The Contractor is not an employee or agent of the Town, but is an independent contractor.

27.  **NO PRIVITY OF CONTRACT BETWEEN TOWN AND OTHER PARTIES**  
Nothing contained in this Contract shall create, or be interpreted to create, privity or any other contractual agreement between the Town and any person or entity other than the Contractor.

28.  **BINDING ON SUCCESSORS:**  
This contract shall be binding upon the Contractor, its assigns, transferees, and/or successors in interest (and where not corporate, the heirs and estate of the contractor).

29.  **COMPLETE CONTRACT**  
This instrument, together with its endorsed supplements, and the other components of the contract documents, constitutes the entire contract between the parties with no agreements other than those incorporated herein.

30.  **CERTIFICATION OF NON-DEBARMENT OR SUSPENSION**  
By execution of this Contract, the Contractor, pursuant to Section 29F of Chapter 29 of the Massachusetts General Laws, certifies under the penalties of perjury that it is not presently debarred or suspended from doing public construction work in the Commonwealth pursuant to said section, or any applicable debarment or suspension provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

(See next page for signatures)
IN WITNESS WHEREOF the Contractor has hereunder set its hand and seal and the Town has caused this Contract to be executed in its name and behalf by a duly authorized officer thereof the day and year first above written.

TOWN OF CANTON

I hereby certify that there is an unencumbered balance of $________ available for this contract and furthermore that this sum is hereby encumbered against the appropriate account for the purpose of this agreement. Further, I hereby certify that as funds become available, I will encumber additional amounts of money as are required under this contract.

___________________________________
Town Accountant

___________________________________
Procurement Officer for this project under delegation of CPO

By and Through its

___________________________________
Supt. of Public Works, Zachary Taylor
Town of Nahant, MA.

END OF SECTION
SECTION 00550

NOTICE OF AWARD

TO:

Project Description: 2020 Water Main Improvements

The OWNER has considered the BID submitted by you for the above described WORK in response to its Invitation to Bid dated ________________, and Instructions to Bidders.

You are notified that your Bid dated ________________ 2020, for the above Contract has been considered. You are the apparent successful Bidder and have been awarded a Contract for

The Contract Price of your Contract is ________________

__________________________ Dollars ($ ).

You are required by the Instructions to Bidders to execute the Agreement and furnish the required CONTRACTOR's Performance BOND, Payment BOND, Attestation of Tax Compliance, and certificates of insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDs within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER's acceptance of your BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this ___ day of ____________, 2020.

_________________________________

Zachary Taylor,
Superintendent of Public Works
Town of Nahant, MA
ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by

___________________________________________,
this ______________________________ day of ________________________, 2020.

By _________________________________
Title___________________________________________

END OF SECTION
KNOW ALL MEN BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

a ________________________, hereinafter called Principal, (Corporation, Partnership or Individual)

and

(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto _________________________________

Town of Nahant

(Name of Owner)

(Town Hall, 334 Nahant Road, Nahant, MA 01908)

(Address of Owner)

hereinafter called OWNER, in the penal sum of:

Dollars ($ )

in lawful money of the United States, for the payment of which sum and truly to be made, we bind
ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a
certain contract with the OWNER, dated the _______________________
day of ______________________ 2020, a copy of which is hereto attached and made a part hereof for the
construction of:

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

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

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

IN WITNESS WHEREOF, this instrument is executed in ___________ counterparts, each one of which shall be deemed an original, this the ______ day of ______________, 2020.

ATTEST:

________________________________________
Principal

Principal’s Secretary

[SEAL]

By ______________________________ (s)

(Address)

Witness as to Principal

(Address)

Surety

ATTEST:

___________________________
Surety Secretary

[SEAL]

Witness as to Surety

(Address)

Attorney-in-Fact

(Address)

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

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.

END OF SECTION
SECTION 00620
PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: that

__________________________________________
(Name of Contractor)

__________________________________________
(Address of Contractor)

__________________________________________
(Corporation, Partnership or Individual)

__________________________________________
(Name of Surety)

__________________________________________
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

Town of Nahant
(Name of Owner)

Town Hall, 334 Nahant Road, Nahant, MA 01908
(Address of Owner)

hereinafter called OWNER, in the penal sum of:

__________________________________________

Dollars ($ ____________ )

in lawful money of the United States, for the payment of which sum and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the ______________________ day of ____________________ 2020, a copy of which is hereto attached and made a part hereof for the construction of:

__________________________________________

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

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

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

IN WITNESS WHEREOF, this instrument is executed in (number) counterparts, each one of which shall be deemed an original, this the ______ day of ______________, 2020.

ATTEST:

Principal

Principal's Secretary

By _____________________________ (s)

__________________________________

Witness as to Principal

(Address)

__________________________________

Surety

By _____________________________

ATTEST: Attorney-in-Fact

Witness as to Surety

(Address)

(Address)

__________________________________

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

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.

END OF SECTION
SECTION 00630
CERTIFICATE OF SUBSTANTIAL COMPLETION

DATE OF ISSUANCE __________________________

OWNER __________________________
Town of Nahant Department of Public Works

CONTRACTOR __________________________

Contract: __________________________
Project: 2020 Water Main Improvements

OWNER’s Contract No. __________________________
ENGINEER’s Project No. __________________________

This Certificate of Substantial Completion applies to all Work under the Contract Documents or to the following specified parts thereof:

To __________________________
Town of Nahant Department of Public Works
OWNER

And To __________________________
CONTRACTOR

The Work to which this Certificate applies has been inspected by authorized representatives of OWNER, CONTRACTOR and ENGINEER, and that Work is hereby declared to be substantially complete in accordance with the Contract Documents on

DATE OF SUBSTANTIAL COMPLETION __________________________

A tentative list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include an item in it does not alter the responsibility of CONTRACTOR to complete all the Work in accordance with the Contract Documents. The items in the tentative list shall be completed or corrected by CONTRACTOR within ________ days of the above date of Substantial Completion.
The responsibilities between OWNER and CONTRACTOR for security, operation, safety, maintenance, heat, utilities, insurance and warranties and guarantees shall be as follows:

OWNER: 

CONTRACTOR: 

The following documents are attached to and made a part of this Certificate:

[For items to be attached see definition of Substantial Completion as supplemented and other specifically noted conditions precedent to achieving Substantial Completion as required by Contract Documents.]

This certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of CONTRACTOR’s obligation to complete the Work in accordance with the Contract Documents.

Executed by ENGINEER on ________________

Engineer

By: ________________________________

(Authorized Signature)

CONTRACTOR accepts this Certificate of Substantial Completion on ________________

Contractor

By: ________________________________

(Authorized Signature)

OWNER accepts this Certificate of Substantial Completion on ________________

Owner

By: ________________________________

(Authorized Signature)
SECTION 00650

NOTICE TO PROCEED

TO: ________________________________  Date: __________________

Project: 2020 Water Main Improvements.

_______________________________
_______________________________
_______________________________
_______________________________
(Name & Address)

You are hereby notified to commence WORK in accordance with the AGREEMENT dated __________________, and you are to complete the WORK within 60 consecutive calendar days thereafter. The date of completion of all WORK is therefore ____________________. Also, before you may start any WORK at the site, you must:

_______________________________

_______________________________

Dept. of Public Works, Nahant, MA

By ___________________________

Title ______ Superintendent_______

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by

_______________________________, this

_____ day of ___________, 2020

_______________________________

By ___________________________

Title __________________________

END OF SECTION
These General Conditions have been prepared for use with the Agreement Between Owner and Contractor for Construction Contract (EJCDC® C-520, Stipulated Sum, or C-525, Cost-Plus, 2013 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other.
To prepare supplementary conditions that are coordinated with the General Conditions, use EJCDC’s Guide to the Preparation of Supplementary Conditions (EJCDC® C-800, 2013 Edition). The full EJCDC Construction series of documents is discussed in the Commentary on the 2013 EJCDC Construction Documents (EJCDC® C-001, 2013 Edition).

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# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

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ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

1.01 Defined Terms

A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term’s singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. **Addenda**—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. **Agreement**—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.

3. **Application for Payment**—The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. **Bid**—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

5. **Bidder**—An individual or entity that submits a Bid to Owner.

6. **Bidding Documents**—The Bidding Requirements, the proposed Contract Documents, and all Addenda.

7. **Bidding Requirements**—The advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.

8. **Change Order**—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.

9. **Change Proposal**—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.

10. **Claim**—(a) A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein: seeking an adjustment in Contract Price or Contract Times, or both; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer’s decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to
address; or seeking other relief with respect to the terms of the Contract; or (b) a demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer’s decision regarding a Change Proposal; or seeking resolution of a contractual issue that Engineer has declined to address. A demand for money or services by a third party is not a Claim.

11. **Constituent of Concern**—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to (a) the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§9601 et seq. (“CERCLA”); (b) the Hazardous Materials Transportation Act, 49 U.S.C. §§5501 et seq.; (c) the Resource Conservation and Recovery Act, 42 U.S.C. §§6901 et seq. (“RCRA”); (d) the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq.; (e) the Clean Water Act, 33 U.S.C. §§1251 et seq.; (f) the Clean Air Act, 42 U.S.C. §§7401 et seq.; or (g) any other federal, state, or local statute, law, rule, regulation, ordinance, resolution, code, order, or decree regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.

12. **Contract**—The entire and integrated written contract between the Owner and Contractor concerning the Work.

13. **Contract Documents**—Those items so designated in the Agreement, and which together comprise the Contract.

14. **Contract Price**—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.

15. **Contract Times**—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.

16. **Contractor**—The individual or entity with which Owner has contracted for performance of the Work.

17. **Cost of the Work**—See Paragraph 13.01 for definition.

18. **Drawings**—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.

19. **Effective Date of the Contract**—The date, indicated in the Agreement, on which the Contract becomes effective.

20. **Engineer**—The individual or entity named as such in the Agreement.

21. **Field Order**—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.

22. **Hazardous Environmental Condition**—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated in the Work, and that are...
controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, does not establish a Hazardous Environmental Condition.

23. **Laws and Regulations; Laws or Regulations**—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

24. **Liens**—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.

25. **Milestone**—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date or by a time prior to Substantial Completion of all the Work.

26. **Notice of Award**—The written notice by Owner to a Bidder of Owner’s acceptance of the Bid.

27. **Notice to Proceed**—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.

28. **Owner**—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.

29. **Progress Schedule**—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor’s plan to accomplish the Work within the Contract Times.

30. **Project**—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

31. **Project Manual**—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Agreement, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.

32. **Resident Project Representative**—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative or “RPR” includes any assistants or field staff of Resident Project Representative.

33. **Samples**—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.

34. **Schedule of Submittals**—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals and the performance of related construction activities.
35. **Schedule of Values**—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.

36. **Shop Drawings**—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.

37. **Site**—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands furnished by Owner which are designated for the use of Contractor.

38. **Specifications**—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.

39. **Subcontractor**—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.

40. **Substantial Completion**—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion thereof.

41. **Successful Bidder**—The Bidder whose Bid the Owner accepts, and to which the Owner makes an award of contract, subject to stated conditions.

42. **Supplementary Conditions**—The part of the Contract that amends or supplements these General Conditions.

43. **Supplier**—A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.

44. **Technical Data**—Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (a) subsurface conditions at the Site, or physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) or (b) Hazardous Environmental Conditions at the Site. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then the data contained in boring logs, recorded measurements of subsurface water levels, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical or environmental report prepared for the Project and made available to Contractor are hereby defined as Technical Data with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06.
45. **Underground Facilities**—All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including but not limited to those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, fiber optic transmissions, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

46. **Unit Price Work**—Work to be paid for on the basis of unit prices.

47. **Work**—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.

48. **Work Change Directive**—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

### 1.02 Terminology

A. The words and terms discussed in the following paragraphs are not defined but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.

B. **Intent of Certain Terms or Adjectives:**

   1. The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.

C. **Day:**

   1. The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.

D. **Defective:**

   1. The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:

      a. does not conform to the Contract Documents; or
b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or

c. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or 15.04).

E. **Furnish, Install, Perform, Provide:**

1. The word “furnish,” when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word “install,” when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

F. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

**ARTICLE 2 – PRELIMINARY MATTERS**

**2.01 Delivery of Bonds and Evidence of Insurance**

A. **Bonds:** When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. **Evidence of Contractor’s Insurance:** When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract), the certificates and other evidence of insurance required to be provided by Contractor in accordance with Article 6.

C. **Evidence of Owner’s Insurance:** After receipt of the executed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each named insured and additional insured (as identified in the Supplementary Conditions or otherwise), the certificates and other evidence of insurance required to be provided by Owner under Article 6.
2.02 **Copies of Documents**

A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully executed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.

B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 **Before Starting Construction**

A. **Preliminary Schedules:** Within 10 days after the Effective Date of the Contract (or as otherwise specifically required by the Contract Documents), Contractor shall submit to Engineer for timely review:

1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 **Preconstruction Conference; Designation of Authorized Representatives**

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.

B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 **Initial Acceptance of Schedules**

A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.03.A. Contractor shall have an additional 10 days to make corrections and
adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor’s full responsibility therefor.

2. Contractor’s Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor’s Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.

2.06 Electronic Transmittals

A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may transmit, and shall accept, Project-related correspondence, text, data, documents, drawings, information, and graphics, including but not limited to Shop Drawings and other submittals, in electronic media or digital format, either directly, or through access to a secure Project website.

B. If the Contract does not establish protocols for electronic or digital transmittals, then Owner, Engineer, and Contractor shall jointly develop such protocols.

C. When transmitting items in electronic media or digital format, the transmitting party makes no representations as to long term compatibility, usability, or readability of the items resulting from the recipient’s use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the items, or from those established in applicable transmittal protocols.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 Intent

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete project (or part thereof) to be constructed in accordance with the Contract Documents.

C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic or digital versions of the Contract Documents (including any printed copies derived from such electronic or digital versions) and the printed record version, the printed record version shall govern.

D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.

E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.
3.02 Reference Standards

A. Standards Specifications, Codes, Laws and Regulations

1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard specification, manual, reference standard, or code, or any instruction of a Supplier, shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees, from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner, Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 Reporting and Resolving Discrepancies

A. Reporting Discrepancies:

1. Contractor's Verification of Figures and Field Measurements: Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.

2. Contractor's Review of Contract Documents: If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract Documents issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. **Resolving Discrepancies**:

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
   
   a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
   
   b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

### 3.04 Requirements of the Contract Documents

A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work thereunder.

B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer’s written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.

C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly give written notice to Owner and Contractor that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

### 3.05 Reuse of Documents

A. Contractor and its Subcontractors and Suppliers shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media editions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner’s express written consent, or violate any copyrights pertaining to such Contract Documents.

B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

4.01 Commencement of Contract Times; Notice to Proceed

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Contract, whichever date is earlier.

4.02 Starting the Work

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to such date.

4.03 Reference Points

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer’s judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 Progress Schedule

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 11.

B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.
4.05 **Delays in Contractor’s Progress**

A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times and Contract Price. Contractor’s entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor’s ability to complete the Work within the Contract Times.

B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.

C. If Contractor’s performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Contractor’s entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor’s ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor’s sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:

1. severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
2. abnormal weather conditions;
3. acts or failures to act of utility owners (other than those performing other work at or adjacent to the Site by arrangement with the Owner, as contemplated in Article 8); and
4. acts of war or terrorism.

D. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5.

E. Paragraph 8.03 governs delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

F. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor.

G. Contractor must submit any Change Proposal seeking an adjustment in Contract Price or Contract Times under this paragraph within 30 days of the commencement of the delaying, disrupting, or interfering event.
ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 Availability of Lands

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner’s interest therein as necessary for giving notice of or filing a mechanic’s or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 Use of Site and Other Areas

A. Limitation on Use of Site and Other Areas:

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor’s operations; (c) damage to any other adjacent land or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.

2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.12, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or at law; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part.
by, or based upon, Contractor’s performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.

B. **Removal of Debris During Performance of the Work:** During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. **Cleaning:** Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. **Loading of Structures:** Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

A. **Reports and Drawings:** The Supplementary Conditions identify:

1. those reports known to Owner of explorations and tests of subsurface conditions at or adjacent to the Site;
2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities); and
3. Technical Data contained in such reports and drawings.

B. **Reliance by Contractor on Technical Data Authorized:** Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor’s purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.
5.04  **Differing Subsurface or Physical Conditions**

A.  **Notice by Contractor:** If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site either:

1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate; or
2. is of such a nature as to require a change in the Drawings or Specifications; or
3. differs materially from that shown or indicated in the Contract Documents; or
4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

B.  **Engineer’s Review:** After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine the necessity of Owner’s obtaining additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A above; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor’s resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer’s findings, conclusions, and recommendations.

C.  **Owner’s Statement to Contractor Regarding Site Condition:** After receipt of Engineer’s written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer’s written findings, conclusions, and recommendations, in whole or in part.

D.  **Possible Price and Times Adjustments:**

1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, or both, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in Contractor’s cost of, or time required for, performance of the Work; subject, however, to the following:
   a. such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
b. with respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,

c. Contractor’s entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor’s ability to complete the Work within the Contract Times.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:

   a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise; or

   b. the existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor’s making such commitment; or

   c. Contractor failed to give the written notice as required by Paragraph 5.04.A.

3. If Owner and Contractor agree regarding Contractor’s entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner’s issuance of the Owner’s written statement to Contractor regarding the subsurface or physical condition in question.

5.05 Underground Facilities

   A. Contractor’s Responsibilities: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or adjacent to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

      1. Owner and Engineer do not warrant or guarantee the accuracy or completeness of any such information or data provided by others; and

      2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

         a. reviewing and checking all information and data regarding existing Underground Facilities at the Site;

         b. locating all Underground Facilities shown or indicated in the Contract Documents as being at the Site;

         c. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
d. the safety and protection of all existing Underground Facilities at the Site, and
repairing any damage thereto resulting from the Work.

B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

C. *Engineer’s Review:* Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor’s resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer’s findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

D. *Owner’s Statement to Contractor Regarding Underground Facility:* After receipt of Engineer’s written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question, addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer’s written findings, conclusions, and recommendations in whole or in part.

E. *Possible Price and Times Adjustments:*

1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, or both, to the extent that any existing Underground Facility at the Site that was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor’s cost of, or time required for, performance of the Work; subject, however, to the following:
   a. Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated the existence or actual location of the Underground Facility in question;
   b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
   c. Contractor’s entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor’s ability to complete the Work within the Contract Times; and
   d. Contractor gave the notice required in Paragraph 5.05.B.
2. If Owner and Contractor agree regarding Contractor’s entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, or both, then any such adjustment shall be set forth in a Change Order.

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, or both, no later than 30 days after Owner’s issuance of the Owner’s written statement to Contractor regarding the Underground Facility in question.

5.06 Hazardous Environmental Conditions at Site

A. Reports and Drawings: The Supplementary Conditions identify:
   1. those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
   2. Technical Data contained in such reports and drawings.

B. Reliance by Contractor on Technical Data Authorized: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data (as defined in Article 1) contained in any geotechnical or environmental report prepared for the Project and made available to Contractor. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors with respect to:
   1. the completeness of such reports and drawings for Contractor’s purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or
   2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or
   3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.

D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.

E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is
responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.

F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.

G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, then within 30 days of Owner’s written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off.

H. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner’s own forces or others in accordance with Article 8.

I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.H shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual’s or entity’s own negligence.

J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and
against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual’s or entity’s own negligence.

K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6 – BONDS AND INSURANCE

6.01 Performance, Payment, and Other Bonds

A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of all of Contractor’s obligations under the Contract. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the Supplementary Conditions, or other specific provisions of the Contract. Contractor shall also furnish such other bonds as are required by the Supplementary Conditions or other specific provisions of the Contract.

B. All bonds shall be in the form prescribed by the Contract except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Circular 570 (as amended and supplemented) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual’s authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

C. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds in the required amounts.

D. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or its right to do business is terminated in any state or jurisdiction where any part of the Project is located, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the bond and surety requirements above.

E. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner’s termination rights under Article 16.
F. Upon request, Owner shall provide a copy of the payment bond to any Subcontractor, Supplier, or other person or entity claiming to have furnished labor or materials used in the performance of the Work.

6.02 Insurance—General Provisions

A. Owner and Contractor shall obtain and maintain insurance as required in this Article and in the Supplementary Conditions.

B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.

C. Contractor shall deliver to Owner, with copies to each named insured and additional insured (as identified in this Article, in the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Contractor has obtained and is maintaining the policies, coverages, and endorsements required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Contractor may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

D. Owner shall deliver to Contractor, with copies to each named insured and additional insured (as identified in this Article, the Supplementary Conditions, or elsewhere in the Contract), certificates of insurance establishing that Owner has obtained and is maintaining the policies, coverages, and endorsements required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies and endorsements, and documentation of applicable self-insured retentions and deductibles. Owner may block out (redact) any confidential premium or pricing information contained in any policy or endorsement furnished under this provision.

E. Failure of Owner or Contractor to demand such certificates or other evidence of the other party’s full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, shall not be construed as a waiver of the other party’s obligation to obtain and maintain such insurance.

F. If either party does not purchase or maintain all of the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.

G. If Contractor has failed to obtain and maintain required insurance, Owner may exclude the Contractor from the Site, impose an appropriate set-off against payment, and exercise Owner’s termination rights under Article 16.
H. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect to obtain equivalent insurance to protect such other party’s interests at the expense of the party who was required to provide such coverage, and the Contract Price shall be adjusted accordingly.

I. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor’s interests.

J. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor’s liability under the indemnities granted to Owner and other individuals and entities in the Contract.

6.03 Contractor’s Insurance

A. Workers’ Compensation: Contractor shall purchase and maintain workers’ compensation and employer’s liability insurance for:
   1. claims under workers’ compensation, disability benefits, and other similar employee benefit acts.
   2. United States Longshoreman and Harbor Workers’ Compensation Act and Jones Act coverage (if applicable).
   3. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor’s employees (by stop-gap endorsement in monopolist worker’s compensation states).
   4. Foreign voluntary worker compensation (if applicable).

B. Commercial General Liability—Claims Covered: Contractor shall purchase and maintain commercial general liability insurance, covering all operations by or on behalf of Contractor, on an occurrence basis, against:
   1. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor’s employees.
   2. claims for damages insured by reasonably available personal injury liability coverage.
   3. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom.

C. Commercial General Liability—Form and Content: Contractor’s commercial liability policy shall be written on a 1996 (or later) ISO commercial general liability form (occurrence form) and include the following coverages and endorsements:
   1. Products and completed operations coverage:
      a. Such insurance shall be maintained for three years after final payment.
      b. Contractor shall furnish Owner and each other additional insured (as identified in the Supplementary Conditions or elsewhere in the Contract) evidence of continuation of such insurance at final payment and three years thereafter.
2. Blanket contractual liability coverage, to the extent permitted by law, including but not limited to coverage of Contractor’s contractual indemnity obligations in Paragraph 7.18.

3. Broad form property damage coverage.

4. Severability of interest.

5. Underground, explosion, and collapse coverage.

6. Personal injury coverage.

7. Additional insured endorsements that include both ongoing operations and products and completed operations coverage through ISO Endorsements CG 20 10 01 and CG 20 37 10 01 (together); or CG 20 10 07 04 and CG 20 37 07 04 (together); or their equivalent.

8. For design professional additional insureds, ISO Endorsement CG 20 32 07 04, “Additional Insured—Engineers, Architects or Surveyors Not Engaged by the Named Insured” or its equivalent.

D. Automobile liability: Contractor shall purchase and maintain automobile liability insurance against claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance, or use of any motor vehicle. The automobile liability policy shall be written on an occurrence basis.

E. Umbrella or excess liability: Contractor shall purchase and maintain umbrella or excess liability insurance written over the underlying employer’s liability, commercial general liability, and automobile liability insurance described in the paragraphs above. Subject to industry-standard exclusions, the coverage afforded shall follow form as to each and every one of the underlying policies.

F. Contractor’s pollution liability insurance: Contractor shall purchase and maintain a policy covering third-party injury and property damage claims, including clean-up costs, as a result of pollution conditions arising from Contractor’s operations and completed operations. This insurance shall be maintained for no less than three years after final completion.

G. Additional insureds: The Contractor’s commercial general liability, automobile liability, umbrella or excess, and pollution liability policies shall include and list as additional insureds Owner and Engineer, and any individuals or entities identified in the Supplementary Conditions; include coverage for the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of all such additional insureds; and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby (including as applicable those arising from both ongoing and completed operations) on a non-contributory basis. Contractor shall obtain all necessary endorsements to support these requirements.

H. Contractor’s professional liability insurance: If Contractor will provide or furnish professional services under this Contract, through a delegation of professional design services or otherwise, then Contractor shall be responsible for purchasing and maintaining applicable professional liability insurance. This insurance shall provide protection against claims arising out of performance of professional design or related services, and caused by
a negligent error, omission, or act for which the insured party is legally liable. It shall be maintained throughout the duration of the Contract and for a minimum of two years after Substantial Completion. If such professional design services are performed by a Subcontractor, and not by Contractor itself, then the requirements of this paragraph may be satisfied through the purchasing and maintenance of such insurance by such Subcontractor.

I. General provisions: The policies of insurance required by this Paragraph 6.03 shall:

1. include at least the specific coverages provided in this Article.

2. be written for not less than the limits of liability provided in this Article and in the Supplementary Conditions, or required by Laws or Regulations, whichever is greater.

3. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed, or renewal refused until at least 10 days prior written notice has been given to Contractor. Within three days of receipt of any such written notice, Contractor shall provide a copy of the notice to Owner, Engineer, and each other insured under the policy.

4. remain in effect at least until final payment (and longer if expressly required in this Article) and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract Documents.

5. be appropriate for the Work being performed and provide protection from claims that may arise out of or result from Contractor’s performance of the Work and Contractor’s other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable.

J. The coverage requirements for specific policies of insurance must be met by such policies, and not by reference to excess or umbrella insurance provided in other policies.

6.04 Owner’s Liability Insurance

A. In addition to the insurance required to be provided by Contractor under Paragraph 6.03, Owner, at Owner’s option, may purchase and maintain at Owner’s expense Owner’s own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

B. Owner’s liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner’s liability policies for any of Contractor’s obligations to the Owner, Engineer, or third parties.

6.05 Property Insurance

A. Builder’s Risk: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder’s risk insurance upon the Work on a completed value basis, in the amount of the full insurable replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:
1. include the Owner and Contractor as named insureds, and all Subcontractors, and any
  individuals or entities required by the Supplementary Conditions to be insured under
  such builder’s risk policy, as insureds or named insureds. For purposes of the
  remainder of this Paragraph 6.05, Paragraphs 6.06 and 6.07, and any corresponding
  Supplementary Conditions, the parties required to be insured shall collectively be
  referred to as “insureds.”

2. be written on a builder’s risk “all risk” policy form that shall at least include insurance
  for physical loss or damage to the Work, temporary buildings, falsework, and materials
  and equipment in transit, and shall insure against at least the following perils or causes
  of loss: fire; lightning; windstorm; riot; civil commotion; terrorism; vehicle impact;
  aircraft; smoke; theft; vandalism and malicious mischief; mechanical breakdown,
  boiler explosion, and artificially generated electric current; earthquake; volcanic
  activity, and other earth movement; flood; collapse; explosion; debris removal;
  demolition occasioned by enforcement of Laws and Regulations; water damage (other
  than that caused by flood); and such other perils or causes of loss as may be
  specifically required by the Supplementary Conditions. If insurance against mechanical
  breakdown, boiler explosion, and artificially generated electric current; earthquake;
  volcanic activity, and other earth movement; or flood, are not commercially available
  under builder’s risk policies, by endorsement or otherwise, such insurance may be
  provided through other insurance policies acceptable to Owner and Contractor.

3. cover, as insured property, at least the following: (a) the Work and all materials,
  supplies, machinery, apparatus, equipment, fixtures, and other property of a similar
  nature that are to be incorporated into or used in the preparation, fabrication,
  construction, erection, or completion of the Work, including Owner-furnished or
  assigned property; (b) spare parts inventory required within the scope of the Contract;
  and (c) temporary works which are not intended to form part of the permanent
  constructed Work but which are intended to provide working access to the Site, or to
  the Work under construction, or which are intended to provide temporary support for
  the Work under construction, including scaffolding, form work, fences, shoring,
  falsework, and temporary structures.

4. cover expenses incurred in the repair or replacement of any insured property
  (including but not limited to fees and charges of engineers and architects).

5. extend to cover damage or loss to insured property while in temporary storage at the
  Site or in a storage location outside the Site (but not including property stored at the
  premises of a manufacturer or Supplier).

6. extend to cover damage or loss to insured property while in transit.

7. allow for partial occupation or use of the Work by Owner, such that those portions of
  the Work that are not yet occupied or used by Owner shall remain covered by the
  builder’s risk insurance.

8. allow for the waiver of the insurer’s subrogation rights, as set forth below.

9. provide primary coverage for all losses and damages caused by the perils or causes of
  loss covered.
10. not include a co-insurance clause.
11. include an exception for ensuing losses from physical damage or loss with respect to any defective workmanship, design, or materials exclusions.
12. include performance/hot testing and start-up.
13. be maintained in effect, subject to the provisions herein regarding Substantial Completion and partial occupancy or use of the Work by Owner, until the Work is complete.

B. Notice of Cancellation or Change: All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 6.05 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured.

C. Deductibles: The purchaser of any required builder’s risk or property insurance shall pay for costs not covered because of the application of a policy deductible.

D. Partial Occupancy or Use by Owner: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder’s risk policy, or through Contractor) will provide notice of such occupancy or use to the builder’s risk insurer. The builder’s risk insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy; rather, those portions of the Work that are occupied or used by Owner may come off the builder’s risk policy, while those portions of the Work not yet occupied or used by Owner shall remain covered by the builder’s risk insurance.

E. Additional Insurance: If Contractor elects to obtain other special insurance to be included in or supplement the builder’s risk or property insurance policies provided under this Paragraph 6.05, it may do so at Contractor’s expense.

F. Insurance of Other Property: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, such as tools, construction equipment, or other personal property owned by Contractor, a Subcontractor, or an employee of Contractor or a Subcontractor, then the entity or individual owning such property item will be responsible for deciding whether to insure it, and if so in what amount.

6.06 Waiver of Rights

A. All policies purchased in accordance with Paragraph 6.05, expressly including the builder’s risk policy, shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any insureds thereunder, or against Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and
damages caused by, arising out of, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all Subcontractors, all individuals or entities identified in the Supplementary Conditions as insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner’s property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 6.06.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them.

D. Contractor shall be responsible for assuring that the agreement under which a Subcontractor performs a portion of the Work contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by builder’s risk insurance and any other property insurance applicable to the Work.

6.07 Receipt and Application of Property Insurance Proceeds

A. Any insured loss under the builder’s risk and other policies of insurance required by Paragraph 6.05 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder’s risk and other policies of insurance required by Paragraph 6.05 shall distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.

C. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the money so received applied on account thereof, and the Work and the cost thereof covered by Change Order, if needed.

ARTICLE 7 – CONTRACTOR’S RESPONSIBILITIES

7.01 Supervision and Superintendence

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.02 Labor; Working Hours

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner’s written consent, which will not be unreasonably withheld.

7.03 Services, Materials, and Equipment

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.

B. All materials and equipment incorporated into the Work shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and
guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.04 “Or Equals”

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or “or equal” item is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.

1. If Engineer in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer shall deem it an “or equal” item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:

   a. in the exercise of reasonable judgment Engineer determines that:

      1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

      2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;

      3) it has a proven record of performance and availability of responsive service; and

      4) it is not objectionable to Owner.

   b. Contractor certifies that, if approved and incorporated into the Work:

      1) there will be no increase in cost to the Owner or increase in Contract Times; and

      2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

B. Contractor’s Expense: Contractor shall provide all data in support of any proposed “or equal” item at Contractor’s expense.

C. Engineer’s Evaluation and Determination: Engineer will be allowed a reasonable time to evaluate each “or-equal” request. Engineer may require Contractor to furnish additional data about the proposed “or-equal” item. Engineer will be the sole judge of acceptability.
No “or-equal” item will be ordered, furnished, installed, or utilized until Engineer’s review is complete and Engineer determines that the proposed item is an “or-equal”, which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.

D. **Effect of Engineer’s Determination:** Neither approval nor denial of an “or-equal” request shall result in any change in Contract Price. The Engineer’s denial of an “or-equal” request shall be final and binding, and may not be reversed through an appeal under any provision of the Contract Documents.

E. **Treatment as a Substitution Request:** If Engineer determines that an item of material or equipment proposed by Contractor does not qualify as an “or-equal” item, Contractor may request that Engineer considered the proposed item as a substitute pursuant to Paragraph 7.05.

### 7.05 Substitutes

A. Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.

1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.

2. The requirements for review by Engineer will be as set forth in Paragraph 7.05.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:
   a. shall certify that the proposed substitute item will:
      1) perform adequately the functions and achieve the results called for by the general design,
      2) be similar in substance to that specified, and
      3) be suited to the same use as that specified.
   b. will state:
      1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
      2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other
direct contract with Owner for other work on the Project) to adapt the
design to the proposed substitute item, and

3) whether incorporation or use of the proposed substitute item in connection
with the Work is subject to payment of any license fee or royalty.

c. will identify:

1) all variations of the proposed substitute item from that specified, and

2) available engineering, sales, maintenance, repair, and replacement services.

d. shall contain an itemized estimate of all costs or credits that will result directly or
indirectly from use of such substitute item, including but not limited to changes in
Contract Price, shared savings, costs of redesign, and claims of other contractors
affected by any resulting change.

B. *Engineer’s Evaluation and Determination*: Engineer will be allowed a reasonable time to
evaluate each substitute request, and to obtain comments and direction from Owner.
Engineer may require Contractor to furnish additional data about the proposed substitute
item. Engineer will be the sole judge of acceptability. No substitute will be ordered,
furnished, installed, or utilized until Engineer’s review is complete and Engineer determines
that the proposed item is an acceptable substitute. Engineer’s determination will be
evidenced by a Field Order or a proposed Change Order accounting for the substitution
itself and all related impacts, including changes in Contract Price or Contract Times.
Engineer will advise Contractor in writing of any negative determination.

C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor’s expense a
special performance guarantee or other surety with respect to any substitute.

D. *Reimbursement of Engineer’s Cost*: Engineer will record Engineer’s costs in evaluating a
substitute proposed or submitted by Contractor. Whether or not Engineer approves a
substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for
the reasonable charges of Engineer for evaluating each such proposed substitute.
Contractor shall also reimburse Owner for the reasonable charges of Engineer for making
changes in the Contract Documents (or in the provisions of any other direct contract with
Owner) resulting from the acceptance of each proposed substitute.

E. *Contractor’s Expense*: Contractor shall provide all data in support of any proposed
substitute at Contractor’s expense.

F. *Effect of Engineer’s Determination*: If Engineer approves the substitution request,
Contractor shall execute the proposed Change Order and proceed with the substitution.
The Engineer’s denial of a substitution request shall be final and binding, and may not be
reversed through an appeal under any provision of the Contract Documents. Contractor
may challenge the scope of reimbursement costs imposed under Paragraph 7.05.D, by
timely submittal of a Change Proposal.

7.06 **Concerning Subcontractors, Suppliers, and Others**

A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the
Work. Such Subcontractors and Suppliers must be acceptable to Owner.
B. Contractor shall retain specific Subcontractors, Suppliers, or other individuals or entities for the performance of designated parts of the Work if required by the Contract to do so.

C. Subsequent to the submittal of Contractor’s Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against which Contractor has reasonable objection.

D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable, during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within five days.

E. Owner may require the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors, Suppliers, or other individuals or entities for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor, Supplier, or other individual or entity so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity.

F. If Owner requires the replacement of any Subcontractor, Supplier, or other individual or entity retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, or both, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner’s requirement of replacement.

G. No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

H. On a monthly basis Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.

I. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor’s own acts and omissions.

J. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors, Suppliers, and all other individuals or entities performing or furnishing any of the Work.

K. Contractor shall restrict all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work from communicating with Engineer or Owner,
except through Contractor or in case of an emergency, or as otherwise expressly allowed herein.

L. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

M. All Work performed for Contractor by a Subcontractor or Supplier shall be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer.

N. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor on account of Work performed for Contractor by the particular Subcontractor or Supplier.

O. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier, or other individual or entity; nor

2. shall create any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

7.07 Patent Fees and Royalties

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.

C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and
against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.08 **Permits**

A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor’s Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.09 **Taxes**

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.10 **Laws and Regulations**

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor’s compliance with any Laws or Regulations.

B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It shall not be Contractor’s responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor’s obligations under Paragraph 3.03.

C. Owner or Contractor may give notice to the other party of any changes after the submission of Contractor’s Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.
7.11 Record Documents

A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.12 Safety and Protection

A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:

1. all persons on the Site or who may be affected by the Work;
2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify Owner; the owners of adjacent property, Underground Facilities, and other utilities; and other contractors and utility owners performing work at or adjacent to the Site, when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.

C. Contractor shall comply with the applicable requirements of Owner’s safety programs, if any. The Supplementary Conditions identify any Owner’s safety programs that are applicable to the Work.

D. Contractor shall inform Owner and Engineer of the specific requirements of Contractor’s safety program with which Owner’s and Engineer’s employees and representatives must comply while at the Site.

E. All damage, injury, or loss to any property referred to in Paragraph 7.12.A.2 or 7.12.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of
Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

F. Contractor’s duties and responsibilities for safety and protection shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 15.06.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

G. Contractor’s duties and responsibilities for safety and protection shall resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.13 Safety Representative
A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

7.14 Hazard Communication Programs
A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 Emergencies
A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

7.16 Shop Drawings, Samples, and Other Submittals
A. Shop Drawing and Sample Submittal Requirements:
   1. Before submitting a Shop Drawing or Sample, Contractor shall have:
      a. reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
      b. determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
c. determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and 

d. determined and verified all information relative to Contractor’s responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor’s obligations under the Contract Documents with respect to Contractor’s review of that submittal, and that Contractor approves the submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review and approval of each such variation.

B. Submittal Procedures for Shop Drawings and Samples: Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals. Each submittal will be identified as Engineer may require.

1. Shop Drawings:
   a. Contractor shall submit the number of copies required in the Specifications.
   b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.D.

2. Samples:
   a. Contractor shall submit the number of Samples required in the Specifications.
   b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 7.16.D.

3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer’s review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. Other Submittals: Contractor shall submit other submittals to Engineer in accordance with the accepted Schedule of Submittals, and pursuant to the applicable terms of the Specifications.
D. Engineer’s Review:

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer’s review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer’s review and approval will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.

3. Engineer’s review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

4. Engineer’s review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will document any such approved variation from the requirements of the Contract Documents in a Field Order.

5. Engineer’s review and approval of a Shop Drawing or Sample shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 7.16.A and B.

6. Engineer’s review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

7. Neither Engineer’s receipt, review, acceptance or approval of a Shop Drawing, Sample, or other submittal shall result in such item becoming a Contract Document.

8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.D.4.

E. Resubmittal Procedures:

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

2. Contractor shall furnish required submittals with sufficient information and accuracy to obtain required approval of an item with no more than three submittals. Engineer will record Engineer’s time for reviewing a fourth or subsequent submittal of a Shop Drawings, sample, or other item requiring approval, and Contractor shall be
responsible for Engineer’s charges to Owner for such time. Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges.

3. If Contractor requests a change of a previously approved submittal item, Contractor shall be responsible for Engineer’s charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

7.17 Contractor’s General Warranty and Guarantee

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its officers, directors, members, partners, employees, agents, consultants, and subcontractors shall be entitled to rely on Contractor’s warranty and guarantee.

B. Contractor’s warranty and guarantee hereunder excludes defects or damage caused by:
   1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
   2. normal wear and tear under normal usage.

C. Contractor’s obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor’s obligation to perform the Work in accordance with the Contract Documents:
   1. observations by Engineer;
   2. recommendation by Engineer or payment by Owner of any progress or final payment;
   3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
   4. use or occupancy of the Work or any part thereof by Owner;
   5. any review and approval of a Shop Drawing or Sample submittal;
   6. the issuance of a notice of acceptability by Engineer;
   7. any inspection, test, or approval by others; or
   8. any correction of defective Work by Owner.

D. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract shall govern with respect to Contractor’s performance obligations to Owner for the Work described in the assigned contract.

7.18 Indemnification

A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and
against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable.

B. In any and all claims against Owner or Engineer or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers’ compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 7.18.A shall not extend to the liability of Engineer and Engineer’s officers, directors, members, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

7.19 Delegation of Professional Design Services

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor’s responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable Laws and Regulations.

B. If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional’s written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, or approvals performed by such design
professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this paragraph, Engineer’s review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer’s review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 7.16.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria specified by Owner or Engineer.

ARTICLE 8 – OTHER WORK AT THE SITE

8.01 Other Work

A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner’s employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.

B. If Owner performs other work at or adjacent to the Site with Owner’s employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any utility work at or adjacent to the Site, Owner shall provide such information to Contractor.

C. Contractor shall afford each other contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner’s employees, proper and safe access to the Site, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

D. If the proper execution or results of any part of Contractor’s Work depends upon work performed by others under this Article 8, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor’s Work. Contractor’s failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor’s Work except for latent defects and deficiencies in such other work.
8.02 Coordination

A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner’s employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:

1. the identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;

2. an itemization of the specific matters to be covered by such authority and responsibility; and

3. the extent of such authority and responsibilities.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 Legal Relationships

A. If, in the course of performing other work at or adjacent to the Site for Owner, the Owner’s employees, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment shall take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract. When applicable, any such equitable adjustment in Contract Price shall be conditioned on Contractor assigning to Owner all Contractor’s rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor’s entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor’s ability to complete the Work within the Contract Times.

B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due to Contractor, and assign to such other contractor or utility owner the Owner’s contractual rights against Contractor with respect to the breach of the obligations set forth in this paragraph.

C. When Owner is performing other work at or adjacent to the Site with Owner’s employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of
Contractor’s failure to take reasonable and customary measures with respect to Owner’s other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due to Contractor.

D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor’s failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor’s actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER’S RESPONSIBILITIES

9.01 Communications to Contractor
   A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 Replacement of Engineer
   A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer’s status under the Contract Documents shall be that of the former Engineer.

9.03 Furnish Data
   A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 Pay When Due
   A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 Lands and Easements; Reports, Tests, and Drawings
   A. Owner’s duties with respect to providing lands and easements are set forth in Paragraph 5.01.
   B. Owner’s duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
   C. Article 5 refers to Owner’s identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.
9.06 Insurance
   A. Owner’s responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 Change Orders
   A. Owner’s responsibilities with respect to Change Orders are set forth in Article 11.

9.08 Inspections, Tests, and Approvals
   A. Owner’s responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 Limitations on Owner’s Responsibilities
   A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor’s means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor’s failure to perform the Work in accordance with the Contract Documents.

9.10 Undisclosed Hazardous Environmental Condition
   A. Owner’s responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 Evidence of Financial Arrangements
   A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner’s obligations under the Contract Documents (including obligations under proposed changes in the Work).

9.12 Safety Programs
   A. While at the Site, Owner’s employees and representatives shall comply with the specific applicable requirements of Contractor’s safety programs of which Owner has been informed.
   B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10 – ENGINEER’S STATUS DURING CONSTRUCTION

10.01 Owner’s Representative
   A. Engineer will be Owner’s representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner’s representative during construction are set forth in the Contract.

10.02 Visits to Site
   A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor’s executed Work. Based on information obtained during such
visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer’s efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer’s visits and observations are subject to all the limitations on Engineer’s authority and responsibility set forth in Paragraph 10.08. Particularly, but without limitation, during or as a result of Engineer’s visits or observations of Contractor’s Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor’s means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 Project Representative

A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 10.08. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer’s consultant, agent, or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

10.04 Rejecting Defective Work

A. Engineer has the authority to reject Work in accordance with Article 14.

10.05 Shop Drawings, Change Orders and Payments

A. Engineer’s authority, and limitations thereof, as to Shop Drawings and Samples, are set forth in Paragraph 7.16.

B. Engineer’s authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, are set forth in Paragraph 7.19.

C. Engineer’s authority as to Change Orders is set forth in Article 11.

D. Engineer’s authority as to Applications for Payment is set forth in Article 15.

10.06 Determinations for Unit Price Work

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.
10.07 **Decisions on Requirements of Contract Documents and Acceptability of Work**

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.08 **Limitations on Engineer’s Authority and Responsibilities**

A. Neither Engineer’s authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor’s means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor’s failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer’s review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 15.06.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.08 shall also apply to the Resident Project Representative, if any.

10.09 **Compliance with Safety Program**

A. While at the Site, Engineer’s employees and representatives will comply with the specific applicable requirements of Owner’s and Contractor’s safety programs (if any) of which Engineer has been informed.

**ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK**

11.01 **Amending and Supplementing Contract Documents**

A. The Contract Documents may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
1. **Change Orders:**
   a. If an amendment or supplement to the Contract Documents includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order. A Change Order also may be used to establish amendments and supplements of the Contract Documents that do not affect the Contract Price or Contract Times.
   
   b. Owner and Contractor may amend those terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, without the recommendation of the Engineer. Such an amendment shall be set forth in a Change Order.

2. **Work Change Directives:** A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive’s effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.04 regarding change of Contract Price. Contractor must submit any Change Proposal seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 30 days after the completion of the Work set out in the Work Change Directive. Owner must submit any Claim seeking an adjustment of the Contract Price or the Contract Times, or both, no later than 60 days after issuance of the Work Change Directive.

3. **Field Orders:** Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.02 **Owner- Authorized Changes in the Work**

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Such changes shall be supported by Engineer’s recommendation, to the extent the change involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters. Such changes may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work shall be performed under the applicable conditions of the Contract Documents. Nothing in this paragraph shall obligate Contractor to undertake work
that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor’s safety obligations under the Contract Documents or Laws and Regulations.

11.03 Unauthorized Changes in the Work

A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.

11.04 Change of Contract Price

A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment of Contract Price shall comply with the provisions of Article 12.

B. An adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.04.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor’s fee for overhead and profit (determined as provided in Paragraph 11.04.C).

C. Contractor’s Fee: When applicable, the Contractor’s fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
   a. for costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor’s fee shall be 15 percent;
   b. for costs incurred under Paragraph 13.01.B.3, the Contractor’s fee shall be five percent;
   c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.01.C.2.a and 11.01.C.2.b is that the Contractor’s fee shall be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.A.1 and 13.01.A.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of five percent of the
amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted work the maximum total fee to be paid by Owner shall be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the work;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor’s fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor’s fee shall be computed on the basis of the net change in accordance with Paragraphs 11.04.C.2.a through 11.04.C.2.e, inclusive.

11.05 Change of Contract Times

A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times shall comply with the provisions of Paragraph 11.06. Any Claim for an adjustment in the Contract Times shall comply with the provisions of Article 12.

B. An adjustment of the Contract Times shall be subject to the limitations set forth in Paragraph 4.05, concerning delays in Contractor’s progress.

11.06 Change Proposals

A. Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; appeal an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; contest a set-off against payment due; or seek other relief under the Contract. The Change Proposal shall specify any proposed change in Contract Times or Contract Price, or both, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents.

1. Procedures: Contractor shall submit each Change Proposal to Engineer promptly (but in no event later than 30 days) after the start of the event giving rise thereto, or after such initial decision. The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal. The supporting data shall be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event. Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal.

2. Engineer’s Action: Engineer will review each Change Proposal and, within 30 days after receipt of the Contractor’s supporting data, either deny the Change Proposal in whole, approve it in whole, or deny it in part and approve it in part. Such actions shall be in
writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer’s inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

3.  *Binding Decision:* Engineer’s decision will be final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.

B.  *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice shall be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.

11.07  **Execution of Change Orders**

A.  Owner and Contractor shall execute appropriate Change Orders covering:

1.  changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;

2.  changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;

3.  changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.02, (b) required because of Owner’s acceptance of defective Work under Paragraph 14.04 or Owner’s correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer’s recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise), or other engineering or technical matters; and

4.  changes in the Contract Price or Contract Times, or other changes, which embody the substance of any final and binding results under Paragraph 11.06, or Article 12.

B.  If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of this Paragraph 11.07, it shall be deemed to be of full force and effect, as if fully executed.

11.08  **Notification to Surety**

A.  If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor’s responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.
ARTICLE 12 – CLAIMS

12.01 Claims

A. **Claims Process:** The following disputes between Owner and Contractor shall be submitted to the Claims process set forth in this Article:

1. Appeals by Owner or Contractor of Engineer’s decisions regarding Change Proposals;
2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents; and
3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters.

B. **Submittal of Claim:** The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim shall rest with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, or both, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor’s knowledge and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

C. **Review and Resolution:** The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim shall be stated in writing and submitted to the other party, with a copy to Engineer.

D. **Mediation:**

1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate shall stay the Claim submittal and response process.
2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process shall resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process shall resume as of the date of the conclusion of the mediation, as determined by the mediator.
3. Owner and Contractor shall each pay one-half of the mediator’s fees and costs.

E. **Partial Approval:** If the party receiving a Claim approves the Claim in part and denies it in part, such action shall be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
F. **Denial of Claim:** If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim shall be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.

G. **Final and Binding Results:** If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim shall be incorporated in a Change Order to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

**ARTICLE 13 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

13.01 **Cost of the Work**

A. **Purposes for Determination of Cost of the Work:** The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:

1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or
2. To determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.

B. **Costs Included:** Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work shall be in amounts no higher than those prevailing in the locality of the Project, shall not include any of the costs itemized in Paragraph 13.01.C, and shall include only the following items:

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers’ compensation, health and retirement benefits, bonuses, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.
2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers’ field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor’s Cost of the Work and fee shall be determined in the same manner as Contractor’s Cost of the Work and fee as provided in this Paragraph 13.01.

4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:
   a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor’s employees incurred in discharge of duties connected with the Work.
   b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.
   c. Rentals of all construction equipment and machinery, and the parts thereof, whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.
   d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
   e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
   f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with
Paragraph 6.05), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor’s fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.

C. Costs Excluded: The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor’s officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor’s principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor’s fee.

2. Expenses of Contractor’s principal and branch offices other than Contractor’s office at the Site.

3. Any part of Contractor’s capital expenses, including interest on Contractor’s capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.

D. Contractor’s Fee: When the Work as a whole is performed on the basis of cost-plus, Contractor’s fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor’s fee shall be determined as set forth in Paragraph 11.04.C.

E. Documentation: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.
13.02 Allowances

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. Cash Allowances: Contractor agrees that:
   1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
   2. Contractor’s costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. Contingency Allowance: Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

13.03 Unit Price Work

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor’s overhead and profit for each separately identified item.

D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer’s preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer’s written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of the following paragraph.

E. Within 30 days of Engineer’s written decision under the preceding paragraph, Contractor may submit a Change Proposal, or Owner may file a Claim, seeking an adjustment in the Contract Price if:
   1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement;
   2. there is no corresponding adjustment with respect to any other item of Work; and
3. Contractor believes that it is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price, and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 14 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

14.01 Access to Work

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction will have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor’s safety procedures and programs so that they may comply therewith as applicable.

14.02 Tests, Inspections, and Approvals

A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.

B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work shall be governed by the provisions of Paragraph 14.05.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:

1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;

2. to attain Owner’s and Engineer’s acceptance of materials or equipment to be incorporated in the Work;

3. by manufacturers of equipment furnished under the Contract Documents;

4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and

5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor’s purchase thereof for incorporation in the Work.
Such inspections and tests shall be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.

F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering shall be at Contractor’s expense unless Contractor had given Engineer timely notice of Contractor’s intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 Defective Work

A. Contractor’s Obligation: It is Contractor’s obligation to assure that the Work is not defective.

B. Engineer’s Authority: Engineer has the authority to determine whether Work is defective, and to reject defective Work.

C. Notice of Defects: Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.

D. Correction, or Removal and Replacement: Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.

E. Preservation of Warranties: When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner’s special warranty and guarantee, if any, on said Work.

F. Costs and Damages: In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs, losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 Acceptance of Defective Work

A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer’s confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner’s evaluation of and determination to accept such defective Work (such costs to be approved
by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work shall be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05  Uncovering Work

A.  Engineer has the authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.

B.  If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer’s observation, and then replace the covering, all at Contractor’s expense.

C.  If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer’s request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.

1.  If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor’s full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.

2.  If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06  Owner May Stop the Work

A.  If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.
14.07 Owner May Correct Defective Work

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace rejected Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, then Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor’s services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner’s representatives, agents and employees, Owner’s other contractors, and Engineer and Engineer’s consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.

C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor’s defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner’s rights and remedies under this Paragraph 14.07.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 Progress Payments

A. Basis for Progress Payments: The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.

B. Applications for Payments:

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens, and evidence that the materials and equipment are covered by
appropriate property insurance, a warehouse bond, or other arrangements to protect Owner’s interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor’s legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. Review of Applications:

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer’s reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer’s recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer’s observations of the executed Work as an experienced and qualified design professional, and on Engineer’s review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer’s knowledge, information and belief:
   a. the Work has progressed to the point indicated;
   b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
   c. the conditions precedent to Contractor’s being entitled to such payment appear to have been fulfilled in so far as it is Engineer’s responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
   a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
   b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.
4. Neither Engineer’s review of Contractor’s Work for the purposes of recommending payments nor Engineer’s recommendation of any payment, including final payment, will impose responsibility on Engineer:
   a. to supervise, direct, or control the Work, or
   b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or
   c. for Contractor’s failure to comply with Laws and Regulations applicable to Contractor’s performance of the Work, or
   d. to make any examination to ascertain how or for what purposes Contractor has used the money paid on account of the Contract Price, or
   e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer’s opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.

6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer’s opinion to protect Owner from loss because:
   a. the Work is defective, requiring correction or replacement;
   b. the Contract Price has been reduced by Change Orders;
   c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
   d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
   e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. Payment Becomes Due:

1. Ten days after presentation of the Application for Payment to Owner with Engineer’s recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. Reductions in Payment by Owner:

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
   a. claims have been made against Owner on account of Contractor’s conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages on account of Contractor’s conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from
workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;

c. Contractor has failed to provide and maintain required bonds or insurance;

d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;

e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;

f. the Work is defective, requiring correction or replacement;

g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;

h. the Contract Price has been reduced by Change Orders;

i. an event that would constitute a default by Contractor and therefore justify a termination for cause has occurred;

j. liquidated damages have accrued as a result of Contractor’s failure to achieve Milestones, Substantial Completion, or final completion of the Work;

k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

l. there are other items entitling Owner to a set off against the amount recommended.

2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed shall be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.

3. Upon a subsequent determination that Owner’s refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 15.01.C.1 and subject to interest as provided in the Agreement.

15.02 Contractor’s Warranty of Title

A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title
defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than seven days after the time of payment by Owner.

15.03 Substantial Completion

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which shall fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.

E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.

F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.
15.04 Partial Use or Occupancy

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor’s performance of the remainder of the Work, subject to the following conditions:

1. At any time Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through E for that part of the Work.

2. At any time Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.05 regarding builder’s risk or other property insurance.

15.05 Final Inspection

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 Final Payment

A. Application for Payment:

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.11), and other documents, Contractor may make application for final payment.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
   a. all documentation called for in the Contract Documents;
   b. consent of the surety, if any, to final payment;
   c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.
   d. a list of all disputes that Contractor believes are unsettled; and
   e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.

B. Engineer’s Review of Application and Acceptance:
   1. If, on the basis of Engineer’s observation of the Work during construction and final inspection, and Engineer’s review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor’s other obligations under the Contract have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer’s recommendation of final payment and present the Application for Payment to Owner for payment. Such recommendation shall account for any set-offs against payment that are necessary in Engineer’s opinion to protect Owner from loss for the reasons stated above with respect to progress payments. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to the provisions of Paragraph 15.07. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. Completion of Work: The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer’s written recommendation of final payment.
D. **Payment Becomes Due**: Thirty days after the presentation to Owner of the final Application for Payment and accompanying documentation, the amount recommended by Engineer (less any further sum Owner is entitled to set off against Engineer’s recommendation, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions above with respect to progress payments) will become due and shall be paid by Owner to Contractor.

15.07 **Waiver of Claims**

A. The making of final payment will not constitute a waiver by Owner of claims or rights against Contractor. Owner expressly reserves claims and rights arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 15.05, from Contractor’s failure to comply with the Contract Documents or the terms of any special guarantees specified therein, from outstanding Claims by Owner, or from Contractor’s continuing obligations under the Contract Documents.

B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted or appealed under the provisions of Article 17.

15.08 **Correction Period**

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents, or by any specific provision of the Contract Documents), any Work is found to be defective, or if the repair of any damages to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas used by Contractor as permitted by Laws and Regulations, is found to be defective, then Contractor shall promptly, without cost to Owner and in accordance with Owner’s written instructions:

1. correct the defective repairs to the Site or such other adjacent areas;
2. correct such defective Work;
3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and
4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner’s written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others).

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item
may start to run from an earlier date if so provided in the Specifications.

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor’s obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

16.01 Owner May Suspend Work

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension. Any Change Proposal seeking such adjustments shall be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 Owner May Terminate for Cause

A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:

1. Contractor’s persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule);
2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
3. Contractor’s disregard of Laws or Regulations of any public body having jurisdiction; or
4. Contractor’s repeated disregard of the authority of Owner or Engineer.

B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) ten days written notice that Owner is considering a declaration that Contractor is in default and termination of the contract, Owner may proceed to:

1. declare Contractor to be in default, and give Contractor (and any surety) notice that the Contract is terminated; and
2. enforce the rights available to Owner under any applicable performance bond.

C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the
Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.

D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within seven days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.

E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

F. Where Contractor’s services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.

G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond shall govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 Owner May Terminate For Convenience

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and

3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.

B. Contractor shall not be paid on account of loss of anticipated overhead, profits, or revenue, or other economic loss arising out of or resulting from such termination.
16.04 Contractor May Stop Work or Terminate

A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor’s stopping the Work as permitted by this paragraph.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

17.01 Methods and Procedures

A. Disputes Subject to Final Resolution: The following disputed matters are subject to final resolution under the provisions of this Article:

1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full; and

2. Disputes between Owner and Contractor concerning the Work or obligations under the Contract Documents, and arising after final payment has been made.

B. Final Resolution of Disputes: For any dispute subject to resolution under this Article, Owner or Contractor may:

1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions; or

2. agree with the other party to submit the dispute to another dispute resolution process; or

3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.
ARTICLE 18 – MISCELLANEOUS

18.01 Giving Notice
   A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:
      1. delivered in person, by a commercial courier service or otherwise, to the individual or to a member of the firm or to an officer of the corporation for which it is intended; or
      2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the sender of the notice.

18.02 Computation of Times
   A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 Cumulative Remedies
   A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph 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.

18.04 Limitation of Damages
   A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 No Waiver
   A. A party's non-enforcement of any provision shall not constitute a waiver of that provision, nor shall it affect the enforceability of that provision or of the remainder of this Contract.

18.06 Survival of Obligations
   A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

18.07 Controlling Law
   A. This Contract is to be governed by the law of the state in which the Project is located.
18.08 Headings

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.
SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 specification sections, apply to this section.

1.2 LOCATION OF WORK

A. The work for the Contract is located in the Town of Nahant on Walton Street, and Furbush Street. The base bid work consists of the installation of approximately 1,170 linear feet of 8-inch water main. Bid alternative work is located on Mills Terrance and Howe Road and includes an additional 690 linear feet of 8-inch water main.

1.3 SCOPE OF WORK

A. Furnish all labor, materials, equipment and incidentals to remove and replace the existing water main and appurtenances complete and ready for operation as indicated on the Drawings and specified herein.

B. A general description of the Work to be performed under this Contract shall include, but will not be limited to the following construction operations:

1. Furnish and install project signs, traffic cones, road closure barriers and other miscellaneous traffic control devices as required.

2. Prepare notifications in cooperation with the Town of Nahant.


4. Furnish, install and maintain all required sedimentation barriers and other items required to comply with the requirements specified hereinafter by the Conservation Commission and/or Engineer.

5. Furnish and install temporary water by-pass piping. Coordinate with local water department and fire department for use of by-pass system with hydrants and installation of approved pressure reducing valves.

6. Grading, excavating, filling, backfilling and compacting for pipe laying, and for resurfacing.
7. Furnish and install all water pipes, fittings, hydrants, valves, services and connections to existing mains, complete, including necessary appurtenances and service fittings.

8. Removal or abandonment of existing fittings and pipes as required.

9. Disposal of excess geotechnically unsuitable excavated material.

10. Reuse of geotechnically suitable excavated material on site as backfill and dispose of excess material from excavation not required for fill or backfill as specified, and to the satisfaction of the Owner.

11. Perform testing and disinfection of water main and correct all failures, leaks and/or breaks.

12. Reconnection of existing services which connect the Work of this Contract as required.

13. Perform required roadway paving operations.

14. Restore all signs, pavement markings, fences, walls, drives, curb lines, concrete sidewalks, berms, lawns, shrubbery, and landscaping disturbed during water main installation work.

C. The work shall conform to such additional drawings, specifications and addenda to these Specifications and Drawings as may be published or exhibited prior to the opening of Bid Proposals or as may be furnished by the Engineer from time to time during the construction.

D. Work and materials which are necessary in the construction but which are not specifically referred to in the Specification, or shown on the Drawings, but implied by the Contract shall be furnished by the Contractor and included in the Contractor’s Unit and Lump Sum Prices Bid. The work and materials shall be such as will correspond with the general character of the work as may be determined by the Engineer, whose decisions as to the necessity for and character of such work and materials shall be final and conclusive. It is the intent of these specifications to produce a complete, finished job whether shown in every detail or not.

E. For the purposes of this Contract, anywhere the term “Temporary” is used in the Specifications, in the Plans, in Contract Addenda, in any revisions made to the Contract Documents at any time prior to or during construction, verbally, in writing, in change orders or work change directives or at any other time whether listed here or not, it shall be taken to mean “Temporary” only as it relates to the duration of the Contract. All repairs, restoration, and construction shall be considered permanent.
1.2 CONSTRUCTION SEQUENCE

Inclusion of the following sequencing restrictions does not relieve the Contractor from its responsibility to complete the Work with the specified contract duration, nor does it relieve the Contractor from its responsibility to sequence and carry out the work so as not to cause harm to the existing systems, environment, or community.

A. Establish baseline Sedimentation and Erosion Control
B. Mobilization
C. Establish advance warning Traffic Management
D. Layout of site work and survey control
E. Installation of temporary water by-pass piping
F. Prior to installation of the Work the Contractor shall verify the relocation of any existing utilities that are scheduled for relocation, coordinate with the responsible utility, and relocate those utilities which are the Contractor’s responsibility as per these Contract Documents.
G. Replacement and installation of new main.
H. Connect to existing mains where required.
I. Pressure test and disinfect new main.
J. Install new service lines, curb stops and hydrants as required.
K. Connect existing services to new lines.
L. Tie over existing side street connections

1.3 UNDERGROUND UTILITIES

A. The underground utilities shown on the plans have been located primarily from information furnished by others and are considered approximate both as to size and location. There may be additional utilities to be encountered that are not shown on the plans, and it shall be the Contractor's responsibility to locate all existing utilities and to protect same from damage or harm. All utilities interfered with or damaged shall be properly restored, at the expense of the Contractor, as required by Owner. Unapproved service interruptions will not be allowed. Refer to Specification Section 01200 for additional utility coordination information and requirements.
1.4 SURFACE RESTORATION

A. Any damage to the pavement, curbing, or sidewalks outside of the limits of excavation and excavation support as defined in the Contract Documents shall be the responsibility of the Contractor and all costs associated with the repair of the excavation, sub-base, pavement, curbing, and sidewalks shall be fully borne by the Contractor. Repairs shall be immediately made by the Contractor as per the Contract Documents and as required by the Engineer.

1.5 HOURS OF WORK

A. The hours of work shall be Monday through Friday, 7:00 a.m. – 4:00 p.m. excluding Town of Nahant Holidays. For additional hours restrictions, refer to Specification Section 01063 – Sequencing of Work.

B. During non-work hours (4:00 p.m. – 7:00 a.m. weekdays; weekends and holidays), the Contractor shall make the following provisions:

1. Access to all properties shall be maintained. Work zones shall be clean, protected and safe. The Contractor shall minimize the amount of parking restrictions.

2. At the end of each work day, the Contractor shall backfill or place steel road plates over all excavations so as to maintain emergency vehicle and pedestrian traffic access and flow. Under no circumstances will open excavations be allowed during non-work hours. All parking will be given back to the community and businesses during non-work hours. Work zones shall be cleaned, protected and made safe.

1.6 CONTRACTOR USE OF PROJECT SITE

A. The Contractor’s use of the project site shall be limited to its construction operations, including on-site storage of materials, and on-site fabrication facilities.

B. The Contractor shall determine the location(s) of the staging area(s) to be used for this project and shall obtain approval of the location(s) from the Town of Nahant prior to any mobilization activities. The Contractor shall not store equipment or materials on private properties, without prior negotiations with the property owner.

C. The Contractor shall maintain access to street parking and driveway parking and access to all properties and businesses outside the work zone during off work hours.
1.7 LIST OF DRAWINGS

A. The location, general characteristics, and principal details of the work are indicated on a set of drawings entitled “Town of Nahant 2020 Water Main Improvements”.

B. The drawings stated above are the Contract Drawings, sometimes referred to herein as the "Drawings." Additional drawings showing details in accordance with which the work is to be done may be furnished from time to time by the Engineer, if found necessary, and shall then become a part of the Drawings.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01010
SECTION 01025
MEASUREMENT AND PAYMENT

PART 1 — GENERAL

1.1 SUMMARY

A. Payment for the items specified in the Bid Schedule shall include compensation for furnishing all labor, tools, equipment, supplies, and manufactured articles, and for all operations, and incidentals appurtenant to the items of work described, to complete the various items of the Work, all in accordance with the requirements of the Contract Documents, Drawings, Specifications, Addendum, and other modifications issued and approved by the Owner and Engineer.

B. Payment for the items specified in the Bid Schedule shall include all costs for permits and compliance with the regulations of public agencies having jurisdiction including Safety and Health Requirements of the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA).

C. The bid prices listed in the Bid Schedule shall include all Work items described or implied in the Contract Documents, Drawings, Specifications, Addendum, and other modifications issued and approved by the Owner and Engineer, and all other Work items necessary to manufacture, furnish, install and test a complete working project.

D. The following items are considered “Incidental” to the completion of the Work included in this Contract. These incidental work items shall be included in the Bid Schedule prices and are not included for separate payment. The incidental work items include, but are not limited to:

   a. Abandonment, removal and disposal of existing, abandoned or relocated private utilities not specified for payment elsewhere
   
   b. Construction photographs
   
   c. Attending Owner meetings, neighborhood meetings, and all other Construction meetings
   
   d. Preparation of notifications in cooperation with the Town and distribution to residents’ 1-week in advance of work.
   
   e. Submitting work plans, shop drawings, and materials samples.
   
   f. Protection of installed materials from damage, and replacement of damaged materials as directed by the Engineer.
g. Warrantees and Guarantees as indicated in the Contract Documents.

h. Maintenance of plant materials as indicated in the Contract Documents.

i. Dust control and air quality monitoring for dust and total volatile organic compounds. For any confined space entry air quality monitoring for methane, hydrogen sulfide, % Lower Explosive limit, and oxygen levels will be required.

j. Street sweeping, including power sweeping as required.

k. Removal of snow from streets and sidewalks where work is ongoing

l. Transporting trash and recyclables out of the work area where municipal pickup is hindered

m. Providing certificates of design where required

n. Developing and submitting Construction Progress schedule, monthly schedule updates, and weekly construction schedule projections and updates

o. Fulfilling all reporting requirements

p. Clean-up and restoration of all surface features not included for payment elsewhere.

q. Obtain all permits including payment of fees

r. Demolition and Removal of Pipe

s. Permanent Bulkheads for Pipe Abandonment

t. Furnishing and installing fittings for storm drain installation

u. Furnishing and Placing Backfill by one of the approved methods listed below:

1. Reuse excavated material, if suitable, immediately on site at the general area of excavation.

2. Furnish and install imported suitable backfill

3. Transport the material to a staging area, stage and protect the material, load the material, transport the material to be used as backfill at the general area of excavation.
v. Furnishing, installing, compacting and testing gravel sub-base by one of the approved methods listed below:

1. Reuse excavated sub-base material, if suitable, immediately on site at the general area of excavation, as sub-base material

2. Furnish and install imported suitable gravel sub-base

3. Transport the material to a staging area, stage and protect the material, load the material, transport the material to be used as sub-base at the general area of excavation.

w. Remove and reset all signs and sign posts, meters, trash receptacles, or any other site feature or furnishing not specifically listed for separate payment elsewhere.

x. Protection of private property outside the limit of work including walls at the back of sidewalk.

y. Furnish and install loam, seed, and mulch at locations of disturbed areas.

z. Rodent control.

E. No separate payment shall be made for any item that is not specifically specified in the Bid Schedule, and all costs therefore shall be included in the prices named in the Bid Schedule for the various appurtenant items of work.

F. The Contractor and Subcontractors shall not take advantage of any apparent error or omission on the Drawings or in the Specifications. The Contractor and Subcontractors shall make corrections and interpretations as may be deemed necessary for fulfillment of the intent of the Contract Documents at no additional cost to the Owner.

G. Anywhere in these Contract Documents, the term furnish shall mean manufacture; supply; delivery to the Project site including the actual unloading and unpacking; assembly; erection; placing; installation; anchoring; applying; working to dimension; finishing; curing; protecting; cleaning; testing; start-up; and similar operations unless stated otherwise.

H. Requests for changes to the unit prices for the quantities indicated will not be considered unless the actual final quantity is less than 85% or more than 115% of the quantity of the bid. Requests for changes to the unit prices bid must be fully documented and justified by the party (Contractor or Owner) making the request to be considered.
1.2 LUMP SUM ITEMS

A. Payment for the lump sums shall be full compensation for all labor, materials and equipment required to furnish, install, construct, startup and test the work covered under that lump sum item, whether listed in the related Compensation subsection for each item or not. All supervision; overhead items including but not limited to bonds, insurance, and labor burden; and profit are also included.

H. Payment shall fully compensate the Contractor for any other work which is not specified or shown, but which is necessary to complete the Work.

1.3 UNIT PRICE ITEMS

A. Unit prices shall be full compensation for all labor, materials and equipment required to furnish, install, construct, startup and test the work covered under that unit price item, whether listed in the related Compensation subsection for each item or not. All supervision; overhead items including but not limited to bonds, insurance, and labor burden; and profit are also included.

B. Payment shall fully compensate the Contractor for any other work which is not specified or shown, but which is necessary to complete the Work.

1.4 MEASUREMENT FOR PAYMENT

A. Work completed to date shall be submitted by the Contractor and substantiated as required by the Engineer.

B. The Owner and Engineer will review the submittal for completeness and verification. Failure to submit any of the below requirements will be grounds for a rejection of the submitted pay request until such time as the submittals are complete, accurate, up to date, and have been approved by the Owner and Engineer.

1. Include a checklist of completed items. Only items signed-off by the Engineer will be considered for payment.

2. Include red-lined “As-built” drawings indicating degree of completion, as described in Section 01200 – General Requirements for Utility Work.

3. Include a revised Construction Progress schedule and narrative as required in the Specifications and showing actual record information.
4. Include a copy of all required test results including, but not limited to geotechnical and settlement monitoring results, compaction test results, concrete strength test results, grain size analysis and analytical test results.

5. Certified payrolls for general and all sub-contractors.

1.5 ITEM DESCRIPTIONS

A. Item 1, Mobilization

1. Payment for Mobilization will be at lump sum price bid for this item in the proposal and shall be payable by percentage complete per the previous listed items when the Contractor is operational on the site. Operational is defined as the substantial commencement of work on site as described in the following paragraph. The Lump Sum price bid for mobilization shall not exceed 5 percent of the Total Amount of Bid.

2. Under the Lump Sum price bid for Mobilization, the Contractor shall move his equipment to the site and prepare to begin construction. Mobilization shall include all costs of initiating the Contract, exclusive of the cost of materials. Mobilization includes securing and constructing a staging area(s) for materials; furnishing and installing pre-construction traffic management signage; distributing contact numbers for Contractor’s staff to Owner and Engineer; submission and approval of initial shop drawings; submission and approval of Traffic Management Plans; submission and approval of initial work plans and sequencing plans; installing temporary power, lighting and water for construction purposes; implementing security feature; furnishing and installing temporary sanitary facilities; transporting all necessary trucks and construction equipment to the site necessary to begin construction; and all other work necessary to start Construction.

B. Item 2, Temporary Utility Support and Coordination

1. Measurement for payment for Temporary Utility Support and Coordination will be on a percent of the Lump Sum bid calculated by dividing the elapsed time to date by the contractual construction time limit as approved by the Engineer.

2. Payment for Temporary Utility Support and Coordination will be based on the bid for this item in the proposal. Under the Lump Sum Price bid for this item, the Contractor shall furnish all labor, materials, tools, equipment and incidentals required to maintain continuity of gas, telephone, electric, telecommunications, cable TV, steam, and privately
owned utilities. The work includes all trunk, supply, transmission, service, heat exchange pipelines and main lines impacted by the Work.

Under the Lump Sum Price bid for this item, the Contractor shall also furnish all labor, materials, tools, equipment and incidentals to coordinate and/or temporarily support all utilities exposed during the excavation for the installation of the Work; submission of all utility coordination and support work plans and shop drawings; coordinate the protection of and protect all overhead utilities; excavation and relocation of the electric conduit noted on the drawings in coordination with the electric company; and perform all coordination with the utility companies for the relocation, abandonment, protection, support, and other work required to facilitate the completion of the project. This Item further includes utility location (Dig Safe); provide, install, maintain, and disconnect portable generators to maintain electrical service to dwellings; coordination of construction with existing utility owners and operators; providing access for utility owners and operators to their respective utilities; coordination with the Town of Nahant; and communicating with affected homeowners and residents.

3. The following items are not included for payment under this item and are included for payment elsewhere; labor, materials, tools, equipment and incidentals required to maintain continuity of water mains; restoration of curbing, sidewalks, and bituminous concrete pavement.

C. Item 3, Quality Control and Testing

1. Payment will be made against the allowance based on invoices submitted by the General Contractor on a monthly basis. Labor, professional services, technician, and other invoices shall include a breakdown of hours, labor rates, direct expenses all sub-consultant and contractor mark-ups, material costs, shipping, taxes and all other costs included in the request. Incomplete or incorrect invoices will not be approved.

2. The General Contractor is allowed up to a 5% Mark-up on labor, professional service, technician, and other costs related to testing.

3. The allowance for this item shall be reimbursement to the General Contractor to furnish all labor, professional services, technician, equipment, and incidentals for testing required in this contract and not included in other pay items. The work includes, but is not limited to, testing for: backfill compaction, concrete and Hot Mix Asphalt standard paving compaction testing items.

4. Contamination, pipe and manhole testing, water main testing, test pits and all other testing not explicitly called out in this Section will not be paid for under this item and are covered under separate pay items.
D. Item 4, Sedimentation and Erosion Control

1. Payment for Sedimentation and Erosion Control will be based on the bid for this item in the proposal. Under the Unit Price bid for this item, the Contractor shall furnish all labor, materials, tools, equipment and incidentals required to furnish, install, maintain, relocate, and remove all sedimentation and erosion control measures. Under the Unit Price bid for this item, the Contractor shall also furnish all labor, materials, tools, equipment and incidentals to prepare and submit all work plans and submittals; line all existing catch basins with sediment filter devices, remove prior to inclement weather, and reinstall after inclement weather; install, maintain, and remove composting socks; install, maintain and remove temporary vegetation for erosion control; removal and disposal of all silt and sediment collected from sedimentation and erosion control measures; install, maintain and remove composting socks used for protection of porous paving media beds; removal and disposal of all silt and sediment collected from sedimentation and erosion control measures; and all other items of work not specifically included herein or elsewhere required to furnish, install, maintain, relocate, and remove sedimentation and erosion control devices as specified and required.

2. Measurement for payment for Sedimentation and Erosion Control will be on a percent of the Lump Sum bid calculated by dividing the elapsed time to date by the contractual construction time limit as approved by the Engineer.

E. Item 5, Test Pits

1. Measurement for payment for Test Pits will be based on the number of test pit excavations as required for confirmation of subsurface conditions and pipe locations, as indicated on the drawings and as approved by the Engineer. Test Pits completed for the Contractor’s convenience, not approved by the Engineer, will be at the Contractor’s expense and at no additional cost to the Owner.

2. Payment for Test Pit shall be based on the price per each pit excavated complete for this item in the proposal. Under the price per each for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for Test Pits. The work includes, but is not limited to; saw cutting bituminous and cement concrete; excavate and backfill such materials as necessary to locate pipe and water service and identify water service material and size as indicated on the Drawings, as required by the Owner or Engineer, or as approved by the Owner or Engineer prior to performing the test pit; temporary excavation support; furnishing and placing backfill per one of the approved methods; compaction and compaction testing;
coordination with utility companies/owners; and construction
dewatering and all work incidental thereto and all work not
specifically included for payment under other items.

3. Test Pits completed for the purpose of soil characterization shall not be
paid for under this item. Pre-trenching prior to the installation of
temporary support of excavation or for any other purpose shall not be
paid for herein unless approved by the Owner and Engineer prior to
the pre-trenching or test pitting.

F. Item 6, Temporary Bypass Water

1. Measurement for payment for Flow Bypass will be based on a percent
of the Lump Sum bid calculated by dividing the elapsed time to date
by the original Contractual construction time limit as approved by the
Engineer.

2. Payment for Temporary Bypass Water will be based on the Lump Sum
price bid for this item in the proposal. No measurement or payment
will be made for services from the temporary mains to the property
service connections. Payment shall be considered as full compensation
for furnishing all labor, equipment, materials, and services for
installing 2-inch, and 6-inch (minimum diameters) temporary water
lines for individual services; installing temporary bypass service hoses,
valves, and fittings; locating existing water services, excavating, and
connecting to the temporary service lines for all users whose water
service will be disrupted for more than 4-hours; providing temporary
fire protection at all hydrants which will be out of service for more
than 4-hours; constructing necessary trenches across streets and
driveways to protect temporary water lines; cold patch cover at
driveways; connections to existing hydrants where required; pressure
testing; providing water for pressure and leakage tests; disinfection
and dechlorination as specified; sampling; laboratory analyses;
emergency repairs and maintenance; removing all temporary water
lines, and restoring all property damaged or altered in the course of
providing temporary water; clean up; and all else incidental thereto,
for which separate payment is not provided under other items in the
Bid Proposal.

G. Item 7, Traffic Management

1. Under the unit price bid for this item, the Contractor shall furnish all
labor, materials, tools, equipment, and incidentals required to provide,
maintain, relocate, and remove Traffic Management and Control to
areas directly or indirectly influenced by construction within the limits
of work or outside the limits of work; along truck routes inside or
outside the limits of work; as delineated in the approved Traffic
Management Plan, by the MUTCD, ADA, and MHD standards; and as further directed by the Owner and Engineer. The work further includes, but is not limited to; obtaining permits; coordination with the Department of Public Works; coordination with private property owners within the limits of work; preparing, submitting, reviewing, implementing, and revising traffic management and control plans; furnishing, installing, and maintaining traffic management devices based on approved traffic management and control plans including precast concrete barriers with fencing and plywood panels, reflectorized drums, lane delineators, portable barricades, temporary crosswalks, and cones; temporary pavement markings; removal of temporary and existing pavement markings; furnishing, installing, pinning, maintaining, and removing steel road plates; ordering and coordinating police details; furnishing and installing temporary construction fencing; maintaining roadways and sidewalks inside or outside the limits of work; establishing and dismantling detours; covering existing traffic signs; obtaining, posting and maintaining “No Parking” signs; meeting with police details daily; coordinating police detail locations; and all incidental work, whether listed here or not, required to provide maintenance and protection of traffic and pedestrians.

2. Measurement for payment for Traffic Management will be on a percent of the Lump Sum bid calculated by dividing the elapsed time to date by the original Contractual construction time limit as approved by the Engineer.

H. Item 8, Water Mains (Item 8a through 8b):

1. Item 8a, 6” PVC Water Main;
2. Item 8b, 8” PVC Water Main;

i. Under the Unit Prices for this item, the Contractor shall furnish all labor, equipment, materials, tools and services for furnishing and installing C-900 PVC water main pipe. The unit prices shall also include all labor and materials required to make connections to existing mains and hydrants where required; couplings not included for payment elsewhere; test pits as necessary to locate existing utilities; saw cutting the roadway for trenches, removal and disposal of pavement, excavation, dewatering, backfill, protection, support or temporary removal and replacement of existing utilities and structures; compaction, excavation support, removal and disposal of existing water main (except for any asbestos cement pipe), fittings, valves and all services and appurtenances within proposed trench limits and as shown on Contract Documents; furnishing and installing Utility Marker
Tape; clearing and grubbing, stripping and stockpiling, furnishing and placing backfill and bedding material, filter fabric, leakage testing of the completed sewer; furnishing and placing controlled density fill, as needed; furnishing and placing the compacted gravel base on backfilled trenches under paved areas, repair and/or resetting of any utility lines broken; landscaping restoration including loam and seed, wetlands protection and restoration, removal and disposal of excess excavated material from the job, replacing sidewalk to existing conditions; restoring any wheel chair ramps to cement concrete ADA compliant wheel chair ramps; removing and resetting guardrails; removing and resetting vertical granite curb; removing and replacing curbing to existing conditions; clean up and all other appurtenant materials and work incidental thereto and not specifically included for payment under other items.

ii. The unit prices shall also include pressure testing; disinfection as specified; sampling; laboratory analyses; calcium chloride for dust control; returning physical features to their original condition; clean up; and all else incidental thereto, for which separate payment is not provided under other items in the Bid Proposal.

iii. Water main pipe will be measured for payment by the linear foot of water main installed, complete and accepted in place. Measurement will be along the water main centerline without deduction for valves and fittings. Hydrant branch lines will be measured from the center of the main line tee to the centerline of the hydrant.

I. Item 9, Valves and Boxes (Items 9a through 9b):

1. Item 9a, 6” Gate Valves & Boxes;
2. Item 9b, 8” Gate Valves & Boxes;
3. Item 9c, 1” Corporation Valve & Boxes;

i. The unit prices bid for these items shall be considered full compensation for furnishing all labor, equipment, materials, and services required or incidental for the satisfactory completion of the work.

ii. Measurement for payment for furnishing and installing valves with boxes will be made for each installed under these items.

J. Item 10, DI Fittings and Couplings:
1. The unit price bid for this Item shall be considered full compensation for furnishing all labor, equipment, materials and services for the satisfactory completion of the work.

2. Fittings, including solid sleeves and couplings, will be measured for payment by the pound actually installed in the completed project and accepted by the Engineer. Weight shall be based upon manufacturer catalog data and shipping weight slips furnished from the supplier to the Contractor. No payment will be allowed for weight of cement linings. No payment will be allowed for standard mechanical joint glands and accessories that are not used due to installation of restrained joints.

K. Item 11, Fire Hydrants and Appurtenances

1. Payment for furnishing and installing hydrants will be made for each installed under this Item. Payment will also be considered full compensation for furnishing all labor, equipment, and materials required for excavation and backfill, placing drain stone, pressure testing, disinfection, removal of excess excavated material, clean up and all else incidental thereto for the satisfactory completion of the work. All valve anchor tees, 6-inch gate valves and boxes, 6-inch PVC pipe, couplings, and mechanical joint restraints required for hydrant installation will be included for payment under their respective Items in the Proposal.

2. This item shall also include payment for removing and stacking of existing fire hydrants, furnishing safety flange repair kits, and furnishing and installing hydrant extension kits. Payment will be considered full compensation for furnishing all labor, equipment, and materials required for removing and disposing of existing fire hydrants and appurtenances, and the cost of all labor and materials required to install the safety flange repair and extension kits where directed by the Engineer.

L. Item 12, Water Services

1. Water services will be paid for at the unit price bid under this Item and payment will be considered full compensation for all labor, equipment, materials, and services necessary for installing 1-inch tubing including excavation, hole-hog work, dewatering, cutting or excavating existing sheeting, tracing wire, sheeting and shoring, trench boxes, sand bedding, backfill, compaction, gravel under paved areas; insulation; disposal of excess excavated materials; landscaping restoration including loam and seed, adapters, coordination with property owners, removing and
disposing of existing meters and flushing of the newly connected service lines and all else incidental for the satisfactory completion of the work.

2. This item shall also include furnishing and installing service taps, including corporation stops, fittings, saddles, and main tube shoes.

3. Water services to be paid for under this item will be measured for payment by the actual number of linear feet of water services, as specified, measured in place along the centerline of the pipe from the proposed water main to the property line as indicated on the standard details.

M. Item 13, Restraints
   1. Item 13a, Mechanical Joint Restraints
   2. Item 13b, Push-on Joint Restraints
      i. The number of mechanical and push on restrained joints to be paid for under this Item will be the number of restraints installed and accepted by the Engineer. Restraints installed for Contractor convenience shall not be paid for under this Item but are included for payment under the applicable division of Item 8 of the proposal. Payment shall include costs of all labor and materials required for installing restrained joints. No additional payment will be made for restrained joints.
      ii. Payment for furnishing and installing additional fittings required to do the work shall be paid for under the unit price bid in Item 10.

N. Item 14, PVC for Sewer/Drain Repair
   1. Under the Unit Price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required for repair of sewer and/or drains up to 12-inch diameter. The unit price shall also include all labor and materials required to make connections to existing sewers or drain, including installing flexible rubber couplings; all required transition couplings between PVC sewers and drains and other materials, removal and disposal of sewer or drain pipes (except for any asbestos cement pipe); leakage testing of the repair; clean up and all other appurtenant materials and work incidental thereto and not specifically included for payment under other items.
   2. The lengths of sewers to be paid for under this item shall be measured by the linear foot along the horizontal projection of the centerline of the completed sewer or drain repair.

O. Item 15, Abandon Existing Water Main Remaining in Place:
1. Under the Unit Price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to abandon the existing water main outside of the proposed trench limits as shown on the Contract Documents once all of the water services have been identified, isolated and transferred to the new water main.

2. The unit price under this item shall constitute full compensation for isolating the existing water main, cutting and capping the ends, closing existing valves and removing valve boxes, and removal and disposal of surplus material.

3. Measurement for payment will be on the basis of linear feet of water main abandoned in place.

P. Item 16, Rock Excavation:

1. Under the unit price bid, the Contractor shall excavate, remove, and dispose of rock and concrete from trenches and excavated areas. Included in the price bid per cubic yard shall be related costs such as drilling, blasting, blast monitoring, and replacement with suitable gravel material. Ledge and rock measured in place less than 1 cubic yard will not be measured for payment under this Item and will be considered earth excavation. Only ledge and rock that cannot be excavated with earth excavation equipment, in the opinion of the Engineer, shall be considered for measurement for payment under this Item. Excavated rock which has not been disposed of will not be included for payment. The unit price shall constitute full compensation for rock excavation and disposal, for all necessary backfilling and for furnishing all additional material needed for backfill.

2. Measurement for payment will be on the basis of cubic yards of rock excavated as measured by the Engineer. Depth of rock in pipe trenches will be measured from the rock surface to 6-inches below the invert of the pipe and the maximum width shall be determined as outlined in the Typical Trench Detail, included with the Contract Documents. Any rock excavated to a depth or width greater than the above shall be backfilled with gravel borrow at the Contractor’s expense. The pay limit for rock removal outside manholes will be one foot outside the widest dimension of the structure, two feet outside of concrete work for which forms are required, except footings, or the maximum trench width, whichever is greater.

Q. Item 17, Gravel Subbase

1. Under the unit price bid, the Contractor shall furnish and place gravel for use as subbase under pavement, as directed by the Engineer and not addressed in other bid items. Payment will not be made under this bid item for gravel placed under any other bid items.
2. Measurement for borrow will be made on the basis of cubic yards placed as approved by the Engineer.

R. Item 18, Hot Mix Asphalt – Base Course

1. Measurement for Payment for Hot Mix Asphalt – Base Course shall be based on the tons of base course and intermediate course placed complete, to a maximum width defined by the payment limits shown on the Contract Drawings, including cutbacks, or as required by the Engineer and as measured by the Engineer. Tonnage of pavement placed will be verified through calculation based on the actual thickness and roadway widths and lengths or the pavement thicknesses, widths, and lengths defined in the Contract, whichever is less. The formula for calculating the tonnage of pavement shall be W’ (trench width) x L’ (trench length) x D’ (pavement depth) x 0.075 ton/cf = tons. Calculated tonnage will be compared to the actual tonnage placed as submitted on pavement tonnage slips. If the tonnage calculated is greater than 10% lower than the tonnage on the pavement slips, the lesser tonnage shall be paid to the Contractor. Placement of pavement to excess thicknesses and outside the limits defined in the Contract Documents shall be at no additional cost to the Owner.

2. Payment for Hot Mix Asphalt - Base Course shall be based on the unit price bid for this item in the proposal. Under the unit price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to install hot mix asphalt base course, superpave base course, and superpave intermediate course to depth and width indicated within the payment limits, complete, as shown in the Contract Documents or at the requirements of the Engineer. The work includes, but is not limited to the following; removal of temporary paving; saw cutting, removal of existing pavement, and excavation of existing roadway subgrade for pavement cutbacks as shown on the drawings and specified; reusing, furnishing, placing, and compacting roadway subgrade to the cutback limits; raising and resetting existing structures, castings and boxes; installation and compaction of hot mix asphalt base course to the depth and width and in the area specified including cutbacks; hand placement and compaction of hot mix asphalt around structures, aprons, driveways and as required; power sweeping; keyways and other jointing between new and existing asphalt; furnish and place tack coat on all edges; and all incidental work not included for payment elsewhere.

3. Items not included for payment herein include, but are not limited to; hot mix asphalt for temporary paving; hot mix asphalt for permanent
top course; and pavement installed to replaced asphalt damaged by the Contractor.

S. Item 19, Hot Mix Asphalt – Top Course

1. Measurement for Payment for Hot Mix Asphalt – Top Course shall be based on the tons of top course placed complete, to a maximum width defined by the payment limits shown on the Contract Drawings, including cutbacks, or as required by the Engineer and as measured by the Engineer. Tonnage of pavement placed will be verified through calculation based on the actual thickness and roadway widths and lengths or the pavement thicknesses, widths, and lengths defined in the Contract, whichever is less. The formula for calculating the tonnage of pavement shall be \( W' \cdot L' \cdot D' \cdot 0.075 = \text{tons} \). Calculated tonnage will be compared to the actual tonnage placed as submitted on pavement tonnage slips. If the tonnage calculated is greater than 10% lower than the tonnage on the pavement slips, the lesser tonnage shall be paid to the Contractor. Placement of pavement to excess thicknesses and outside the limits defined in the Contract Documents shall be at no additional cost to the Owner.

2. Payment for Hot Mix Asphalt - Top Course shall be based on the unit price bid for this item in the proposal. Under the unit price for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidental required to install hot mix asphalt top course and superpave top course to depth and full roadway width, including cutbacks, complete and as shown in the Contract Documents or at the direction of the Engineer. The work includes, but is not limited to the following; installation and compaction of hot mix asphalt top course to the depth and width and in the area specified; hand placement and compaction of hot mix asphalt around structures, aprons, driveways and as required; power sweeping; keyways and other jointing between new and existing asphalt; furnish and place tack coat on all edges; and all incidental work not included for payment elsewhere.

3. Items not included for payment herein include but are not limited to; hot mix asphalt for temporary paving; hot mix asphalt for permanent base course; and pavement installed to replaced asphalt damaged by the Contractor.
PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01025
SECTION 01040

PROJECT COORDINATION

PART 1 – GENERAL

1.1 SUMMARY

A. This section includes general coordination requirements including preconstruction conference, site mobilization conference, and progress meetings.

1.2 CONTRACTOR COORDINATION

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

B. Coordinate completion of the Work and clean up for Substantial Completion and for portions of Work designated for Owner's partial utilization.

C. Coordinate access to site for correction of nonconforming Work to minimize disruption of Owner's activities where Owner is in partial utilization.

D. Contractor to provide a project manager for the duration of the project.

1.3 PRECONSTRUCTION CONFERENCE

A. The Owner will schedule a preconstruction conference.

B. Attendance Required: Owner’s representatives, Engineer, Contractor, Contractor’s Project Manager and Superintendent and major Subcontractors.

C. Sample Agenda:

1. Designation of personnel representing the parties in Contract and the Architect/Engineer.

2. Description of the Project background, purpose, basis of design and major elements of the Work.

3. Community Relations requirements
4. Soil and Waste Management requirements

5. Major Geotechnical requirements such as temporary support of excavation; backfill and compaction; geotechnical instrumentation and monitoring, and dewatering.

6. Requirements and procedures for the submission of change orders and pay requisitions.

7. Requirements, procedures and processing of shop drawings and other submittals; Schedules and schedule updates; substitutions; and Requests for Information.

8. Scheduling of the Work and coordination with other contractors.

9. Review of Subcontractors

10. Continuation of City services (trash and rubbish removal, recycling, street sweeping, dust control, tree protection, and snow removal).

11. Meeting requirements (Progress, Work Shops, etc.)

12. Utility coordination

13. Traffic and pedestrian management requirements

14. Other

1.4 PROGRESS MEETINGS

A. Project meetings shall be held at a location designated by the Owner and Engineers. Meetings shall be held at weekly intervals, or as required by the Owner or Engineer.

B. Attendance Required: Job superintendent, Contractor’s Project Manager, major Subcontractors and suppliers, Owner representatives, and Architect/Engineer as appropriate to agenda topics for each meeting.

C. The Owner or Engineer or their representative will make arrangements for meetings, and record minutes.

D. The Owner or Engineer or their representative will prepare the agenda and preside at meetings.
F. Contractor shall provide required information and be prepared to discuss each agenda item.

G. Sample Agenda:

1. Review minutes of previous meetings
2. Community Relations
3. Review of work progress. Review of work completed, work on going and work scheduled within the coming month.
4. Field observations, problems, and decisions
5. Identification of problems which impede planned progress
6. Review of submittals schedule and status of submittals
7. Review of RFI and RFP status
8. Proposed Change Orders (PCO), claims, credits, Work Change Directive, and change order status
9. Review of off-site fabrication and delivery schedules
10. Maintenance of progress schedule
11. Corrective measures to regain projected schedules
12. Maintenance of quality and work standards
13. Effect of proposed changes on progress schedule and coordination
14. Other item relating to Work

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01040
SECTION 01060

PERMITS AND REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1. RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2. RELATED SECTIONS

A. Section 00700 – General Conditions

1.3. REGULATORY AGENCIES

A. The Contractor shall comply with all laws, rules, and regulations and ordinances promulgated by any authority having jurisdiction over the Work.

B. The Contractor shall be fully responsible for obtaining and complying with all required permit(s). The Contractor shall be responsible for including all costs and fees required to obtain and comply with the permits, in the Bid. The Contractor shall ensure that all necessary permits from the Fire Department, Police Department, Public Works Department, Conservation Commission, Massachusetts Department of Environmental Protection, and all other regulatory agencies and/or inspectional authorities having jurisdiction are obtained and paid for by the Contractor or its subcontractor(s) as appropriate.

1.4. PERMITS OBTAINED BY THE CONTRACTOR

A. The Contractor or its subcontractor shall be responsible for obtaining, paying for, and complying with, as part of its base Bid, all permits; licenses; certifications; and approvals required for the work of this contract. The Contractor's responsibility includes but is not limited to, all permits required for his equipment, work force, and particular operations such as transportation and storage of fuel, chemicals or other materials and air emission.

B. At a minimum, the permits that the Contractor shall be responsible for obtaining, paying for, and complying with include, but are not limited to, the following:

1. Street Opening Permit
2. Trench Permit
C. The Contractor shall be responsible for scheduling and coordinating inspections and receipt of local, state, or federal permits/approvals/certifications for all Work as part of this Contract.

D. Comply with all the requirements of the Massachusetts Department of Environmental Protection, including, but not limited to DEP Backflow Prevention Permits.

1.3 PERMITS OBTAINED BY THE OWNER

A. The Conservation Commission has under the authority of Massachusetts General Laws Chapter 131, Section 40, issued an Order of Conditions on the work under this contract. This Order is to become a part of the Contract Documents and the Contractor shall perform all work in strict conformance with said Order. A copy of this Order is included in Appendix A of these Specifications.

B. All other permits including construction dewatering discharge permits are the responsibility of the Contractor.

B. The Contractor is solely responsible for the implementation of the permit requirements and shall include as such in the Bid.

C. The Contractor is solely responsible for any punitive action resulting from any violation of the permit.

D. Actual permits, issued by the respective agencies will be considered part of this Contract.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01060
SECTION 01063

MISCELLANEOUS REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

A. The Contractor shall conform to all miscellaneous requirements as herein specified.

1.3 TRAFFIC CONTROL

A. Contractor shall be solely responsible for traffic control.

B. For control of traffic, the Contractor shall provide an adequate number of traffic control devices employed at his own expense.

C. Whenever and wherever traffic is sufficiently congested, public safety is endangered, or as required by authorities having jurisdiction, furnish uniformed police officers to direct traffic and to keep traffic off the area affected by construction operations. Such officers shall be in addition to the traffic control requirements specified in other provisions of the contract.

D. The Contractor shall provide invoices for police details to the Department of Public Works for payment.

E. The use of traffic control devices or police shall in no way relieve the Contractor of any responsibility or liability which is his under the terms of the contract. Anticipated traffic control requirements for this project are expected to include cones, barrels, and signs. Owner reserves the right to require additional measures if police require them.
1.4 INTERFERENCE WITH EXISTING WORKS

A. The Contractor shall at all times conduct his operations so as to interfere as little as possible with existing works. The Contractor shall 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 possible 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. Before starting work which will interfere with the operation of existing facilities, the Contractor shall do all possible preparatory work and shall see that all tools, materials, and equipment are made ready and at hand.

The Contractor shall make such minor modifications in the work relating to existing structures as may be necessary, without additional compensation.

B. The Contractor shall have no claim for additional compensation by reason of delay or inconvenience in adapting his operations to meet the above requirements.

C. The Contractor shall have no claim for additional compensation by reason of delay or inconvenience in adapting his operations to the need for continuous flow of water.

1.5 BURIED UTILITY WARNING AND IDENTIFICATION TAPE

A. Provide detectable aluminum foil plastic backed tape or detectable magnetic plastic tape manufactured specifically for warning and identification of buried piping. Tape shall be detectable by an electronic detection instrument. Provide tape in rolls, 3 inches minimum width, color coded for the utility involved with warning and identification imprinted in bold black letters continuously and repeatedly over entire tape length. Warning and identification shall be CAUTION BURIED WATER PIPING BELOW or similar. Use permanent code and letter coloring unaffected by moisture and other substances contained in trench backfill material. Bury tape with the printed side up at a depth of 18 inches below the top surface of earth or the top surface of the subgrade under pavements.

1.6 WATERTIGHTNESS

A. All structures, pipes, and equipment which are to contain water shall be watertight under all operating conditions for which they are intended. The Contractor shall furnish all labor, materials and equipment and do all work required by the Engineer to make all such parts of the work watertight, or to replace them if in the opinion of the Engineer any leakage is excessive. All
such parts of the work filled with water for testing water tightness shall be left filled as ordered by the Engineer.

1.7 CARE OF WATERCOURSES

A. The Contractor shall maintain the flow in all watercourses, whether open channels or in pipes, in all sewers and other pipes interfered with in the line of work and convey the flow to a suitable point of discharge so as not to flow upon the work or create a nuisance. In the discharge of water removed from the excavations by pumping or by gravity similar precautions shall be observed.

1.8 FIRE HYDRANTS AND SPRINKLER CONNECTIONS

A. Fire hydrants on or adjacent to the work shall be kept operational and accessible to fire-fighting equipment at all times.

B. Contractor shall coordinate any required shutdown of fire sprinkler service lines with the Fire Department and the impacted property owner. Three days notice shall be provided to fire department and property owner prior to deactivating a fire sprinkler line.

PART 2 – PRODUCTS

2.1 TRAFFIC CONTROL DEVICES

A. Materials required for the work of this Section need not be new but must be in first-class condition and acceptable to the Owner. Any materials that in the judgment of the Owner are unsatisfactory in appearance or performance shall be removed and immediately replaced by acceptable units.

B. Signs, portable barricades, and drums shall have “Type III High Intensity Encapsulated Lens Reflective Sheeting” in accordance with Section M9.30.0 of the 1995 MHD Standard Specifications for Highways and Bridges and MUTCD requirements.

C. Safety Signing for Construction Operations shall be fabricated in accordance with the provisions of subsection M9.30.0, Type III or IV High Intensity, of the MHD Standard Specifications for Highways and Bridges, where these colors are specified.

D. Portable Type III Barricades shall conform with Standard Plate No. 406.2.0 of the MHD Construction and Traffic Standard Details (Metric Edition). Reflectorized sheeting to conform to Section M9.30.0 Type III or IV, of the MHD Standard Specifications for Highways and Bridges.

PART 3 - EXECUTION (NOT USED)
SECTION 01070

ABBREVIATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Wherever in these Specifications references are made to the standards, specifications, or other published data of the various international, national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only. As a guide to the user of these Specifications, the following acronyms or abbreviations which may appear in these Specifications shall have the meanings indicated herein.

1.2 ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>Aluminum Association</td>
</tr>
<tr>
<td>AAMA</td>
<td>Architectural Aluminum Manufacturer's Association</td>
</tr>
<tr>
<td>AAR</td>
<td>Association of American Railroads</td>
</tr>
<tr>
<td>AASHTO</td>
<td>American Association of State Highway and Transportation Officials</td>
</tr>
<tr>
<td>ACI</td>
<td>American Concrete Institute</td>
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<tr>
<td>ADA</td>
<td>American Disabilities Act</td>
</tr>
<tr>
<td>AFBMA</td>
<td>Anti-Friction Bearing Manufacturer's Association, Inc.</td>
</tr>
<tr>
<td>AGA</td>
<td>American Gas Association</td>
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<tr>
<td>AGMA</td>
<td>American Gear Manufacturers Association</td>
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<tr>
<td>AI</td>
<td>The Asphalt Institute</td>
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<tr>
<td>AIA</td>
<td>American Institute of Architects</td>
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<tr>
<td>AISC</td>
<td>American Institute of Steel Construction</td>
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<tr>
<td>AISI</td>
<td>American Iron and Steel Institute</td>
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<tr>
<td>AITC</td>
<td>American Institute of Timber Construction</td>
</tr>
<tr>
<td>AMCA</td>
<td>Air Moving and Conditioning Association</td>
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<tr>
<td>ANSI</td>
<td>American National Standards Institute, Inc.</td>
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<tr>
<td>APA</td>
<td>American Plywood Association or American Parquet Association, Inc.</td>
</tr>
<tr>
<td>API</td>
<td>American Petroleum Institute</td>
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<tr>
<td>APWA</td>
<td>American Public Works Association</td>
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<tr>
<td>ARI</td>
<td>Air-Conditioning and Refrigeration Institute</td>
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<tr>
<td>ASCE</td>
<td>American Society of Civil Engineers</td>
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<tr>
<td>ASLE</td>
<td>American Society of Lubricating Engineers</td>
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<tr>
<td>ASME</td>
<td>American Society of Mechanical Engineers</td>
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<tr>
<td>ASQC</td>
<td>American Society for Quality Control</td>
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<tr>
<td>ASSE</td>
<td>American Society of Sanitary Engineers</td>
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<tr>
<td>ASTM</td>
<td>American Society for Testing and Materials</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>AWS</td>
<td>American Welding Society</td>
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<td>AWWA</td>
<td>American Water Works Association</td>
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<tr>
<td>BBC</td>
<td>Basic Building Code, Building Officials and Code Administrators International</td>
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<tr>
<td>BHMA</td>
<td>Builders Hardware Manufacturer's Association</td>
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<tr>
<td>CABO</td>
<td>Council of American Building Officials</td>
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<tr>
<td>CDA</td>
<td>Copper Development Association</td>
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<tr>
<td>CGA</td>
<td>Compressed Gas Association</td>
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<tr>
<td>CLFMI</td>
<td>Chain Link Fence Manufacturer's Institute</td>
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<td>CMA</td>
<td>Concrete Masonry Association</td>
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<td>CRSI</td>
<td>Concrete Reinforcing Steel Institute</td>
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<td>DCDMA</td>
<td>Diamond Core Drill Manufacturer's Association</td>
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<td>DCR</td>
<td>Department of Conservation and Recreation</td>
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<td>DHI</td>
<td>Door and Hardware Institute</td>
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<td>DIPRA</td>
<td>Ductile Iron Pipe Research Association</td>
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<td>EIA</td>
<td>Electronic Industries Association</td>
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<td>ETL</td>
<td>Electrical Test Laboratories</td>
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<td>EPA</td>
<td>Environmental Protection Agency</td>
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<td>FCC</td>
<td>Federal Communications Commission</td>
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<td>FCI</td>
<td>Fluid Controls Institute</td>
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<td>FM</td>
<td>Factory Mutual System</td>
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<td>FPL</td>
<td>Forest Products Laboratory</td>
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<td>HI</td>
<td>Hydronics Institute</td>
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<td>HPMA</td>
<td>Hardwood Plywood Manufacturers Association</td>
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<tr>
<td>IAPMO</td>
<td>International Association of Plumbing and Mechanical Officials</td>
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<tr>
<td>ICBO</td>
<td>International Conference of Building Officials</td>
</tr>
<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
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<td>IES</td>
<td>Illuminating Engineering Society</td>
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<tr>
<td>IP</td>
<td>Institute of Petroleum (London)</td>
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<td>IPC</td>
<td>Institute of Printed Circuits</td>
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<td>IPCEA</td>
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<td>ISDSI</td>
<td>Insulated Steel Door Systems Institute</td>
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<td>ISA</td>
<td>Instrument Society of America</td>
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<td>ISEA</td>
<td>Industrial Safety Equipment Association</td>
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<td>ISO</td>
<td>International Organization for Standardization</td>
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<td>ITE</td>
<td>Institute of Traffic Engineers</td>
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<td>MADEP</td>
<td>Massachusetts Department of Environmental Protection</td>
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<td>MassDOT</td>
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<td>MBMA</td>
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<td>MHD</td>
<td>Massachusetts Highway Department</td>
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<td>Mechanical Power Transmission Association</td>
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<td>MSS</td>
<td>Manufacturers Standardization Society</td>
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<td>MUTCD</td>
<td>Manual of Uniform Traffic Control Devices</td>
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<td>MWRA</td>
<td>Massachusetts Water Resource Authority</td>
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<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>MTI</td>
<td>Marine Testing Institute</td>
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<td>NAAMM</td>
<td>National Association of Architectural Metal Manufacturer's</td>
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<td>NACE</td>
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<td>NAGDM</td>
<td>National Association of Garage Door Manufacturers</td>
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<td>NB</td>
<td>National Board of Boiler and Pressure Vessel Inspectors (alternate NBBPVI)</td>
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<td>NBS</td>
<td>National Bureau of Standards (Now NIST)</td>
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<td>NCCLS</td>
<td>National Committee for Clinical Laboratory Standards</td>
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<td>NEC</td>
<td>National Electrical Code</td>
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<td>NETA</td>
<td>International Electrical Testing Association</td>
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<tr>
<td>NFPA</td>
<td>National Fire Protection Association or National Fluid Power Association or National Forest Products Association</td>
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<td>NISO</td>
<td>National Information Standards Organization</td>
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<td>NLGI</td>
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<td>National Microfilm Association</td>
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<td>NPDES</td>
<td>National Pollution Discharge Elimination</td>
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<td>NWWDA</td>
<td>National Wood Window and Door Association</td>
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<td>OSHA</td>
<td>Occupational Safety and Health Administration</td>
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<td>PCA</td>
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<td>PPI</td>
<td>Plastics Pipe Institute</td>
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<td>RCRA</td>
<td>Resource Conservation and Recovery Act</td>
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<td>RMA</td>
<td>Rubber Manufacturers Association</td>
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<td>RVIA</td>
<td>Recreational Vehicle Industry Association</td>
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<td>RWMA</td>
<td>Resistance Welder Manufacturer's Association</td>
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<td>SAE</td>
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<td>SAMA</td>
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<td>SMA</td>
<td>Screen Manufacturers Association</td>
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<td>SMACCNA</td>
<td>Sheet Metal and Air Conditioning Contractors National Association</td>
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<tr>
<td>SPI</td>
<td>Society of the Plastics Industry, Inc.</td>
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<tr>
<td>SPIB</td>
<td>Southern Pine Inspection Bureau</td>
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<tr>
<td>SPR</td>
<td>Simplified Practice Recommendation</td>
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<tr>
<td>SSA</td>
<td>Swedish Standards Association</td>
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<tr>
<td>SSBC</td>
<td>Southern Standard Building Code, Southern Building Code Congress</td>
</tr>
<tr>
<td>SSPC</td>
<td>Society for Protective Coating</td>
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<td>SSPWC</td>
<td>Standard Specifications for Public Works Construction</td>
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<td>TAPPI</td>
<td>Technical Association of the Pulp and Paper Industry</td>
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<td>TFI</td>
<td>The Fertilizer Institute</td>
</tr>
<tr>
<td>TIA</td>
<td>Telecommunications Industries Association</td>
</tr>
<tr>
<td>TPI</td>
<td>Truss Plate Institute</td>
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</table>
PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01070
PART 1 - GENERAL

1.1 SUMMARY

A. Titles of Sections and Paragraphs: Captions accompanying specification sections and paragraphs are for convenience of reference only, and do not form a part of the Specifications.

B. Applicable Publications: Whenever in these Specifications references are made to published specifications, codes, standards, or other requirements, it shall be understood that wherever no date is specified, only the latest specifications, standards, or requirements of the respective issuing agencies which have been published as of the date that the Work is advertised for bids, shall apply; except to the extent that said standards or requirements may be in conflict with applicable laws, ordinances, or governing codes. No requirements set forth herein or shown on the Drawings shall be waived because of any provision of, or omission from, said standards or requirements.

C. Specialists, Assignments: In certain instances, specification text requires (or implies) that specific work is to be assigned to specialists or expert entities, who must be engaged for the performance of that work. Such assignments shall be recognized as special requirements over which the Contractor has no choice or option. These requirements shall not be interpreted so as to conflict with the enforcement of regulations governing the Work; also they are not intended to interfere with local union jurisdiction settlements and similar conventions. Such assignments are intended to establish which party or entity involved in a specific unit of work is recognized as "expert" for the indicated construction processes or operations. Nevertheless, the final responsibility for fulfillment of the entire set of Contract requirements remains with the Contractor.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Without limiting the generality of other requirements of the Specifications, all work specified herein shall conform to or exceed the requirements of applicable codes and the applicable requirements of the following documents.

"Uniform Fire Code," shall mean Uniform Mechanical Code, Uniform Plumbing Code and Uniform Fire Code of the International Conference of the Building Officials (ICBO). "Electric Code" or "National Electric Code (NEC)" shall mean the National Electric Code of the National Fire Protection Association (NFPA). The latest edition of the codes as approved by the Municipal Code and used by the local agency as of the date that the Work is advertised for bids, as adopted by the agency having jurisdiction, shall apply to the Work herein, including all addenda, modifications, amendments, or other lawful changes thereto.

C. In case of conflict between codes, reference standards, drawings and the other Contract Documents, the most stringent requirements shall govern. All conflicts shall be brought to the attention of the Engineer for clarification and directions prior to ordering or providing any materials or furnishing labor. The Contractor shall bid for the most stringent requirements.

D. The Contractor shall construct the Work specified herein in accordance with the requirements of the Contract Documents and the referenced portions of those referenced codes, standards, and specifications listed herein.


F. References herein to "OSHA Regulations for Construction" shall mean Title 29, Part 1926, Construction Safety and Health Regulations, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

G. References herein to "OSHA Standards" shall mean, Title 29, Part 1910, Occupational Safety and Health Standards, Code of Federal Regulations (OSHA), including all changes and amendments thereto.

H. References herein to "MUTCD Standards" shall mean, the latest edition of the Manual for Uniform Traffic Control Devices (MUTCD) published by the US DOT, including all changes and amendments thereto.

I. References herein to "MHD Standards" and/or “MASSDOT Standards” shall mean, the Massachusetts Highway Department Standard Specifications for Highways and Bridges, latest edition, including all changes and amendments thereto.

J. References herein to "ADA Standards" shall mean, the Americans with Disabilities Act of 1990 including all changes and amendments thereto.
K. ASTM: American Society for Testing Materials

L. AASHTO: American Association of State Highway and Transportation Officials

M. ACI: American Concrete Institute

N. Final Rule for the Accessibility Guidelines for Recreational Facilities and Outdoor Developed Areas by the Recreational Access Advisory Committee, US Architectural and Transportation Barriers Compliance Board, most recent edition, including all changes and amendments thereto.


1.3 REGULATIONS RELATED TO HAZARDOUS MATERIALS

A. The Contractor is responsible for ensuring that all work included in the Contract Documents, regardless if shown or not, shall comply with all EPA, OSHA, RCRA, NFPA, and any other Federal, State, and Local Regulations governing the storage and conveyance of hazardous materials, including petroleum products.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01090
SECTION 01108

HEALTH AND SAFETY PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Prepare a Health and Safety Plan (HASP) that meets all applicable state and federal health and safety regulations, including, but not limited to, those listed below. The Contractor shall be solely responsible for developing a HASP suitable for the Contractor's use and all work done by their subcontractors. The Owner, Engineer and/or their representative is not responsible for establishing or enforcing the health and safety requirements of the Contractor, and that nothing herein shall relieve the Contractor from its exclusive responsibility for the health and safety of its employees, and/or its representatives, and/or subcontractors.

B. The Contractor shall be responsible for being aware of all potential hazards at the site and reviewing existing information which provides evidence of contamination within the limit of the work.

C. The Contractor shall also be required to defend, indemnify, and hold the Town of Nahant, MA, and the Engineer harmless against any and all claims, liabilities, fines, or penalties arising out of actual or alleged failure of the Contractor and/or its agents, employees, or subcontractors to comply with any health or safety regulation, rule, ordinance, legislation, and/or health and safety plan.

D. All work required in the Specifications regarding development and implementation of a HASP shall be in accordance with State hazardous waste site regulations (310 CMR 40.0018) and OSHA requirements (29 CFR 1910 and 1926). The HASP shall be submitted to the Engineer prior to site mobilization. Work shall not proceed at the site until the Engineer and the City of Somerville have received a copy of the Contractor’s Health and Safety Plan meeting all the requirements specified herein.

E. The Contractor shall be responsible for the construction, maintenance, and dismantling of the decontamination areas specified within the HASP. This includes providing all labor, materials, and equipment to prepare, maintain in working order, and remove the decontamination area, including collection and disposal of decontamination water and solids, and subsequent dismantling and disposal of materials.

F. The Contractor is responsible for establishing, implementing and maintaining of ambient air and dust monitoring programs and all other environmental monitoring programs. All such programs shall be operated by the Contractor whenever there are soils handling construction activities occurring at the site.
G. The Contractor shall be responsible for providing all materials, equipment, and labor associated with applying dust and/or vapor control suppressants, including equipment that shall be required during all soil handling activities, in the event that fugitive dust or excessive odors are encountered.

1.2 DUST CONTROL

A. During excavation of soil and fill material, dust shall be controlled to limit potential spread of contaminants and potential exposure of contaminants to workers and the public. The dust control measures implemented at the site shall be performed in accordance with this Section.

B. During the progress of the work, the Contractor will conduct his operations and maintain the area of his activities, including sweeping and sprinkling of water if acceptable to the Engineer, so as to minimize the generation and dispersion of dust.

1.3 AIR MONITORING

A. Air monitoring shall involve direct reading instruments capable of providing real-time indications of air contaminants to protect on-site personnel and the local population. The Contractor's Site Health and Safety Officer and Superintendent shall be responsible for assuring that monitoring is conducted in an approved manner, that air monitoring/sampling are conducted at a frequency sufficient to ensure accurate assessments of site conditions, and that work practices, engineering controls, and/or personal protective equipment are proper for the conditions.

B. At a minimum, detectors for organic contaminants shall be utilized to monitor on-site and off-site breathing zones and possible sources of potentially hazardous material (e.g., excavations, regrading, etc.). All personnel shall be made aware of the potential hazards and be informed of air monitoring information. Particular attention to air quality shall be made in the work area during earthwork activities to ensure that contaminants do not escape to the atmosphere and affect off-site population, on-site control, working conditions, and personnel protection measures.

C. The Contractor shall keep accurate documentation of all air monitoring, which shall be made available to the Owner and Engineer for review at all times.
PART 2 - PRODUCTS

2.1 HEALTH AND SAFETY PLAN AND CERTIFICATIONS

A. The Contractor shall, prior to the start of work on the site, submit a copy of its site-specific Health and Safety Plan to the Engineer. Submit with the site-specific Health and Safety Plan, a certification that states the following:

1. The Contractor hereby certifies that the Contractor and any workers engaged in work on the project meet the requirements of 29 CFR 1910.120 and the provisions of the American National Standards Institute, Standard Z88.2, for training, medical surveillance, and respirator protection unless the operation does not involve employee exposure or the reasonable possibility for employee exposure to safety or health hazards. These requirements include, but are not limited to, the following items:
   a. The Contractor's employees have been examined by a licensed physician within the last 12 months and have been determined to be physically able to perform the work and use the respirator and other protective or safety equipment required for this assignment.
   b. The employees have received health and safety training for working in environments with known and unknown hazards within the past twelve months.
   c. The Contractor has established and is maintaining a respiratory protection program that complies with the provision of 29 CFR 1910.134.
   d. The Contractor maintains appropriate surveillance of the work area conditions and degree of employee exposure or stress.

2. The Contractor shall further certify that only respirators approved or accepted by NIOSH/MSHA shall be provided and used by the Contractor's employees; that each of the Contractor's employees has been properly fitted to the respirators provided by the Contractor, including a test of the face-to-face piece seal; that the Contractor has provided its employees with written procedures covering the use of respirators in dangerous atmospheres; and that the Contractor has established a program for inspection, maintenance, and care of the respirators.

   The certification shall be signed and dated by the Contractor.

3. Work shall not proceed at the project site until the Engineer has received all certification(s) and the Contractor's Health and Safety
Plan. Any delays incurred by the Contractor relating to the Health and Safety Plan shall be the responsibility of the Contractor and constitute no additional costs or claims to the City of Somerville.

PART 3 - EXECUTION

3.1 HEALTH AND SAFETY PLAN CONTENTS, MAINTENANCE, AND IMPLEMENTATION

A. The Contractor's Plan shall address the specific work activities to be conducted by the Contractor. The HASP shall include, but not be limited to, the following:

1. All anticipated hazards based on site conditions, construction activities and the levels of contamination and information presented in previous studies.

2. Provisions for continually updating the Plan in accordance with any new applicable state and federal regulations or any additional information regarding conditions at the site.

3. The following information, shall be included in the HASP in accordance with the minimum standards set forth in 29 CFR 1910.120, 29 CFR 1910.1000, and 29 CFR 1926, and 310 CMR 40.0018:

a. Contractor's Standard Operating Procedures, including Personnel Training and Field Orientation; Personal Hygiene Requirements and Guidelines; Field Monitoring of Site Contaminants; Respiratory Protection Training and Requirements; Levels of Protection and Selection of Equipment Procedures; Zone Delineation of the Project Site; Site Security and Entry Control Procedures; Contingency and Emergency Procedures; and Listing of Emergency Contacts.

b. Identification of Contractor's Site Safety Officer.

c. Identification of Contractor's Designated Field Personnel.

d. Identification of hazard and risks associated with the Contractor's work.

e. Type of Medical Surveillance Program.

f. List of all hazardous materials that the Contractor shall have on site; the location of the latest Material Safety Data Sheets (MSDS) for each material listed; and the plan for notifying all on-site personnel, including, but not limited to, the Engineer.
and/or their representatives, of the presence of hazardous materials on site. If there are no hazardous materials to be brought on site, the Contractor shall provide a written statement to the Engineer and/or their representative, prior to initiating work activities, certifying that the Contractor shall not transport, store, or use hazardous materials on site.

B. The Contractor shall keep a copy of the HASP on site during all operations and shall conduct daily health and safety meetings. Failure to keep a copy of the HASP on site, or any other breach of the Contractor's Plan, shall be cause for stopping work at the cost of the Contractor. Delays caused by the Contractor's failure to comply with the health and safety regulations, or any health and safety plan, shall not entitle the Contractor to recover any additional costs or time lost. The Contractor shall not be allowed to resume activities until corrective measures are implemented.

C. Medical surveillance records, OSHA 40-hour training forms, accident forms, and all other documentation requirements of the Contractor's health and safety plan for personnel working on the site shall be up-to-date and kept on file at the site. The Contractor shall provide documentation of employee status upon request of the Engineer.

D. The Contractor shall make available Level C personal protective equipment and clothing, not including respirators, to the Engineer and/or their representative for use during site inspections by the Engineer and/or their representative, up to a maximum of three (3) complete sets per day. These shall be supplied and maintained at no cost to the Owner and shall be returned to the Contractor upon completion of the work (except for expendable disposal protective clothing). The Contractor shall provide a repository for collection of disposed health and safety materials. Collection and disposal of contaminated expendable supplies shall be the Contractor's responsibility.

E. The level of dermal and respiratory protection shall be determined based upon continuous air monitoring to be performed by the Contractor. The Engineer may conduct duplicate air monitoring for quality control purposes. As air monitoring indicates the levels of contaminants in the air, the personal protective equipment shall be determined based upon established standards and the standards set forth in the Contractor's Health and Safety Plan. Regardless, modified Level D protection for all on-site personnel is the minimum project requirement.

F. The Contractor shall be aware of site-specific requirements, such as site security during non-working hours, limited work space, and minimizing the effects of soil excavation, in preparing its health and safety program.

3.2 ROUTINE SAFETY MEETINGS

A. The Contractor shall keep a copy of the HASP on site during all operations and shall conduct routine health and safety meetings to ensure that all work is
being performed in accordance with OSHA regulations, the Contractor’s HASP, and prior to initiating a new task, following an incident or following any changes to the HASP necessitated by site conditions. Failure to conduct routine safety meetings may be cause for stopping work at the cost of the Contractor.

PART 4 – COMPENSATION (NOT USED)

END OF SECTION 01108
SECTION 01110

ENVIRONMENTAL PROTECTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2 SCOPE OF WORK

A. The work covered by this section consists of furnishing all labor materials and equipment and performing all work required for the prevention of environmental pollution in conformance with applicable laws and regulations, during and as the result of construction operations under this Contract. For the purpose of this Specification, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environmental for aesthetic and/or recreational purposes.

B. The control of environmental pollution requires consideration of air, water, and land, and involves management of noise and solid waste, as well as other pollutants.

C. Schedule and conduct all work in a manner that will minimize the erosion of soils in the area of the work. Provide erosion control measures such as diversion channels, sedimentation or filtration systems, berms, staked hay bales, seeding, mulching, or other special surface treatments as are required to prevent silting and muddying of streams, rivers, impoundments, lakes, etc. All erosion control measures shall be in place in an area prior to any construction activity in that area.

Specific requirements for erosion and sedimentation controls are specified in Section 01568.

D. These Specifications are intended to ensure that construction is achieved with a minimum of disturbance to the existing ecological balance between a water resource and its surroundings. These are general guidelines. It is the Contractor's responsibility to determine the specific construction techniques to meet these guidelines.
E. Schedule and conduct all work in a manner that will minimize the level of noise escaping the site, especially at night and on weekends.

1.3 APPLICABLE REGULATIONS

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

1.4 NOTIFICATIONS

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

1.5 IMPLEMENTATION

A. Prior to commencement of the work, meet with the Engineer to develop mutual understandings relative to compliance with this provision and administration of the environmental pollution control program.

B. Remove temporary environmental control features, when approved by the Engineer, and incorporate permanent control features into the project at the earliest practicable time.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EROSION CONTROL

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

3.2 PROTECTION OF STREAMS WETLANDS, AND SURFACE WATER

A. Care shall be taken to prevent or reduce to a minimum any damage to any stream, drainage ditch, storm drain of sewer from pollution by debris, sediment, or other material, or from the manipulation of equipment and/or materials in or near such streams. Water that has been used for washing or processing, or that contains oils or sediments that will reduce the quality of the water in the stream, shall not be directly returned to the stream. Such water will be diverted through a settling basin or filter before being directed into the streams.

B. The Contractor shall not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, surface water, or any storm drain. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels.

C. All preventative measures shall be taken to avoid spillage of petroleum products and other pollutants. In the event of any spillage, prompt remedial action shall be taken in accordance with a contingency action drawing or plan approved by the Massachusetts Department of Environmental Protection. Contractor shall submit to copies of approved contingency drawings or plans to the Engineer.

D. Water being flushed from structures or pipelines after disinfection, with a chlorine residual of 2 mg/l or greater, shall be treated with a dechlorination solution, in a method approved by the Engineer, prior to discharge.

3.3 PROTECTION OF LAND RESOURCES

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

B. Outside of areas requiring earthwork for the construction of the new facilities, the Contractor shall not deface, injure, or destroy trees or shrubs, nor remove or cut them without prior approval. No ropes, cables, or guys shall be fastened to or attached to any existing nearby trees for anchorage unless specifically authorized by the Engineer. Where such special emergency use is permitted, first wrap the trunk with a sufficient thickness of burlap or rags over which softwood cleats shall be tied before any rope, cable, or wire is placed. The Contractor shall in any event be responsible for any damage resulting from such use.
C. Where trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment, dumping or other operations, protect such trees by placing boards, planks, or poles around them. Monuments and markers shall be protected similarly before beginning operations near them.

D. Any trees or other landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition. The Engineer will decide what method of restoration shall be used and whether damaged trees shall be treated and healed or removed and disposed of.

All scars made on trees by equipment, construction operations, or by the removal of limbs larger than 1-in. in diameter shall be coated as soon as possible with an approved tree wound dressing. All trimming or pruning shall be performed in an approved manner by experienced workmen with saws or pruning shears. Tree trimming with axes will not be permitted.

Trees that are to remain, either within or outside established clearing limits, that are subsequently damaged by the Contractor and are beyond saving in the opinion of the Engineer shall be immediately removed and replaced.

E. The locations of the Contractor's storage, and other construction building, required temporarily in the performance of the work, shall be cleared portions of the job site and shall not be within wetlands or floodplains. The preservation of the landscape shall be an imperative consideration in the selection of all sites and in the construction of buildings.

F. Remove all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess of waste materials, or any other vestiges of construction as directed by the Engineer. It is anticipated that excavation, filling, and plowing of roadways will be required to restore the area to near natural conditions which will permit the growth of vegetation thereon. The disturbed areas shall be prepared and seeded as described in Section 02480, or as approved by the Engineer.

G. All debris and excess material will be disposed of outside wetland or floodplain areas in an environmentally sound manner.

3.4 PROTECTION OF AIR QUALITY

A. Burning. The use of burning at the project site for the disposal of refuse and debris will not be permitted.

B. Dust Control. The Contractor will be required to maintain all excavations, embankments, stockpiles, access roads, plant sites, waste areas, borrow areas, and all other work areas within or without the project boundaries free from
dust which could cause the standards for air pollution to be exceeded, and which would cause a hazard or nuisance to others.

C. An approved method of stabilization consisting of sprinkling or other similar methods will be permitted to control dust. The use of chlorides may be permitted with approval from the Engineer.

D. Sprinkling, to be approved, must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Dust control shall be performed as the work proceeds and whenever a dust nuisance or hazard occurs, as determined by the Engineer.

3.5 NOISE CONTROL

A. The Contractor shall make every effort to minimize noises caused by his operations. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with State and Federal (OSHA) regulations.

END OF SECTION 01110
PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section specifies general requirements for construction, protection, support, maintenance, and restoration for underground and overhead utilities affected by construction of the Project. The Work includes new construction, reconstruction, relocation, and abandonment.

B. The utility works and services that may be affected include, but are not limited to:

1. Storm drain, sanitary sewer, and combined sewer

2. Water distribution

3. Gas distribution

4. Electric power and street lighting

5. Telephone

6. Traffic signals

7. Fiber optic communications

8. Cable Television

9. Signal communication

10. City fire signal lines

C. This Section shall be used in conjunction with the specific underground utility work sections that apply to the Contract.
1.2 WORK BY UTILITY COMPANIES

A. Certain parts of the utility work shall be performed, where shown or specified or otherwise required, by the utility company.

B. For all utilities, with the exception of sanitary sewers; combined sewers; and water, disconnecting and connecting of service shall be performed by the respective utility companies. Disconnecting and connecting of sanitary sewers; combined sewers; and water services shall be the Contractor’s responsibility as required in the Contract Documents.

C. Contact the utility companies in advance of construction to allow sufficient time for the utility companies to accomplish the work they are required to perform. Provide the utility company at least 30 days advance notice of scheduled date for commencement of work by the utility company.

D. Work performed by utility companies as part of the Work of this Contract, in order to facilitate the Work of this Contract, and other work performed by utility company solely for the Contractor’s convenience, shall be at no additional cost to the Owner.

1.3 DEFINITIONS

A. Abandoned means that use has been discontinued by the utility company.

B. To be abandoned means that use will be discontinued as part of the Work of this Contract.

C. Maintenance means providing continuous and satisfactory service during construction.

D. Maintain complete-in-place means to protect, support, and otherwise maintain the existing condition and function of a facility during construction.

E. Restoration means replacement of a facility or portions of a facility that have been removed or made inoperative by the Contractor in the performance of the Work.

F. Utility Company means the company, agency, owner, or operator of the facility concerned.

G. Temporary Facility means a facility provided, in lieu of an existing or new facility, to ensure continuity of service. When a temporary facility is not shown on the Contract Drawings, but is provided for the convenience of the Contractor, it shall be constructed at no additional cost to the Owner.

1.4 SUBMITTALS

Washburn CSO Control Project
Conformed Documents
GENERAL REQUIREMENTS
FOR UTILITY WORK
01200-2
A. Shop Drawings: Submit the following in accordance with Section 01300 - SUBMITTALS

1. Submit working drawings and, if applicable, shop drawings showing the details, procedures, and scheduling for performance of each utility work. Show actual verified field locations of existing utility facilities that are affected by the Work of this Contract; interferences which these facilities present to the new work; location of settlement markers; method proposed to proceed with the construction; and, if applicable, method of testing and procedure for restoration.

2. Submit to the Engineer specifications and drawings describing the method to be used to temporarily support existing subsurface, surface and overhead utilities during construction. Include working drawings that indicate proposed materials and details.

3. Submit to the Engineer for review a detailed excavation procedure for subsurface utilities. At a minimum, the procedure shall include:
   
a. Equipment to be used for anticipated subsurface utility investigation and excavation.

  b. Personnel to be used and designated utility coordinator.

  c. Duration and schedule of investigation and excavation.

  d. Techniques proposed to isolate and protect existing utilities.

  e. Method for the Contractor to provide utility information derived from subsurface investigation to field personnel doing excavation.

  f. A disciplinary plan that delineates all steps to be taken as a result of a utility disruption, including possible removal of Contractor's individuals from the site.

4. Submit an emergency action plan outlining procedures to be followed by the Contractor in case of unplanned utility interruptions or unplanned damage to utilities in service. Obtain concurrence from each affected utility company.

   a. List Contractor's personnel assigned responsible charge for emergency action on site for each shift, and those on call.

   b. List phone notification numbers for each utility company, fire, and police departments, and other relevant agencies.
c. Include copies of utility plans showing the valve or switch locations to isolate each line.

C. Transmit to the Engineer the as-built utility location survey data as specified in Article 3.10 of this Section.

1.5 APPROVAL BY UTILITY COMPANIES

A. All personnel performing work on utility facilities shall be fully qualified and able to meet the standards of the affected utility company. If the Contractor does not have the required utility experience, Contractor shall retain a specialist firm acceptable to the affected utility company to perform the Work.

B. Prior acceptance of temporary support methods for each affected utility facility shall be obtained by the Contractor from each utility company concerned.

C. Prior permission for disrupting a utility shall be obtained by the Contractor from each utility company concerned.

D. Prior approval for disrupting fire signal lines, high pressure fire water mains and hydrants, and fire service lines shall be obtained from the Springfield Fire Department.

1.6 NOTIFICATION

A. In addition to the initial 30 day utility company notification, the Contractor shall notify the appropriate utility companies and the Engineer at least seven days prior to starting any work involving or adjacent to surface, subsurface, or overhead utility facilities.

B. Gas Company Requirements:

1. If cut-off or connection is expected, notify the Gas Company Engineering Department four weeks prior to cut-off or connection to gas main.

2. Immediately notify the Gas Company Engineering Department if surface or subsurface settlement or movement in excess of the design amount is observed, regardless of the proximity to an existing gas facility.

1.7 STANDARD SPECIFICATIONS OF UTILITY OWNERS
A. Specifications and construction methods from each utility owner apply to individual utility specification sections.

B. It is the Contractor's responsibility to ensure that, unless otherwise specified, the standards for materials and construction methods required by the utility owner are met.

1.8 WORK BY GAS COMPANY

A. Contractor shall be aware of the requirements of 220 CMR 113.00 regarding the OPERATION, MAINTENANCE, REPLACEMENT AND ABANDONMENT OF CAST-IRON PIPELINES, specifically as it relates to the replacement of existing cast-iron gas mains exposed during construction or within the Angle of Influence of the excavation. The Contractor shall coordinate the scheduling of all replacements with Columbia Gas and shall make all efforts to accommodate the gas main replacement. Columbia Gas shall perform the work associated with the replacement.

PART 2 – MATERIALS

2.1 GENERAL

A. Materials for temporary and permanent work shall be of the type, grade, and class specified by reference to utility company standards.

PART 3 – EXECUTION

3.1 GENERAL CONSTRUCTION REQUIREMENTS

A. Unless otherwise noted, conform to the construction standards, specifications, and standard practices of the affected utility companies. Coordinate with each utility company the work to be done by the Contractor and the work to be done by utility company. Ensure continuity of all existing utility services to all users, except when the utility company determines that temporary interruption is acceptable.

B. Unless otherwise indicated, maintain all utility facilities complete in place. Provide temporary support of utilities during construction only by methods acceptable to the utility company concerned.

C. Provide and maintain all temporary facilities required to provide interim utility service when a utility facility is to be relocated and when a utility facility to be replaced is abandoned prior to replacement.

D. Where an existing utility facility is encountered that is not indicated or that is determined to be a different utility facility than that indicated, promptly notify the Engineer. The Contractor is responsible for determining the owner of the facility and the disposition of the facility.
E. All water, sanitary, combined sewer, and storm services must be maintained throughout the project through the use of temporary pumps and piping. Unless otherwise noted, no service interruptions will be permitted.

F. The Contractor shall dewater existing utility manholes and structures prior to beginning construction. Any dewatered material shall be properly treated and disposed.

3.2 UNSAFE AND UNSUITABLE UTILITY STRUCTURES

A. If, upon exposure, the condition of a facility to be maintained complete-in-place is found to be unsafe, by the utility company, for support or for maintenance of service, the Contractor shall replace or reconstruct or coordinate the replacement or reconstruction of the facility with the utility Owner and shall promptly notify the Engineer of additional costs anticipated prior to beginning the work.

3.3 ABANDONED FACILITIES

A. Demolish and remove abandoned utility facilities located within areas of the Work of this Contract. Abandoned facilities that do not interfere with the Work of this Contract may remain.

B. Do not undertake demolition or removal until written permission for such Work has been obtained from the utility company.

C. When abandoned facilities are to be left in place, plug or cap the ends of conduits and pipes, and fill with control density fill (CDF) unless otherwise indicated. Remove abandoned utility manholes, junction boxes, and similar structures to a minimum depth of four feet below finish grade, and puncture or break the bottom slabs of manholes and similar structure to allow drainage. Backfill and compact excavations resulting from removal of utility facilities as required to restore original grade.

3.4 SETTLEMENT OR MOVEMENT

A. In case of settlement or other movement that causes or could cause damage, take immediate remedial measures to correct the conditions and repair the damage.

3.5 ACCESS

A. At all times permit free and clear access to the affected facilities by personnel of the utility companies.
B. Throughout the construction period, maintain access to all utility vaults and structures.

3.6 SERVICE CONNECTIONS

A. Work required for maintaining, supporting, relocating, restoring, and constructing all service connections is included as part of the Work of this Contract, even though some existing service connections, for which record information is not available, may not be shown on the Contract Drawings.

3.7 REPAIR AND RESTORATION

A. Repair all damage to utilities caused by Work of this Contract. Clean all utility structures of dirt caused by Work of this Contract. Immediately notify the Engineer and the utility company of damage to utilities.

3.8 EXCAVATION AND BACKFILL

A. Perform excavation and backfill in connection with utility work in accordance with Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING.

B. Excavation and handling of contaminated soil is specified in Sections 02080 - SOIL AND WASTE MANAGEMENT, and 02095 – TRANSPORTATION AND DISPOSAL OF SOIL AND FILL.

C. Perform excavation support in connection with utility work in accordance with Section 02160 – TEMPORARY EXCAVATION SUPPORT SYSTEMS.

D. Perform groundwater control in connection with utility work in accordance with Section 02140 – DEWATERING.

E. Perform erosion and sedimentation control in connection with utility work in accordance with Section 01500 – TEMPORARY FACILITIES AND CONTROLS.

3.9 CLEANING UP

A. In accordance with Section 01630 – RESTORATION OF GROUNDS AND CLEANING UP, the Contractor shall, upon completion of the Work, remove all temporary construction facilities, equipment, debris, and unused materials, and put the project area and adjacent affected areas in a neat and clean condition.

3.10 AS-BUILT UTILITY LOCATION SURVEY
A. For each new or relocated utility installed, including those installed or relocated by others in the Project Area, perform an as-built location survey by coordinates prior to backfilling the excavation.

B. The survey data shall be obtained by Global Positioning Survey (GPS) and certified by a Professional Land Surveyor registered in Massachusetts.

C. A complete digital base plan shall be provided in AutoCAD DWG format Release 2000i or later on a Compact Disk (CD), properly referenced to the coordinate system established in the contract. The following standards shall be applicable:

- Text as indicated below:
  All text shall be drawn using a STYLE of "L100-XX" (where XX refers to the plotted scale) and a font file of "SIMPLEX" as defined in the AutoCAD survey template provided by S E A Consultants Inc. The style shall be defined as a "fixed height" style, and have a height of 0.10 times the drawing plotted scale. (i.e. 4.0 for 40 scale plan, 2.0 for 20 scale etc.).

- Precision and Accuracy as indicated below:
  Horizontal survey:
  Precision: Horizontal control and surveyed points shall maintain a minimum precision of 1:10,000.
  Accuracy: No more than 10% of the survey points shall be in error by more than 1/100 inch or 0.25 mm when viewed at the requested scale.

  Vertical survey:
  Precision: Vertical Control shall have a maximum error of closure no greater than .075 feet or .02 meters.
  Accuracy: No more than 10% of elevations when interpolated from a Surface shall be in error of more than 1/2 a contour interval.

- Surface Data
  The data format shall conform to Autodesk Land Development Desktop Project files. If the Contractor uses a different software product to create a surface, then the surface must be represented as a TIN (Triangulated Irregular Network) of 3D lines on a separate, distinct layer within the AutoCAD drawing file. 3D faces or 2 dimensional lines are NOT acceptable.

PART 4 – COMPENSATION

Item 1200.1 – Temporary Utility Support and Coordination

METHOD OF MEASUREMENT:
Payment for Temporary Utility Support and Coordination shall be based on the Lump Sum Price bid for this item in the proposal. Measurement for payment shall be based on the
percentage of project completion based on elapsed time compared to the contractual construction time limit as measured and approved by the Engineer.

**BASIS OF PAYMENT/INCLUSION:**
Under the Lump Sum Price bid for this item, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals required to maintain temporary utility support, and coordination as directed by the Engineer. This work includes furnishing, installing, and/or performing the following: maintain continuity of water, storm drain, sanitary sewer, and all other utilities (gas, telephone, electric, telecommunications, cable TV) to all dwellings, as well as trunk, supply, transmission, and main lines, and all privately owned utilities and structures impacted by the Work; coordinate and/or temporarily support all utility poles during the installation of the temporary earth support; to support in a more long term manner, the utility poles during the progress of the Work; support of utilities exposed during the excavation for the installation of the Work; submission of all utility coordination and support work plans and shop drawings; coordinate the protection of and protect all overhead utilities; and perform all coordination with the utility companies for the relocation, protection, support, and other work required to facilitate the completion of the project; utility location; temporary and permanent relocation of piping conduit and structures; surface restoration for relocated or temporary utilities including temporary pavement and permanent pavement repair; coordination of construction with existing utility owners and operators; providing access for utility owners and operators to their respective utilities; and communicating with affected homeowners and residents; maintain, and disconnect portable generators to maintain electrical service to dwellings, if necessary; and all incidental work not included for payment elsewhere.

**SPECIAL NOTES ON EXCLUSIONS:**
The following item(s) are not included for payment under this item and are included for payment elsewhere: providing temporary by-pass of domestic water, sanitary sewers and storm drains, support of existing large utilities, construction of temporary sewers, and permanently relocating sanitary sewers, storm drains, and water mains and services for sanitary sewers, storm drains and domestic water.

**Item 1200.2 – Temporary Support of Existing Large Utilities**

**METHOD OF MEASUREMENT:**
Measurement for payment for Support of Existing Large Utilities shall be based on the percent of utility support completed, as approved by the Engineer, according to the Contractor’s submitted schedule of values as further accepted by the Engineer.
of utility support system to the Engineer for review; furnish and install utility support system, including additional support as identified by the Engineer during the submittal review; removal of utility support system following completion of the work or left in place as necessary.

EXCLUSIONS:
This item includes the support of existing pipes, duct banks and handholes which are proposed to be crossed underneath for the proposed work. Support of utility crossing submittals shall be provided in advance to the Engineer for review. Utility crossings which do not meet the proposed means and methods as detailed in the submittal shall not be eligible for payment. Existing large diameter utilities which are damaged or broken as a result of inadequate support shall not be eligible for payment, and shall be repaired or replaced at the Contractor’s expense.

Payment will not be made for utility crossings required to facilitate the Contractor’s means and methods. Support of utilities less than 36-inch diameter or utilities installed under this Contract are included for payment elsewhere. Excavation, backfill and restoration of trenches, and utility monitoring for utility crossings are included for payment elsewhere.

END OF SECTION 01200
SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.1. RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2. SUMMARY

A. This section specifies the general methods and requirements of submissions applicable to the following work-related submittals.

1. Shop Drawings
2. Product Data
3. Samples
4. Operation and Maintenance Manuals
5. Construction Photographs
6. Construction or Submittal Schedules
7. Or equal submittals

B. Additional general submission requirements are contained in Paragraph 6.17 of the General Conditions.

C. Detailed submittal requirements will be specified in the technical specifications section.

1.3. SHOP DRAWINGS, PRODUCT DATA, SAMPLES

A. Shop Drawings:

1. Shop drawings, as defined in the General Conditions, and as specified in individual work sections include, but are not necessarily limited to: custom-prepared data such as fabrication and erection/installation (working) drawings of concrete reinforcement, structural details and piping layout, schedule information, setting diagrams, actual shopwork manufacturing instructions, custom templates, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports including performance curves
and certifications as applicable to the work.

2. All shop and working drawings shall be prepared on standard size, 22-in. by 34-in. sheets, except those which are made by changing existing standard shop or working drawings.

3. All shop drawings shall be submitted using a transmittal form approved by the Engineer. Submittal form shall include identification of transmittal number and specification section number.

4. All shop drawings submitted by subcontractors for review shall be sent directly to the Contractor for approval. The Contractor shall be responsible for their submission at the proper time so as to prevent delays in delivery of materials.

5. The Contractor shall check all subcontractor's shop drawings regarding measurements, size of members, materials, and details to satisfy himself that they conform to the intent of the Drawings and Specifications. Shop drawings found to be inaccurate or otherwise in error shall be returned to the subcontractors for correction before submission thereof.

6. All details on shop drawings submitted for approval shall show clearly the relation of the various parts of the main members and lines of the structure, and where correct fabrication of the work depends upon field measurements, such measurements shall be made and noted on the drawings before being submitted for approval.

B. Product Data:

1. Product data as specified in individual sections, include, but are not necessarily limited to, standard prepared data for manufactured products (sometimes referred to as catalog data), such as the manufacturer's product specification and printed installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances including certificates of compliance and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications and recommended spare-parts listing, and printed product warranties, as applicable to the Work.

C. Samples:

1. Samples specified in individual sections, include, but are not necessarily limited to, physical examples of the work such as sections of manufactured or fabricated work, small cuts or containers of materials, complete units of repetitively-used products, color/texture/pattern swatches and range sets, specimens for coordination of visual effect, graphic symbols, and units of work to be used by the Engineer or Owner for independent inspection and testing, as applicable to the Work.
1.4. CONTRACTOR’S RESPONSIBILITIES

A. The Contractor shall review shop drawings, product data and samples, including those by subcontractors, prior to submission to determine and verify the following:

1. Field measurements
2. Field construction criteria
3. Catalog numbers and similar data
4. Conformance with the Specifications

B. Each shop drawing, sample, and product data submitted by the Contractor shall have affixed to it the following Certification Statement including the Contractor's Company name and signed by the Contractor: “Certification Statement: by this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.” Shop drawings and product data sheets 11-in. X 17-in. and smaller shall be bound together in an orderly fashion and bear the above Certification Statement on the cover sheet. The cover sheet shall fully describe the packaged data and include a listing of all items within the package. Provide to the Engineer a copy of each submittal transmittal form for shop drawings, product data and samples at the time of submittal of said drawings, product data and samples to the Engineer.

1. Submittals received “WITHOUT” Certification Statement shall not be reviewed.

C. If a shop drawing shows any deviation from the requirements of the Contract Documents, the Contractor shall make specific mention of the deviations in the Transmittal Form furnished by the Engineer and provide a description of the deviations in a letter attached to the submittal.

D. The review and approval of shop drawings, samples or product data by the Engineer shall not relieve the Contractor from his responsibility with regard to the fulfillment of the terms of the Contract. All risks of error and omission are assumed by the Contractor and the Engineer will not have responsibility therefore.

E. No portion of the work requiring a shop drawing, sample, or product data shall be started nor shall any materials be fabricated or installed prior to the approval or qualified approval of such item. Fabrication performed, materials purchased or on-site construction accomplished which does not conform to approved shop drawings and data shall be at the Contractor's risk. The Owner will not be liable for any expense or delay due to corrections or remedies required to accomplish conformity.
F. Project work, materials, fabrication, and installation shall conform to approved shop
drawings, applicable samples, and product data.

1. Manufacturer’s printed installation instructions, a part of product data
submitted to the Engineer will not be reviewed and are for informational
purposes only.

1.5 “OR EQUAL”

A. Should the Contractor seek approval of a product other than the brand or brands named
in these specifications, it shall furnish written evidence that such product conforms in
all respects to the specified requirements, and that it has been used successfully
elsewhere under similar conditions. Where the specified requirements involve
conformance to recognized codes or standards the Contractor shall furnish evidence of
such conformance in the form of test or inspection reports, prepared by a recognized
agency, and bearing an authorized signature.

B. Manufacturers’ standard data and catalog cut sheets will not be considered sufficient in
themselves, and the Engineer will not be responsible for seeking further data from the
manufacturer, or for otherwise researching the product. Failure to provide complete
data will be cause for rejection of the product.

C. The Contractor shall be responsible for all additional costs including license fees,
foundation, piping and electrical work necessary to accommodate the proposed “or
equal” equipment. Items which result in a cost reduction shall be presented and a
change order reflecting 65% of the cost savings will be prepared and the contract price
modified.

1.6 SUBMISSION REQUIREMENTS

A. Make submittals promptly in accordance with approved schedule, and in such sequence
as to cause no delay in the Work or in the work of any other contractor.

B. All complete submittals shall be submitted sufficiently in advance of construction
requirements to provide no less than fifteen (15) days, excluding Saturdays, Sundays
and legal holidays for review from the time received at the Engineer’s reviewing office.
For submittals of major equipment, that require more than fifteen (15) days to review,
due to its complexity and amount of detail and also requiring review by more than one
engineering discipline, a letter will be sent by the Project Manager or his/her designee
to the Contractor informing him/her of the circumstances and the date it is expected the
submittal will be returned to the Contractor.

C. Number of submittals required:

1. Shop Drawings: Unless otherwise stated in the respective Specifications
Sections, submit six (6) copies.

2. Product Data: Unless otherwise stated in the respective Specifications submit
six (6) copies.

3. Samples: Submit the number stated in the respective Specification Sections.

D. Submittals shall contain:

1. The date of submission and the dates of any previous submissions.
2. The Project title and number.
3. Contractor identification.
4. The names of:
   a. Contractor
   b. Supplier
   c. Manufacturer
5. Identification of the product, with the specification section number, page and paragraph(s).
6. Field dimensions, clearly identified as such.
7. Relation to adjacent or critical features of the Work or materials.
8. Applicable standards, such as ASTM or Federal Specification numbers.
10. Identification of revisions on resubmittals.
11. An 8-in. x 3-in. blank space for Contractor and Engineer stamps.

E. Each shipment of drawings shall be accompanied by a transmittal form furnished by the Engineer giving a list of the drawing numbers and the names mentioned above.

1.7 REVIEW OF SHOP DRAWINGS, PRODUCT DATA, WORKING DRAWINGS AND SAMPLES

A. The Engineer's review is for general conformance with the design concept and contract drawings. Markings or comments shall not be construed as relieving the Contractor from compliance with the contract plans and specifications or from departures therefrom. 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.

B. The review of shop drawings, data, and samples will be general. They shall not be
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.

C. If the shop drawings, data or samples as submitted describe variations and show a departure from the Contract requirements which the Engineer finds to be in the interest of the Owner and to be so minor as not to involve a change in Contract Price or time for performance, the Engineer may return the reviewed drawings without noting an exception.

D. Two (maximum) copies of shop drawings or product data will be returned to the Contractor. Samples will not be returned.

E. Submittals will be returned to the Contractor under one of the action codes indicated and defined on the transmittal form furnished by the Engineer.

F. Resubmittals will be handled in the same manner as first submittals. On resubmittals the Contractor shall direct specific attention, in writing, on the letter of transmittal and on resubmitted shop drawings by use of revision triangles or other similar methods, to revisions other than the corrections requested by the Engineer, on previous submissions. Any such revisions which are not clearly identified shall be made at the risk of the Contractor. The Contractor shall make corrections to any work done because of this type revision that is not in accordance to the Contract Documents as may be required by the Engineer.

G. Partial submittals may not be reviewed. The Engineer will be the only judge as to the completeness of a submittal. Submittals not complete will be returned to the Contractor, and will be considered "Rejected" until resubmitted. The Engineer may at his option provide a list or mark the submittal directing the Contractor to the areas that are incomplete.

H. If the Contractor considers any correction indicated on the shop drawings to constitute a change to the Contract Documents, the Contractor shall give written notice thereof to the Engineer at least seven working days prior to release for manufacture.

I. When the shop drawings have been completed to the satisfaction of the Engineer, the Contractor shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the Engineer.

1.8 GENERAL PROCEDURES FOR SUBMITTALS

A. Coordination of Submittal Times: Prepare and transmit each submittal sufficiently in
advance of performing the related work or other applicable activities, or within the time specified in the individual work sections, of the Specifications, so that the installation will not be delayed by processing times including disapproval resubmittal (if required), coordination with other submittals, inspection, testing (off-site and on-site), purchasing, fabrication, delivery and similar sequenced activities. No extension of time will be authorized because of the Contractor's failure to transmit submittals sufficiently in advance of the Work.

1.5 CONTRACTOR'S ORDER OF CONSTRUCTION

A. The Contractor shall submit schedules and reporting information in accordance with the requirements of Section 01310 – Construction Progress Schedules

1.6 CONTRACTOR'S COST BREAKDOWN

A. The Contractor shall submit a schedule of values.

1.7 CERTIFICATE OF DESIGN

A. If specifically specified in other sections of these Specifications, the Contractor shall submit the applicable certification form for each item required, and in the form attached to this section, completely filled in and stamped.
CERTIFICATE OF DESIGN

The undersigned hereby certifies that he/she is a Professional Engineer registered in the state of _______________________ and that he/she has been employed by (Name of Contractor) _________________________ to design ______________________ in accordance with Specifications Section _____ for the (Name Project) __________________________. The undersigned further certifies that he/she has performed similar designs previously and has performed the design of the __________________________; and regulations and professional practice standards; that his/her signature and Professional Engineer (P.E.) Stamp have been affixed to all calculations and drawings used in, and resulting from, the design; and that the use of that stamp signifies the responsibility of the undersigned for that design.

The undersigned hereby certifies that he/she has Professional Liability Insurance and a Certificate of Insurance is attached.

The undersigned hereby agrees to make all original design drawings and calculations available to the Town of Nahant or Owner’s representative with seven (7) days following written request therefore by the Owner.

_________________________________  __________________________________
P.E. Name                                        Contractor’s Name

P.E. Registration Number, State of Registration and Discipline

_________________________________  __________________________________
Signature                                        Signature

_________________________________  __________________________________
Title                                            Title

_________________________________  __________________________________
Address                                         Address

_________________________________  __________________________________
Telephone                                       Telephone

_________________________________  __________________________________
Email Address                                   Email Address

2020 Water Main Improvements
Nahant, MA                                SUBMITTALS
                                             01300-8
PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01300
SECTION 01310

CONSTRUCTION PROGRESS SCHEDULES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

A. CONTRACTOR shall prepare and submit to ENGINEER for review within 30 days after Notice to Proceed, a construction progress schedule.

1.3 FORM OF SCHEDULES

A. Prepare schedules in form of a horizontal bar chart.
   1. Provide separate horizontal bar for each trade or operation.
   2. Horizontal time Scale: Identify first work date of each week.
   3. Scale and spacing to allow space for notations and future revisions.

B. Format of Listings: Chronological order of start of each item of work.

C. Identification of Listings: By major specification section numbers.

1.4 CONTENT OF SCHEDULES

A. Construction Progress Schedule:
   1. Show complete sequence of construction by activity.
   2. Show dates for beginning and completion of each major element of construction and installation dates for major items of equipment. Elements shall include, but not be limited to, the following:
      a. Shop drawing receipt from supplier/manufacturer submitted to ENGINEER, review and return to supplier/manufacturer.
      b. Material and equipment order, manufacturer, delivery and installation, and checkout.
      c. Performance tests and supervisory services activity.
      d. Piping installation.
      e. Utility coordination.
      f. Bypass setup.
g. Connection of water services.
h. Backfilling, grading, seeding, sodding, landscaping, and paving.
i. Abandonment of existing utilities.
j. Final cleanup.
k. Allowance for inclement weather.

3. Show projected percentage of completion for each item as of first day of each month.

1.5 SCHEDULE REVISIONS

A. Every 30 days CONTRACTOR shall revise construction schedule to reflect changes in progress of work.

B. Indicate progress of each activity at date of submittal.

C. Show changes occurring since previous submittal of schedule.
   1. Major changes in scope.
   2. Activities modified since previous submittal.
   3. Revised projects of progress and completion.
   4. Other identifiable changes.

D. Provide a narrative report as needed to define.
   1. Problem areas, anticipated delays, and impact on schedule.
   2. Corrective action recommended and its effect.
   3. Effect of changes on schedules of other CONTRACTORS.

1.6 SUBMITTAL REQUIREMENTS

A. For initial submittal of construction schedule and subsequent revisions thereof, furnish six (6) copies of schedule to ENGINEER.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01310
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

A. As Built Drawings:

The Contractor shall maintain and keep a record copy of as-built drawings. The drawings shall show all materials as installed. A minimum of two (2) swingties to permanent structures shall be shown for all fittings, valves, corporation stops and any other item which will be backfilled upon completion of the work. As-built drawings shall be kept current and will be reviewed monthly. Failure to maintain current as-built drawings will be cause to delay progress payments. As-built drawings shall be available to the Engineer at all times during the life of the Contract. Upon request, the Owner will provide one set of reproducibles of the original Contract Drawings and a sample record drawing showing required style and quality, for this purpose.

General Contractor shall be responsible for coordinating, collecting and updating as-built drawings from subcontractors.

All drawings shall be made a part of the record drawings and shall include the following:

Contract Drawings: Annotate or redraft, as required, to show all revisions, substitutions, variations, omissions and discrepancies made or discovered during construction concerning location and depth of utilities, piping, ductbanks, conduits, manholes, valves, vaults and other equipment. Revisions shall be made and shown on all drawing views with actual dimensions established to permanent points.

Prior to preliminary inspection, furnish a reproducible copy of the record drawings. At the completion of the Contract and before final payment is made, furnish the Engineer one hard copy set of reproducibles, one pdf copy, and one copy of the AutoCAD file of the finally approved record drawings reflecting all revisions herein described.

PART 2 - PRODUCTS (NOT USED)
PART 3 – EXECUTION (NOT USED)

END OF SECTION 01346
SECTION 01400
QUALITY CONTROL

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section includes quality assurance and control of installation and manufacturer’s field services and reports.

1.2 RELATED TECHNICAL SECTION

A. Section 01200 – General Requirements for Utility Work
B. Section 02210 – Earth Excavation, Backfill, Fill, and Grading

1.3 WATERTIGHTNESS

A. All structures, pipes, and equipment which are to contain water shall be watertight under all operating conditions for which they are intended. The Contractor shall furnish all labor, materials and equipment and do all work required by the Engineer to make all such parts of the work watertight, or to replace them if in the opinion of the Engineer any leakage is excessive. All such parts of the work filled with water for testing watertightness shall be left filled as required by the Engineer.

1.4 LAYOUT OF WORK

A. The Contractor shall employ a Massachusetts Registered Land Surveyor acceptable to the Engineer and direct him to establish an initial "Construction Base Line" as indicated on the Drawings. Said base line shall be staked at 25 foot stations. The Engineer shall also provide bench mark information on the Drawings or separately in writing. The Contractor shall do all layout of the work from said base line and bench marks.

B. The Contractor shall employ a Massachusetts Registered Land Surveyor approved by the Engineer and cause him to establish permanent bench marks during the entire progress of the work, to which easy access may be made to determine and assure all lines and grades and to verify same from time to time. The Contractor shall keep on the job a level and transit and allow the Owner's Representative and the Engineer unrestricted use of same at the work site. Such check shall not be considered as approval of the Contractor's work.

C. The Contractor shall maintain the construction base line stakes at all times. Should stakes or marks be destroyed during the course of the work, by the Contractor or by others, the Contractor shall, at his own expense, provide the services of a Massachusetts Registered Land Surveyor, acceptable to the Engineer, to reestablish such stakes and marks.
1.5 CARE OF WATERCOURSES

A. The Contractor shall maintain the flow in all watercourses, whether open channels or in pipes, in all sewers and other pipes interfered with in the line of work and convey the flow to a suitable point of discharge so as not to flow upon the work or create a nuisance. In the discharge of water removed from the excavations by pumping or by gravity similar precautions shall be observed as well as those outlined in specifications relating to contaminated and hazardous materials.

1.6 HYDRANTS

A. Fire hydrants on or adjacent to the work shall be kept accessible to fire-fighting equipment at all times.

1.7 MANUFACTURER’S FIELD SERVICES AND REPORTS

A. When specified in individual specification sections, provide material or product supplier’s or manufacturer’s technical representative to observe site conditions; conditions of surfaces and installation; quality of workmanship; start-up of equipment; operator training, testing, adjustment, and balance of equipment as applicable; and to initiate operation, as required. Conform to minimum time requirements for start-up operations and operator training if defined in specification sections.

B. At the Owner’s or Engineer’s request, submit qualifications of the manufacturer’s representative 15 days in advance of required representative’s service. The representative shall be subject to approval of the Owner and Engineer.

C. Manufacturer’s representative shall report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer’s written instructions. Submit reports within 14 days of observation to Engineer for review.

1.8 TESTING LABORATORY SERVICES

A. All tests which require the services of a laboratory to determine compliance with the Contract Documents, shall be performed by an independent commercial testing laboratory acceptable to the Engineer. The laboratory shall be staffed with experienced technicians, properly equipped, and fully qualified to perform the tests in accordance with the specified standards.

B. Preliminary Testing Services: Unless otherwise specified, the Contractor shall be responsible for all testing laboratory services in connection with concrete materials and mix designs, the design of asphalt mixtures, gradation tests for structural and embankment fills, backfill materials, and all other tests and engineering data required for the Engineer’s review of materials and
equipment proposed to be used in the Work. The Contractor shall obtain the Engineer's acceptance of the testing laboratory before having services performed and shall pay all costs for services.

C. Quality Control Testing Services: Perform all quality control tests in the field or in the laboratory on concrete, asphalt mixtures, moisture-density (Proctor) and gradation tests on structural and embankment fills, and backfill materials, in-place field density tests on structural and embankment fills, and other materials and equipment, during and after their incorporation in the Work. Field sampling and testing shall be performed in the general manner indicated in the specifications, with minimum interference with construction operations. The Engineer shall determine the exact time and location of field sampling and testing and may require such additional sampling and testing as necessary to determine that materials and equipment conform with data previously furnished by Contractor and with the Contract Documents.

D. Arrangements for delivery of samples and test specimens to the testing laboratory will be made by the Contractor. The laboratory tests shall be performed within a reasonable time consistent with the specified standards. Furnish a written report of each test to the Engineer.

E. Contractor shall furnish all sample materials and cooperate in the sampling and field testing activities, interrupting the Work when necessary. When sampling or testing activities are performed in the field, the Contractor shall furnish personnel and facilities to assist in the activities.

F. The Contractor shall not retain any testing laboratory against which the Owner or the Engineer have reasonable objection, and if at any time during the construction process the services become unacceptable to the Owner, or the Engineer, either the Owner or the Engineer may direct in writing that such services be terminated. The request must be supported with evidence of improper testing or unreasonable delay. If the Engineer determines that sufficient cause exists, the Contractor shall terminate the services and engage a different testing laboratory.

G. Transmittal of Test Reports: Written reports of testing and engineering data furnished by the Contractor for the Engineer's review of materials and equipment proposed to be used in the Work shall be submitted as specified for Shop Drawings.

H. The testing laboratory shall furnish four copies of a written report of each test performed by laboratory personnel in the field or laboratory to the Contractor. Distribution shall be two copies of each test report to the Engineer's Representative, one copy to the Owner, and one copy for the Contractor within three days after each test is completed.

1.9 MATERIALS AND EQUIPMENT

A. The Contractor shall maintain control over procurement sources to ensure that
materials and equipment conform to specified requirements in the Contract Documents.

B. The Contractor shall comply with manufacturer’s printed instructions regarding all facets of materials and/or equipment movement, storage, installation, testing, startup, and operation. Should circumstances occur where the contract documents are more stringent than the manufacturer’s printed instructions, the Contractor shall comply with the specifications. In cases where the manufacturer’s printed instructions are more stringent than the contract documents, the Contractor shall advise the Engineer of the disparity and conform to the manufacturer’s printed instructions. In either case, the Contractor is to apply the more stringent specification or recommendation, unless approved otherwise by the Engineer.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01400
PART 1 - GENERAL

1.1 PLANT

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

1.2 SUBMITTALS

A. The Contractor shall submit a complete work plan including: proposed hours of operation, sequencing of work, number of shifts, number of work crews, and anticipated conflicts with existing utilities and facilities throughout the project. The work plan shall also include dates for temporary facility service interruption and required utility relocation. The plan shall also include a detailed schedule of all cooperation requirements with owners/operators of existing utilities and facilities.

1.3 PRIVATE LAND

A. The Contractor shall not enter or occupy private land outside of easements, except by permission of the Owner through right of entry documents.

1.4 PIPE LOCATIONS

A. Pipelines shall be located substantially as indicated on the Drawings, but the Engineer reserves the right to make such modifications in locations as may be found desirable to avoid interference with existing utilities, structures or for other reasons.

B. Where fittings 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.

1.5 HAULING, HANDLING AND STORAGE OF MATERIALS
A. The Contractor shall, at his own expense, handle and haul all materials furnished by him and shall remove any of his surplus materials at the completion of the work. The Contractor shall provide suitable and adequate storage for equipment and materials furnished by him and shall be responsible for any loss or damage to any equipment or materials by theft, breakage, or otherwise. The Contractor shall be responsible for all damages to the work under construction during its progress and until final completion and acceptance even though partial payments have been made under the Contract.

1.6 OPEN EXCAVATIONS

A. All open excavations shall be adequately safeguarded by providing temporary barricades, steel plates, construction and caution signs, concrete barriers, protective 7’ tall fencing, lights and other means to prevent accidents to persons, vehicles, and damage to property. The Contractor shall, at his own expense, provide suitable and safe means for completely covering all open excavations and for accommodating pedestrian and/or vehicular travel when work is not in progress. Bridges provided for access to private property during construction shall be removed when no longer required. The length of open trench will be controlled by the particular surrounding conditions but shall always be confined to the limits prescribed by the Engineer. If the excavation becomes a hazard, or if it excessively restricts traffic at any point, then special construction procedures shall be taken, such as limiting the length of open trench.

1.7 TEST PITS

A. Test pits for the purpose of locating underground pipeline or structures in advance of the construction shall be excavated and backfilled by the Contractor in accordance with the requirements of the Engineer, as shown on the Drawings, or described in the Specifications, or as directed by the Owner or Engineer. Test pits shall be backfilled and compacted immediately after their purpose has been completed and the surface restored and maintained as required by the Engineer.

1.8 PROTECTION AND RELOCATION OF EXISTING STRUCTURES AND UTILITIES

A. The Contractor shall assume full responsibility for the protection of all buildings, structures, and utilities, public or private, including, but not limited to, poles, signs, services to buildings, utilities in the street, gas pipes, water pipes, hydrants, sewers, drains, and electric and telephone cables, fiber optic lines, fire signals, cable television cables, whether or not they are shown on the Drawings. The Contractor shall carefully support and protect all such structures and utilities from injury of any kind. The Contractor shall notify the owner/operator of the proposed work and proposed protection plan so the owner/operator can review and approve protection measures. The Contractor is
required to comply with all provisions of Massachusetts General Laws Chapter 353 entitled "Excavations-Public Ways-Notice Requirements" otherwise known as Dig Safe. Any damage resulting from the Contractor's operations shall be repaired by him at his expense.

B. The Contractor shall bear full responsibility for obtaining all locations of underground structures, utilities, and services. Services to buildings shall be maintained and all costs or charges resulting from damage thereto shall be paid by the Contractor.

C. Protection and temporary removal and replacement of existing utilities and structures as described in this section shall be a part of the work under the Contract. The Contractor will be responsible for the removal and replacement of existing utilities or coordination with the owners/operators of the existing utilities and assisting the existing utilities where required.

D. If, in the opinion of the Engineer, permanent relocation of a utility owned by the City of Somerville is required, that is not shown on the plans or the specifications; he may require the Contractor, in writing, to perform the work. Work so ordered will be paid for as extra work under provisions of the General Conditions. If relocation of a privately owned utility is required, the Contractor will notify the utility to perform the work as expeditiously as possible. The Contractor shall fully cooperate with the Owner and utility, and shall have no claim for delay due to such relocation. The Contractor shall notify public utility companies in writing at least seven days (excluding Saturdays, Sundays and legal holidays) before excavating or working in any public way. The Contractor shall notify public utilities 30 days prior to any service call wherever possible.

1.9 WATER FOR CONSTRUCTION PURPOSES

A. The Contractor will be allowed to purchase water from the Owner for construction testing and start-up purposes.

B. The express approval of the Nahant Department of Public Works shall be obtained before water is used. Water shall be metered as specified by the Nahant Department of Public Works. Hydrants shall only be operated under the supervision of Nahant Department of Public Works personnel. Meters and backflow preventers shall be procured from the Nahant Department of Public Works.

C. No direct cross connections will be permitted between the public water supply and the new water mains, or any other point where the possibility of backflow of contaminated water exists. All connections to points where there is the possibility of backflow shall be arranged to prevent backflow and shall be approved by the Department of Public Works before they are put into operation.
1.10 PROTECTION OF CONSTRUCTION AND EQUIPMENT

A. All newly constructed Work shall be carefully protected. No driving or wheeling, walking or placing of heavy loads on newly constructed Work shall be allowed. All portions damaged shall be reconstructed, repaired, or replaced by the Contractor at his own expense.

B. All elements of the Work shall be protected in a manner approved by the Engineer. Should any part of the Work become heaved, cracked, or otherwise damaged, all such damaged portions of the Work shall be completely repaired and made good by the Contractor at his own expense as required by the Engineer.

C. If, in the final or any daily inspection of the Work, any defects, faults or omissions are found, the Contractor shall cause the same to be repaired or removed and replaced by proper materials and workmanship without extra compensation for the materials and labor required. Further, the Contractor shall be fully responsible for the satisfactory maintenance and repair of the construction and other work undertaken herein for at least the guarantee period described in the Contract Documents.

D. The Contractor shall take all necessary precautions to prevent damage to all elements of the Work due to water pressure during and after construction and until such Work is accepted and taken over by the Owner.

1.11 CARE AND PROTECTION OF PROPERTY

A. The Contractor shall be responsible for the preservation of all public and private property and shall use every precaution necessary to prevent damage thereto. If any direct or indirect damage is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the Work on the part of the Contractor, such property shall be restored by the Contractor at his expense to a condition similar or equal to that existing before the damage was done or he shall make good the damage in another manner acceptable to the Owner and Engineer.

B. Along the location of this Work, all fences, walks, bushes, trees, shrubbery, and other physical features shall be protected and restored in a thoroughly workmanlike manner. Fences and other features removed by the Contractor shall be replaced in their original location or at a location indicated on the Drawings as soon as conditions permit. All grass areas beyond the limits of construction which have been damaged by the Contractor shall be graded and seeded.

C. Trees close to the work shall be boxed or otherwise protected against injury. No trees shall be cut, braced, or damaged without prior notification and approval.

D. The protection, removal, and replacement of existing physical features along
the line of work shall be a part of the work under the Contract, and all costs in connection therewith shall be included in the Bid Proposal unless a Bid Item has been established elsewhere in these Construction Documents for the express payment of that specific item of Work.

1.12 INSTALLATION OF EQUIPMENT

A. All wedges, shims, filling pieces, keys, packing, red or white lead grout, or other materials necessary to properly align, level and secure apparatus in place shall be furnished by the Contractor. All parts intended to be plumb or level must be proven exactly so. Any grinding necessary to bring parts to proper bearing after erection shall be done at the expense of the Contractor.

1.13 REJECTED MATERIALS AND DEFECTIVE WORK

A. Materials furnished by the Contractor and condemned by the Engineer as unsuitable or not in conformity with the specifications shall forthwith be removed from the work by the Contractor and shall not be made use of elsewhere in the work. Any errors, defects or omissions in the execution of the work or in the materials furnished by the Contractor, even though they may have been passed or overlooked or have appeared after the completion of the work, discovered at any time before the final payment is made hereunder, shall be forthwith rectified and made good by and at the expense of the Contractor as required by the Owner and Engineer. The Contractor shall reimburse the Owner for any expenses, losses or damages incurred in consequence of any defect, error, omission or act of the Contractor or his employees, as required by the Owner and Engineer, occurring previous to the final payment.

1.14 TEMPORARY UTILITIES

A. Temporary Light and Power: The Contractor shall at his own expense, provide his own temporary light and power as required for the prosecution and completion of work, including light and power for the construction and engineering field office as well as light and power for dewatering pumps, and trench and staging area lighting.

B. Temporary Heat: The Contractor shall, at his own expense, provide sufficient temporary heat to maintain minimum temperatures specified elsewhere, in all areas designated elsewhere in these documents.

D. Temporary Water: Water for drinking purposes and other usage will be provided by the Contractor at his own expense.

E. Sanitary Provisions: The Contractor shall provide and maintain sanitary accommodations for the use of his employees and the Engineer, as may be necessary to comply with the requirements and regulations of the local and state departments of health.
F. Maintaining Operation of the Existing Facilities:

1. The Contractor shall provide temporary utilities and/or cooperate with utilities to maintain full service to the residences and buildings in the project area. The Contractor shall be responsible for careful consideration of the construction scheduling and anticipation of potential interferences with existing utilities, operations and structures. The Contractor shall maintain close communications with the Engineer and provide the Engineer with a detailed description of each proposed activity sufficiently in advance of its commencement for review and comments to be made.

2. Temporary facilities which may be required include, but are not limited to, electrical power; lighting; heating; cooling; ventilating; telephone; cable television; potable water; fire protection; drainage; sanitary facilities; trench covers; protection of existing utilities; structures; streams; trees and shrubs; access roads; sewage conveyance; piping; and pumping. The Contractor will be responsible for providing, connecting, and maintaining emergency generators to serve homes in the event temporary electrical services cannot be established by the power company. The Contractor will be responsible to furnish a licensed electrician to connect the houses to the emergency generators, maintain the generators 24 hours a day, and disconnect the houses when service can be reestablished to the power lines. The generators will be provided and maintained at no additional cost to the Owner.

3. The Contractor shall coordinate efforts with the owners and/or operators of the existing facilities to avoid any service interruption. The Contractor shall keep utilities informed of proposed work activity and notify utilities of required work four weeks in advance. The Contractor must schedule work to avoid repeated, unnecessary, or last minute service calls by the owners/operators of existing facilities.

1.15 ACCESS TO THE WORK

A. The Contractor shall provide sufficient and proper facilities at all times for inspection of all work under this project in preparation or in progress, by the Owner, the agents and employees of the Owner, by authorized representatives of the Commonwealth of Massachusetts and the Federal Government and by the Engineers.

B. The Contractor shall furnish the Engineer, or his authorized representative and other personnel mentioned above, with such facilities and assistance as are necessary to ascertain performance of the work in accordance with the plans and specifications.

C. The Contractor must provide sufficient and safe access to existing facilities for the owners/operators of existing facilities to maintain service.
1.16 POLLUTION CONTROL

A. The Contractor shall conduct clean-up and disposal operations, as necessary, to comply with state and local ordinances and anti-pollution laws.

B. Outdoor burning of rubbish and waste material on the site will not be permitted.

C. Disposal of volatile fluid wastes (such as mineral spirits, oil, gasoline, or paint thinner) in storm, combined, or sanitary sewer systems or into streams or waterways is not permitted.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01500
PART 1 - GENERAL

1.1 DESCRIPTION

A. This section includes temporary environmental controls necessary for the project including dust abatement, rubbish control, sanitation, chemicals, and cultural resources. Snow removal and sweeping of streets and sidewalks are discussed in Section 01570 - MAINTENANCE AND PROTECTION OF TRAFFIC.

1.2 RELATED TECHNICAL SECTIONS

A. Section 01570 - MAINTENANCE AND PROTECTION OF TRAFFIC

B. Section 02080 – SOIL AND WASTE MANAGEMENT

1.3 DUST ABATEMENT AND CONTROL

A. The Contractor shall prevent its operation from producing dust in amounts damaging to property, cultivated vegetation, or domestic animals, or causing a nuisance to persons living in or occupying buildings in the vicinity. The Contractor is responsible for any damage resulting from dust originating from its operations. The dust abatement measures are to be continued until the Contractor is relieved of further responsibility for the Work. Dust abatement measures are to include but not be limited to spraying water, applying calcium chloride, or placing temporary pavement on and around trenches and at work sites.

B. During excavation of soil/fill material, dust is required to be controlled to limit potential spread of contaminants and potential exposure of contaminants to workers and the public.

C. Ambient dust levels at the site are to be monitored by the Contractor prior to construction. During construction, real-time dust monitoring is to be conducted during any soil/fill handling activities. The monitoring to consist of total dust testing using MIE, Inc. Miniram PDM-3 Dust Monitors, or like instruments. The total dust criteria at the site to conform to the requirements of the Health And Safety Plan (HASP). Should fugitive dust quantities exceed 20 percent of the ambient level, the Contractor to perform additional measures to reduce the total dust
concentrations.

D. Nuisance dust levels may be encountered during regrading activities and excavation. Dust levels are to be reduced by pre-wetting the surface soils and by establishing and maintaining clean access roads. The Contractor's Dust, Vapor, and Odor Control Plan shall describe the procedures and materials to minimize dust. The Contractor shall refer to Section 02080 - SOIL AND WASTE MANAGEMENT for the Dust, Vapor and Odor Control Plan submittal requirements. At a minimum, the Contractor shall provide clean water, free from salt, oil, and other deleterious materials.

E. Areas of exposed earth to be excavated shall be lightly sprayed with water before excavation. Additional water spray may be utilized only when any indication of excessive dust is observed. The Contractor shall minimize the use of water within the limits of excavation.

F. Access roads shall be sprayed with water and/or calcium chloride on a regular basis to minimize the generation of dust.

G. In addition to the mechanical and hand sweeping performed daily by the Contractor, the Contractor shall employ a professional sweeper to power sweep the Project area at completion of construction.

1.3 RUBBISH CONTROL

A. During the progress of the Work, the Contractor shall keep the Site and other areas used by it in a neat and clean condition and free from any accumulation of rubbish. The Contractor shall dispose of all rubbish and waste materials of any nature occurring at the Site and shall establish regular intervals of collection and disposal of such materials and waste. The Contractor shall also keep its haul roads free from dirt, rubbish, and unnecessary obstructions resulting from its operations. Disposal of all rubbish and surplus materials shall be off the Site in accordance with local codes and ordinances governing locations and methods of disposal, and in conformance with all applicable safety laws, and to the particular requirements of Part 1926 of the OSHA Safety and Health Standards for Construction.

B. In the event that the Contractors work zone restricts trash or recycling collection or makes it difficult for residents to bring trash or recycling to the street, the Contractor shall collect all trash and recycling within the work zone and transport it outside the work zone for municipal collection. Return trash and recycling receptacles back to respective properties.
1.4 SANITATION

A. Toilet Facilities: Fixed or portable chemical toilets shall be provided wherever needed for the use of employees. Toilets at construction job sites shall conform to the requirements of Part 1926 of the OSHA Standards for Construction.

B. Sanitary and Other Organic Wastes: The Contractor shall establish a regular daily collection of all sanitary and organic wastes. All wastes and refuse from sanitary facilities provided by the Contractor or organic material wastes from any other source related to the Contractor's operations shall be disposed of away from the Site in a manner satisfactory to the Work and in accordance with all laws and regulations pertaining thereto.

1.5 CHEMICALS

A. All chemicals used during project construction or furnished for project operation, whether defoliant, soil sterilant, herbicide, pesticide, disinfectant, polymer, reactant or of other classification, shall show approval of either the U.S. Environmental Protection Agency or the U.S. Department of Agriculture. Use of all such chemicals and disposal of residues shall be in strict accordance with the printed instructions of the manufacturer.

1.6 CULTURAL RESOURCES

A. The Contractor’s attention is directed to the National Historic Preservation Act of 1966 (16 U.S.C. 470) and 36 CFR 800 which provides for the preservation of potential historical architectural, archaeological, or cultural resources (hereinafter called “cultural resources”).

B. The Contractor shall conform to the applicable requirements of the National Historic Preservation Act of 1966 as it relates to the preservation of cultural resources.

C. In the event potential cultural resources are discovered during subsurface excavations at the site of construction, the following procedures shall be instituted:

1. The Engineer will issue a Field Order requiring the Contractor to cease all construction operations at the location of such potential cultural resources find.

2. Such Field Order shall be effective until such time as a qualified archaeologist can be called to assess the value of these potential cultural resources and make recommendations to the State Historic Preservation Office.
D. If the archaeologist determines that the potential find is a bona fide cultural resource, at the direction of the State Historic Preservation Office, the Contractor shall suspend work at the location of the find under the provisions for changes contained in the General Conditions.

1.7 NOISE CONTROL

A. The Contractor shall make every effort to minimize noises caused by his/her operations. Equipment shall be equipped with silencers or mufflers designed to operate with the least possible noise in compliance with State and Federal (OSHA) regulations.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01560
SECTION 01568
EROSION CONTROL, SEDIMENTATION AND CONTAINMENT
OF CONSTRUCTION MATERIALS

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Contractor shall provide all work and take all measures to control soil erosion resulting from construction operations, prevent flow of sediment from construction site.

1.2 SUBMITTALS

A. Shop Drawings: Submit the following in accordance with Section 01300 - SUBMITTALS:

1. Two weeks prior to the start of the work, the Contractor shall submit for review, a plan with detailed sketches showing the proposed methods to be used for controlling erosion during construction.

2. Contractor shall submit manufacturer’s literature describing products, installation procedures, and routine maintenance of the sediment filter device.

1.3 QUALITY ASSURANCE

A. Use acceptable procedures, including water diversion structures, diversion ditches, settling basins, composting socks, and sediment filter devices.

B. Operations restricted to areas of work indicated on Contract Drawings.

C. If construction materials are washed away during construction, contractor shall remove materials from fouled areas.

PART 2 – PRODUCTS

2.1 STRAW WATTLES

A. Wattles shall be a straw-filled tube of flexible netting material exhibiting the following properties. It shall be a machine-produced tube of compacted rice straw that is Certified Weed Free Forage, by a manufacturer whose principle business is wattle manufacturing. The netting shall consist of seamless, high-density polyethylene and ethyl vinyl acetate and contain ultra violet inhibitors.
B. Light weight rolled erosion control straw or wood fiber blankets (RECB) rolled up to create a wattle type device shall not be allowed under this specification.

C. The Wattle shall meet the minimum performance requirements of Table 1. The product must be guaranteed to meet all numeric performance values in Table 1 under the specific conditions as stated.

<table>
<thead>
<tr>
<th>Property</th>
<th>Test Method</th>
<th>Units</th>
<th>Min. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass per Unit Weight</td>
<td>Field Measured</td>
<td>(lbs/ft)</td>
<td>1.6</td>
</tr>
<tr>
<td>Dimension</td>
<td>Field Measured</td>
<td>(Dia/Inches)</td>
<td>8.0 - 9.0</td>
</tr>
<tr>
<td>Net Strand Thickness</td>
<td>Field Measured</td>
<td>(Inches)</td>
<td>0.030</td>
</tr>
<tr>
<td>Net Knot Thickness</td>
<td>Field Measured</td>
<td>(Inches)</td>
<td>0.055</td>
</tr>
<tr>
<td>Netting Unit Weight</td>
<td>Certified</td>
<td>(Ounces/ft)</td>
<td>0.35</td>
</tr>
<tr>
<td>Sediment Capacity Retention</td>
<td>Rainfall Sim. 1</td>
<td>(lbs/ft)</td>
<td>30</td>
</tr>
<tr>
<td>Installed Free-Board Ht.</td>
<td>Field Measured</td>
<td>(Height/Inches)</td>
<td>6.0 — 7.0</td>
</tr>
<tr>
<td>Straw Fiber</td>
<td>Field Measured</td>
<td>Avg. Length (in)</td>
<td>3.0</td>
</tr>
<tr>
<td>Soil Loss¹</td>
<td>Rainfall Sim. 1</td>
<td>% Effectiveness</td>
<td>58²</td>
</tr>
<tr>
<td>De-Stabilizing Moisture</td>
<td>Rainfall Sim. 1</td>
<td>% Retained (Max.)</td>
<td>11</td>
</tr>
<tr>
<td>Fiber Content</td>
<td>Certified</td>
<td>% Rice Straw</td>
<td>100</td>
</tr>
</tbody>
</table>

D. Straw wattles shall be manufactured by R.H. Dyck, Inc., Greenfix America LLC, California Straw Works, or approved equal.

2.2 WOOD STAKES

A. 1-inch by 1-inch by 3-feet.
2.3 SILT SACK

A. Provide woven polypropylene fabric bags to prevent sediment from entering existing catch basins. Bags shall be manufactured by ACF Environmental or equal. Polypropylene fabric shall meet or exceed the following characteristics:

<table>
<thead>
<tr>
<th>Property</th>
<th>Standard</th>
<th>Minimum Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grab tensile strength</td>
<td>ASTM D-4632</td>
<td>300 lbs</td>
</tr>
<tr>
<td>Grab tensile elongation</td>
<td>ASTM D-4632</td>
<td>20%</td>
</tr>
<tr>
<td>Puncture</td>
<td>ASTM D-4833</td>
<td>120 lbs</td>
</tr>
<tr>
<td>Mullen Burst</td>
<td>ASTM D-3786</td>
<td>800 psi</td>
</tr>
<tr>
<td>Trapezoid tear</td>
<td>ASTM D-4533</td>
<td>120 lbs</td>
</tr>
<tr>
<td>UV resistance</td>
<td>ASTM D-4355</td>
<td>80%</td>
</tr>
<tr>
<td>Apparent opening size</td>
<td>ASTM D-4751</td>
<td>40 US sieve</td>
</tr>
<tr>
<td>Flow rate</td>
<td>ASTM D-4491</td>
<td>40 gpm/sf</td>
</tr>
<tr>
<td>Permittivity</td>
<td>ASTM D-4491</td>
<td>0.55 /sec</td>
</tr>
</tbody>
</table>

PART 3 – EXECUTION

3.1 GENERAL

A. The Contractor shall not discharge chemicals, fuels, lubricants, bitumen, raw sewage, and other harmful waste into or alongside any body of water or into natural or manmade channel.

B. It is the intent of these Specifications to prevent the unnecessary occurrence of sedimentation or siltation of waterways and private properties. In the event the sedimentation or siltation prevention measures used by the Contractor prove to be inadequate as determined by the Owner and Engineer, the Contractor shall be required to adjust his operations to the extent necessary to prevent any such sedimentation or siltation from occurring.

3.2 INSTALLATION

A. Install sedimentation barriers in all locations as directed, surrounding base of all deposits of stored excavated material outside of disturbed area, and where directed by the Engineer.

B. Install sedimentation barriers immediately after site is cleared and before trench excavation. Locate sedimentation barriers, surrounding stored material, approximately 6 ft. from material.

C. Protect catch basins from sedimentation by installing silt sacks under grating casting.
D. Discharge silt-laden water from excavations through a siltation bag to ensure that only sediment-free water is returned to watercourses.

E. Do not place excavated soil material adjacent to water-course in manner that will cause it to wash away by high water or runoff.

F. Prevent damage to vegetation by excessive watering or silt accumulation in the discharge area.

G. Do not dump spoiled material into any streams, wetlands, surface waters, or unspecified locations.

H. Prevent indiscriminate, arbitrary, or capricious operation of equipment in streams, wetlands or surface waters.

I. Do not pump silt-laden water from trenches or excavations into surface waters, streams, wetlands, or natural or man-made channels leading thereto.

J. Prevent damage to vegetation adjacent to or outside of construction area limits.

K. If required by regulatory authorities, provide a portable filtration system to prevent sediment-laden runoff from occurring in areas adjacent to wetlands or buffer zones.

L. Do not dispose of trees, brush, debris, paints, chemicals, asphalt products, concrete curing compounds, fuels, lubricants, insecticides, washwater from concrete trucks or hydroseeders, or any other pollutant in streams, wetlands, surface waters, or natural or man-made channels leading thereto, or unspecified locations.

M. Do not alter flow line of any stream unless indicated or specified.

N. Clean and dispose of debris from sedimentation barriers on a weekly basis.

O. Upon completion of work and upon approval of Conservation Commission and Engineer, remove and dispose of sedimentation barriers.

P. Clean catch basins, which have become silted-up due to construction.

PART 4 – COMPENSATION (Not Used)
SECTION 01610
DELIVERY, STORAGE AND HANDLING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

A. This section specifies the general requirements for the delivery, handling, storage and protection for all items required in the construction of the work. Specific requirements, if any, are specified with the related item.

1.3 TRANSPORTATION AND DELIVERY

A. Transport and handle items in accordance with manufacturer's printed instructions.

B. Schedule delivery to reduce long term on-site storage prior to installation and/or operation. Under no circumstances shall equipment be delivered to the site more than one month prior to installation without written authorization from the Engineer.

C. Coordinate delivery with installation to ensure minimum holding time for items that are hazardous, flammable, easily damaged or sensitive to deterioration.

D. Deliver products to the site in manufacturer's original sealed containers or other packing systems, complete with instructions for handling, storing, unpacking, protecting and installing.

E. All items delivered to the site shall be unloaded and placed in a manner which will not hamper the Contractor's normal construction operation or those of subcontractors and other contractors and will not interfere with the flow of necessary traffic.

F. Provide equipment and personnel to unload all items delivered to the site.
G. Promptly inspect shipment to assure that products comply with requirements, quantities are correct, and items are undamaged. For items furnished by others (i.e. Owner, other Contractors), perform inspection in the presence of the Engineer. Notify Engineer verbally, and in writing, of any problems.

1.4 STORAGE AND PROTECTION

A. Store and protect products in accordance with the manufacturer's printed instructions, with seals and labels intact and legible. Storage instruction shall be studied by the Contractor and reviewed with the Engineer by him. Instructions shall be carefully followed and a written record of this kept by the Contractor. Arrange storage to permit access for inspection.

B. Store loose granular materials on solid flat surface in a well-drained area. Prevent mixing with foreign matter.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01610
SECTION 01630

RESTORATION OF GROUNDS AND CLEANING UP

PART 1 - GENERAL

1.1 REQUIREMENTS

A. The Contractor on or before the completion of the work, except as otherwise expressly required or permitted in writing by the Owner, shall tear down and remove and legally dispose of all temporary structures built or used by him; shall remove all rubbish and debris of all kinds from all Contract structures and from any grounds which he shall have occupied within the limits of the project site; shall leave the site of the work in a satisfactorily neat and clean condition; shall remove from the land all abandoned materials and plant; and shall leave the spoil areas and the property which may have been affected by his operations in a neat and satisfactory condition. Also included is the restoration of all private grounds, including lawns, landscaped areas, driveway aprons and walkways damaged or disturbed in connection with the new work not elsewhere specified. Unless otherwise specified, all materials salvaged and not required to be reused shall be the property of the Contractor, and shall be legally disposed of off the site of the work.

B. Included in the work under this Section is the restoration, including replacement of damaged and disturbed shrubs and trees, retaining walls, of all grounds and grassed and landscaped areas removed or disturbed or damaged during the construction of the new work, including pipe laterals within private property areas, and storage and field office areas.

C. Also included in the work under this Section is the furnishing of all labor, materials, and equipment required to remove, store, and reset or replace bumper posts, stone walls of all types, flagstone, brick, concrete, asphalt walks, fences of all types, railings, signs and sign posts, signal posts, mailboxes and such other miscellaneous objects damaged or disturbed during construction.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01630
SECTION 01701
PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section includes the requirements for project closeout including final cleanup, closeout timetable, Owner’s manual submittal, final submittals, maintenance and guarantee, and bonds.

1.2 FINAL CLEANUP

A. The Contractor shall promptly remove from the vicinity of the completed work, all rubbish, unused materials, concrete forms, construction equipment, and temporary structures and facilities used during construction according to Specification Section 01630 – Restoration of Grounds and Cleaning Up. Final acceptance of the Work by the Owner will be withheld until the Contractor has satisfactorily complied with the foregoing requirements for final cleanup of the project site.

B. The Contractor shall cleanup and restore all areas affected by staging, trailer(s) placement and parking. Restoration includes regrading, re-establishing topsoil and reseeding.

1.3 CLOSEOUT TIMETABLE

A. The Contractor shall establish dates for equipment testing, acceptance periods, and on-site instructional periods (as required under the Contract). Such dates shall be established as specified elsewhere in the Contract Documents.

1.4 FINAL SUBMITTALS

A. The Contractor, prior to requesting final payment, shall obtain and submit the following items to the Engineer for transmittal to the Owner:

1. Written guarantees, where required.

2. Maintenance stock items; spare parts; special tools.

3. Completed as-built / record drawings as described in Section 01346.

4. Certificates of inspection and acceptance by local governing agencies having jurisdiction.

5. Releases from all parties who are entitled to claims against the subject
1.6 MAINTENANCE AND GUARANTEE

A. The Contractor shall comply with the guarantee and warranty requirements contained in the General Conditions.

B. Replacement of earth fill or backfill, where it has settled below the required finish elevations, shall be considered as a part of such required repair work, and any repair or resurfacing constructed by the Contractor which becomes necessary by reason of such settlement shall likewise be considered as a part of such required repair work unless the Contractor shall have obtained a statement in writing from the affected private owner or public agency releasing the Owner from further responsibility in connection with such repair or resurfacing.

C. The Contractor shall make all repairs and replacements promptly upon receipt of written order from the Owner. If the Contractor fails to make such repairs or replacements promptly, the Owner reserves the right to do the Work and the Contractor and his surety shall be liable to the Owner for the cost thereof.

1.7 BOND

A. The Contractor shall provide a bond to guarantee performance of the provisions contained in Paragraph "Maintenance and Guarantee" above, and of the General Conditions.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 01701
SECTION 02010

SUBSURFACE INVESTIGATION

PART I – GENERAL

1.1 DESCRIPTION

A. This section includes the basic requirements and expectations of the Contractor in all work pertaining to subsurface conditions.

1.2 GENERAL REQUIREMENTS

A. The Contractor acknowledges that he has satisfied himself as to the nature and location of the Work; the general and local conditions, particularly those bearing upon groundwater table or similar physical conditions at the site; the characterization and conformation of subsurface materials to be encountered; and all other matters that can in any way affect the work or the cost thereof under this Contract. Any failure by the Contractor to acquaint himself with all available information concerning these conditions will not relieve him from responsibility for estimating properly the difficulty or cost of successfully performing the Work.

1.3 SUBSURFACE DATA

A. Such data is offered in good faith solely for the purpose of placing the Contractor in receipt of information available. The Contractor shall interpret such data according to their own judgment and acknowledges that they are not relying upon the same as accurately describing the actual subsurface conditions or quantities of materials that may be encountered. The Contractor further acknowledges that he assumes all risk contingent upon the nature of the subsurface conditions to be actually encountered in performing the work covered by the Contract, even though such actual conditions may result in the Contractor performing more or less work than originally anticipated. In the event that quantities of waste soil/fill and related work as established in this Contract vary significantly from estimates provided, the unit bid prices will be the basis for compensation.

C. Prior to submitting a bid, the Contractor shall review and understand the information contained in the geotechnical data and all Contract Documents.

D. Re-use of excavated soils on- or off-site is subject to local, state and federal regulations and as specified in Section 02080 – SOIL AND WASTE MANAGEMENT and 02095 – TRANSPORTATION AND DISPOSAL OF SOIL AND FILL.
E. Additional subsurface investigation as may be warranted to satisfy a disposal facility’s data requirements shall be the responsibility of the Contractor. Subsurface investigation activities shall not commence until a written work plan detailing the Contractor’s approach for obtaining the data is approved by the Owner’s Licensed Site Professional. The work plan must indicate the location and frequency of sampling; sampling parameters and sampling methodology. The Contractor shall allow a minimum of 14 days for review and comment.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – COMPENSATION (Not Used)

END OF SECTION 02010
PART 1 – GENERAL

1.1 DESCRIPTION

A. The Contractor shall furnish all plant, labor, tools, equipment, materials, and supplies as required for utility and structure removal, demolition, modification, and/or abandonment as specified.

B. The work of this Section shall include the following significant items; all other activity shown on the Drawings; and work necessary and defined herein pertaining to the project area: removal of pavement; removal of existing manholes; removal of existing pipe; and selective demolition.

1.2 RELATED TECHNICAL SECTIONS

A. Section 02080 – SOIL AND WASTE MANAGEMENT

B. Section 02095 – TRANSPORTATION AND DISPOSAL OF SOIL AND FILL

C. Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING

D. Section 02160 – TEMPORARY EXCAVATION SUPPORT SYSTEMS

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01300 – SUBMITTALS:

1. Removal and abandonment procedures that shall provide for safe conduct of the Work, careful removal and disposition of materials and equipment, protection of utilities, structures, property, or other features which are to remain undisturbed and coordination with existing utilities or owners responsible for those nearby elements to remain in service.

2. A detailed work plan to include a list of items to be removed and/or abandoned, a sequence and schedule, and a list of salvageable materials and equipment.

3. Proposed Dust-Control and Noise-Control Measures: Submit
statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate.

4. Schedule of Selective Demolition, Modification and Abandonment Activities subject to approval by the Owner and Engineer. Indicate the following:

a. Detailed sequence of selective demolition, modification and abandonment work, with starting and ending dates for each activity. Ensure the Owner’s operations are uninterrupted.

b. Interruption of utility services.

c. Coordination for shutoff, capping, bulkheading and continuation of utility services.

d. Proposed materials, construction details, locations of temporary utilities, abandonment materials, and means of access.

e. Coordination of Owner’s continuing use of portions of utilities, structures, property or other features and of Owner's partial occupancy of completed Work.

5. Additional Submittals for Selective Demolition, Modification, and Abandonment Activities

a. Inventory: After selective demolition or modifications are complete, submit a list of items that have been removed and salvaged.

b. Pre-demolition Photographs or Videotape: Show existing conditions of adjoining utility construction and site improvements that might be misconstrued as damage caused by selective demolition or modification operations. Submit before Work begins.

c. Landfill Records: Indicate receipt and acceptance of all wastes by disposal facility licensed to accept the wastes to be disposed.

6. Plugs and Bulkheads
a. If temporary pneumatic or hydro plugs are proposed the Contractor shall submit the method and procedure of maintaining bladder pressure.

1.4 REPAIR OF DAMAGE

A. Any damage to existing facilities to remain, as caused by the Contractor's operations shall be repaired at no additional cost to the Owner.

B. Damaged items shall be repaired or replaced with new materials as required to restore damaged items or surfaces to a condition equal to and matching that existing prior to damage or start of work of this Contract.

1.5 PROTECTION OF EXISTING WORK

A. Before beginning any cutting, trenching or demolition work, the Contractor shall carefully review the work sequence and examine the Drawings and Specifications to determine the extent of the Work. The Contractor shall take all necessary precautions to prevent damage to existing facilities, which are to remain in place, and be responsible for any damages to existing facilities, which are caused by the operations. Damages to such work shall be repaired or replaced to its pre-existing condition at no additional cost to the Owner. The Contractor shall carefully coordinate the work of this Section with all other work and shall provide shoring, bracing, and supports, as required. The Contractor shall ensure that structural elements are not overloaded or compromised and shall be responsible for increasing structural supports or adding new supports as may be required as a result of any cutting, removal, or demolition work performed under any part of this Contract. The Contractor shall remove all temporary protection when the work is complete.

B. The Contractor shall carefully consider all bearing loads and capacities for placement of equipment and material on site. In the event of any questions as to whether an area to be loaded has adequate bearing capacity, the Contractor shall consult with the Owner prior to the placement of such equipment or material.

1.6 JOB CONDITIONS

A. The Owner assumes no responsibility for actual condition of the facilities to be removed, abandoned or modified. The Contractor shall visit the site; inspect all facilities to get familiarized with all existing conditions and utilities.

B. The Owner may occupy portions of the utilities, structures, properties or other facilities immediately adjacent to selective demolition area. Conduct selective demolition, modification and abandonment so Owner's operations
will not be disrupted. Provide not less than 24 hours notice to Owner of activities that will affect Owner's operations.

C. Owner assumes no responsibility for condition of the utilities, structures, properties or other facilities to be selectively demolished.

D. If materials suspected of containing hazardous or asbestos materials are encountered, do not disturb; immediately notify Engineer.

E. Storage or sale of removed items or materials on-site will not be permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition, modification and abandonment operations.

1.7 QUALITY ASSURANCE

A. Comply with Section 01400 - QUALITY CONTROL

B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Pre-Demolition, Modification, and Abandonment Conference: Conduct conference at Project site, which includes Owner and Engineer. Review methods and procedures related to selective demolition.

D. Review and finalize selective demolition, modification and abandonment schedule and verify availability of materials, labor, equipment, and facilities needed to make progress and avoid delays.

1.8 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Comply with material and installation requirements specified in individual Specification Sections.
2.2 MATERIALS OWNERSHIP

A. Coordinate with Engineer and Owner, who will make final determination as to whether an item is to be salvaged or removed. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site.

2.3 REPAIR MATERIALS

A. Use repair materials identical to existing materials. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible. Use repair materials whose installed performance equals or surpasses that of existing materials.

PART 3 – EXECUTION

3.1 DEFINITIONS

A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.

B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

3.2 PREPARATION FOR WORK

A. Verify that utilities have been disconnected and capped, shut-off, or bulk headed. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition, modification and abandonment required. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

B. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Engineer.
C. Engage a professional engineer to survey condition of structures to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.

D. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

E. Dangerous Materials: Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition, modification, and abandonment operations.

3.3 SITE ACCESS, TEMPORARY FACILITIES AND PROTECTION

A. Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used utilities, structures, properties or facilities.

B. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

C. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.

D. Protect existing site improvements, appurtenances, and landscaping to remain.

E. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.

F. Temporary Facilities: Provide temporary barricades and other protection required for demolition security and to prevent injury to people and damage to adjacent utilities, structures, properties and facilities to remain.

G. Provide protection to ensure safe passage of people around the area.

H. Temporary Shoring: Provide and maintain in accordance with Section 02160 - TEMPORARY EXCAVATION SUPPORT SYSTEMS.

I. Strengthen or add new supports when required during progress of selective demolition.
J. Existing landscaping materials, structures, pipes and appurtenances, which are not to be removed/abandoned shall be protected and maintained as required by the Engineer and as specified.

3.4 POLLUTION CONTROL

A. Water sprinkling, temporary enclosures, and other suitable methods shall be used to limit dust and dirt rising and scattering in the area. Comply with government regulations pertaining to environmental protection. Water shall not be used when it creates hazardous or objectionable conditions such as ice, flooding, or pollution.

B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

3.5 CLEANING

A. During and upon completion of work, the Contractor shall promptly remove unused tools and equipment, surplus materials, rubbish, debris, and dust and shall leave areas affected by work in a clean, approved condition.

B. All areas shall be cleaned of dust, dirt, and debris caused by demolition, modification, or abandonment and adjacent areas returned to conditions existing prior to start of work.

3.6 UTILITY SERVICES

A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition, modification and abandonment operations.

B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.

C. Provide at least 72 hours notice to Owner if shutdown of service is required during changeover.

D. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished or abandoned.

E. If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass area of selective demolition, relocation or abandonment, and that maintain continuity of service to other parts of building.
3.7 DEMOLITION AND ABANDONMENT PROCEDURES

A. Disposal of all materials shall be performed in compliance with applicable local, state, and federal codes and requirements. Provide labor, equipment, and materials to perform work as specified and indicated.

B. The Contractor shall flush all pipe and structures to be removed or abandoned to remove solids and objectionable material prior to commencing demolition, modification, or abandonment.

C. When existing pipe is removed, the Contractor shall plug all resulting abandoned connections whether or not shown. Where removed piping is exposed, the remaining piping shall be fitted with a removable cap or plug, or bulk headed. Where existing piping, to include catch basin laterals, is to be abandoned, the Contractor shall cut back the abandoned pipe for a distance of 5 feet from any connecting structures to remain. Pipes to be abandoned in structures to be abandoned may be capped, plugged or bulk headed from inside the structure. All holes at the existing structures shall be repaired. Abandoned pipe smaller than 15 inches diameter shall be capped or plugged at both ends, where accessible, prior to backfill. Abandoned pipe 15 inches diameter and larger shall be filled with Controlled Density Fill (CDF) prior to being capped, plugged, or bulk headed and backfilling unless otherwise noted. Each pipe reach to be abandoned with CDF shall be filled with CDF from the up gradient end of the pipe reach wherever possible. The CDF shall completely fill each pipe reach and flow out the other end. The Contractor can aid the flow of the CDF in the pipe by providing a temporary structure at the access point to build up head or by pumping the CDF or by providing vibration in the pipe reach or access point. Requirements for Controlled Density Fill are described in Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING.

D. Where existing drainage structures such as catch basins, drain manholes, sewer manholes, and combined sewer manholes are to be abandoned in place, the Contractor shall remove the frames, grates, and covers and cut the structures down a minimum of 2 feet below final grade. The Contractor shall put a minimum of four, 2-inch diameter drainage holes in the invert of each structure and then backfill the structure with control density fill or compacted sand as specified and as approved by the Engineer. Backfill around the structure shall be in accordance with Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING.

E. Permanent plugs shall be constructed of Class B concrete, brick or other material approved by the engineer.
F. Fill excavations with solid fill resulting from earth removal operations and/or with select borrow material in accordance with Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING. Final grade to be restored in kind unless otherwise noted.

G. Exercise precautions for fire prevention. Make fire extinguishers approved for Class A, B and C fires available at all times in areas where performing demolition or abandonment work with burning torches. Do not burn demolition debris on site.

3.8 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings, joints and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

2. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.

3. Maintain adequate ventilation when using cutting torches.

4. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

5. Dispose of demolished items and materials promptly.

6. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.

7. Existing Facilities: Comply with Owner’s requirements for using and protecting utilities, structures, properties and other facilities.

B. Removed and Salvaged Items: Comply with the following:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.

3. Store items in a secure area until delivery to Owner.

4. Transport items to Owner's storage area designated by Owner.

5. Protect items from damage during transport and storage.

C. Removed and Reinstalled Items: Comply with the following:

1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.

2. Pack or crate items after cleaning and repairing. Identify contents of containers.

3. Protect items from damage during transport and storage.

4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Engineer, items may be removed to a suitable, protected storage location during selective demolition, cleaned and reinstalled in their original locations after selective demolition operations are complete.

### 3.9 REHABILITATION/MODIFICATION PROCEDURES

A. Certain areas of existing piping, conduits, and the like will be affected by work necessary to complete modifications under this Contract. The Contractor shall be responsible to rehabilitate those areas affected by his construction activities.

B. When new piping is installed in existing manholes, catch basins or other structures, the Contractor shall accurately position core-drilled openings in the concrete as shown or otherwise required. Openings shall be of sufficient size to permit a final alignment of pipelines and fittings without deflection of any part and to allow adequate space for satisfactory installation of a flexible connector to ensure water tightness around openings so formed.

C. When new piping is to be connected to existing piping, the existing piping shall be cut square and ends properly prepared for the connection shown.
Any damage to the lining and coating of the existing piping shall be repaired by the Contractor.

D. At locations where existing wooden piles are to be reused to replace the existing sewer or drain, the Contractor shall verify that the wooden piles are not deteriorating. If wood piles scheduled for reuse are found to be in good condition, the piles shall be trimmed and capped with a concrete pile cap as indicated in the Contract Drawings. If wood piles scheduled to remain in place are found to be deteriorating, the Contractor shall notify the Engineer immediately.

3.10 DISPOSAL OF REMOVED/DEMOLISHED MATERIALS

A. The Contractor shall prepare and transport all demolition debris, materials, refuse, and abandoned equipment to an approved disposal site as part of the work under this section. All costs associated with the proper performance of this work shall be included in the appropriate Bid Items and at no additional cost to the Owner.

B. Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site. Demolition material shall be reused as fill to the extent possible. Removal of demolition debris, not utilized as fill, shall be conducted to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities which shall not be closed or obstructed without permission from the Owner. Alternate routes shall be provided around closed or obstructed traffic ways.

C. Burning: Do not burn demolished materials.

D. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.11 REPAIR OF DAMAGE

A. Any damage to existing facilities to remain, as caused by the Contractor's operations shall be repaired at no additional cost to the Owner. Damaged items shall be repaired or replaced with new materials as required to restore damaged items or surfaces to a condition equal to and matching that existing prior to damage or start of work of this Contract.

B. Promptly repair damage to adjacent construction caused by selective demolition operations.

C. Patching: Comply with Section 01045 - CUTTING AND PATCHING.

D. Repairs: Where repairs to existing surfaces are required, patch to produce
surfaces suitable for new materials.

E. Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

PART 4 – COMPENSATION (Not Used)

END OF SECTION 02051
SECTION 02080

SOIL AND WASTE MANAGEMENT

PART 1 – GENERAL

1.1 QUALIFICATIONS

A. The Contractor shall be experienced and knowledgeable and have the trained and qualified personnel needed to conduct the work as specified herein. Contractor shall have demonstrated experience in excavation, handling, and management of soils, including characterization for off-site disposal.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this section.

1.3 OBJECTIVE and OVERVIEW

A. This Section includes furnishing all plant, labor, equipment, appliances, and materials, and performing all operations in connection with the handling, treating, stockpiling, transporting, and disposal and/or reuse of soil and associated fill and waste material resulting from the construction operations as specified.

B. This Section also includes requirements for handling spills of contaminated and/or hazardous materials.

C. The objective of soil management practices is to handle all soil and fill excavated during this contract in accordance with applicable state, federal and local regulations and bylaws and to implement off-site soil management in a cost-effective manner.

D. This Section includes protocol for handling and management of waste materials, including, but not limited to, construction debris, municipal waste, boulders, soil, fill, ash, rubble, and empty or crushed drums and/or drum parts. The Contractor shall provide the services of an Environmental Professional qualified to coordinate all soil/fill-handling activities with the Owner or Engineer and/or their representative.

E. In the course of the work, it may be necessary to excavate and handle potentially contaminated soil/fill. The soil/fill management practices specified herein apply to all soil/fill excavated during the course of this contract.

F. To the extent possible, the Contractor shall reuse geotechnically suitable excavated material prior to using imported backfill to reduce the volume of
material to be disposed off-site. Imported backfill shall be used only as accepted by the Engineer.

G. Excavation and management of project soils and groundwater shall be conducted in accordance with:

1. In the event that conditions requiring Notification to the Massachusetts Department of Environmental Protection (MassDEP), pursuant to 310 CMR 40.0000, are encountered, a release-specific Utility-related Release Abatement Measure (URAM) Plan will be prepared by the Owner’s Licensed Site Professional (LSP) and submitted to MassDEP by the Town of Nahant DPW.

H. All work shall be conducted in compliance with the following Contractor-prepared plans. These plans may be combined as appropriate so long as all requirements of each Plan are incorporated and distinct.

1. Site-Specific Health and Safety Plan;
2. Soil Management Plan;
3. Equipment and Personnel Decontamination Plan;
4. Dust, Vapor and Odor Control Plan;
5. Air Monitoring and Quality Control Plan; and

I. For work conducted on private and public properties outside of the Rights of Way (ROW) of public roadways, additional requirements for soil testing, reuse, storage, and backfill apply, as described in this section. Excavated soil shall not be removed from the individual property until all excavation and backfill has been completed on that property. Soil shall be stored, if necessary, on the property from which it came until backfill is completed on that property. The Contractor shall reuse excavated soils as backfill within the same property from which it originated. Under no circumstances shall surplus project soil be used as backfill on a property outside of the Right of Way unless the soil originated on that property. If surplus soil cannot be used on the same property, and is consistent with soil in the adjacent Right of Way, it may be used as backfill in the Right of Way within the project limits, subject to Engineer’s Approval. If surplus soil cannot be used as backfill in the Right of Way, it shall, with the Engineer’s approval, be combined with other surplus soils; in all instances it shall be reused or disposed of in accordance with the requirements of this section.

J. For work conducted on properties outside of the public Rights of Way, the Contractor shall notify the Engineer if visual or olfactory evidence of contamination is observed in the soil on any property. The Contractor shall not collect samples for chemical testing from individual properties outside of the Right(s) of Way except as allowed by the Engineer.
1.4 DEFINITIONS

A. Area of Contamination: For the purpose of managing soil classified as RCRA characteristic or listed hazardous waste, the area of contamination is the contiguous area within which the waste has been identified.

B. Area of Excavation: For the purposes of reusing soil/fill on-site, the area of excavation is considered to be the approximate area in which the soil/fill was removed provided that area is consistent in soil strata, color, texture, geotechnical properties and has substantially similar visual and olfactory characteristics as accepted by the Engineer. Soil/fill returned to the area of excavation shall be placed approximately in the same horizontal and vertical location from which it originated.

C. Excavation: The removal of materials encountered to the elevation and width limits indicated in the Contract Drawings, Specifications, or as directed by the Engineer.

D. Fill (Historic Fill): Fill, also known as historic fill or miscellaneous fill, is defined as a mixture of soil and other materials which have been located in the area through man-made processes primarily for the purpose of grading, backfilling or filling in low areas. Materials commonly associated with historic fill includes, but are not limited to; coal, glass, brick, ash, wood fragments and other similar granular materials. Historic fill shall not include boulders, ledge, consolidated rock, asphalt pieces, concrete, railroad timbers, rail, cobblestones or other abandoned building materials that would preclude the disposal of the historic fill as daily cover at a landfill.

E. Hazardous Waste:

1. Defined in 310 CMR 40.0006; or

2. Defined in 40 CFR 261.3.

3. A waste, or combination of wastes, that, because of its quantity, concentration, or physical, chemical, or infectious characteristics may:

   a. Cause or significantly contribute to an increase in mortality or cause or significantly contribute to an increase in a serious irreversible or incapacitating reversible illness; or

   b. Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

F. Peat: A substance of vegetable origin, consisting of roots and fibers, moss, etc., in various stages of decomposition, and found as a kind of turf or bog. Peat shall be considered natural soil when it is encountered in small amounts (layers 1-foot (304.8 mm) or less in thickness) and when it is impractical to separate...
the peat from the natural soil or urban fill strata. Otherwise, peat shall be considered a distinctive stratum.

G. Soil Classification Categories: Unless specifically stated otherwise terms used in this specification are as defined in the MCP, 310 CMR 40.0006. The following definitions and soil classifications apply to these specifications:

1. (Class A) Any soil or fill material which has concentrations of chemicals < RCS-1 Reportable Concentrations established by 310 CMR 40.0300 and 40.1600.

Class A soils may be reused at the following types of facilities: Managed Fill Site (operating under an Administrative Consent Order (ACO) issued by MassDEP, unless otherwise approved by the owner); or a permitted landfill, provided that in all cases, the excavated soil analyte concentrations meet the acceptance criteria established by the facility and that disposal of soil at the receiving facility will not result in an exceedance of an RC applicable at the point of reuse/disposal and which would require notification of a release pursuant to 310 CMR 40.0300. Soils not exhibiting evidence of contamination or soils determined through laboratory chemical analysis to be Class A soils may also be reused in the area of excavation or elsewhere within Project limits as approved by the Owner’s LSP.

Soil/fill with OHM concentrations equal to or greater than (≥) RCS-1, but which have been confirmed by the Owner’s LSP to contain asphalt as a result of historic road construction or filling operations, and therefore exempt from notification requirements, may be categorized as Class A at the discretion of the Owner’s LSP.

Class A soil may be reused as common fill/ordinary borrow provided it also meets the physical requirements as specified herein and as specified in Section 02210 - Earth Excavation, Backfill, Fill and Grading. Class A soil may be used in gravel processing facilities provided the soil analytical data is comparable to materials being used by the facility and such use is approved by the Engineer.

Class A soil/fill which is reused or disposed of off-site shall be transported under a MassDEP Bureau of Waste Prevention Material Shipping Record & Log (MSR). Management of Class A soils shall be conducted in conformance with the MassDEP Similar Soils Provision Guidance – WSC#-13-500 (2014).

2. (Class B) Contaminated: Any soil or fill material which contains oil or hazardous materials (OHM) at concentrations ≥ a release notification threshold established by 310 CMR 40.0300 and 40.1600.
Soils with \( \text{OHM} \geq \text{RCS-1} \) resulting from exempt activities or meeting the definition of “background” per 310 CMR 40006, may be managed as Class A at the direction of the Owner’s LSP.

Any soils exhibiting either petroleum or chemical odor or visual indications of oil or hazardous materials as accepted by the Engineer shall be handled as potentially contaminated soils. Potentially contaminated soils may be reused within the area of excavation without first performing laboratory analyses, with the approval of the Owner’s LSP. Potentially contaminated soils shall not be mixed with soils not exhibiting either petroleum or chemical odor or visual indications of oil or hazardous materials. Any excavated soil/fill material which is not reused within the area of excavation, must be characterized prior to reuse.

Following receipt of analytical results, Class B soil/fill shall be handled in accordance with the type and concentrations of OHM present in the soil/fill. Surplus soil/fill which may be contaminated shall be segregated by the Contractor. Soil/fill which has been staged and characterized can be reused within the area of excavation or elsewhere on site provided the material has been characterized by laboratory analysis and has equal or less contamination than the point where it is to be reused.

3. Class B soil which cannot be reused on site shall be reused off-site, recycled, or disposed of at a permitted facility. Subcategories of Class B, which establish off-site management requirements, are defined as follows:

   a. **Class B-1**: Soil and Fill that meet all applicable criteria (i.e., Massachusetts Department of Environmental Protection (MassDEP) Policy # COMM 97-001 - Reuse and Disposal of Contaminated Soil at Massachusetts Landfills Policy, and/or facility-specific permit requirements) for reuse as daily cover, intermediate cover, or pre-cap contouring material at in-state unlined landfills. Note: per COMM 97-001, sediments may not be re-used as Class B-1.
   
   b. **Class B-2**: Soil and Fill that meet all applicable criteria (i.e., COMM 97-001 and/or facility-specific permit requirements) for reuse as daily cover, intermediate cover, or pre-cap contouring material at in-state lined landfills.
   
   c. **Class B-3**: Soil and Fill that meet all applicable criteria for recycling at an asphalt batching plant and/or the specific licensing requirements for the proposed recycling facility.
   
   d. **Class B-4**: Soil and Fill that contain concentrations of contaminants that exceed in-state, lined, and unlined landfill reuse criteria as well as asphalt batching acceptance criteria, but meet the criteria for regional thermal treatment facilities, and are not classified as a RCRA Hazardous Waste.
e. **Class B-5**: Soil and Fill that contain concentrations of contaminants that exceed in-state, lined and unlined landfill reuse criteria or which require removal to regional disposal facilities and which is not classified as RCRA Hazardous Waste.

f. **Class B-6**: Soil and fill which does not meet one of the designations above due to excessive foreign materials and/or debris and which is not classified as a hazardous waste.

4. **(Class C) Hazardous Waste**: A waste, or combination of wastes, that, because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause or significantly contribute to an increase in mortality or cause or significantly contribute to an increase in a serious irreversible or incapacitating reversible illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed. Also included within the definition of hazardous waste is hazardous waste as defined 310 CMR 40.0006 and 40.CFR 261.3. Hazardous waste, as defined in 40 CFR 261.3, is a solid waste that exhibits any of the characteristics of hazardous waste in excess of regulation levels presented in 40 CFR 261, subpart C and/or that is listed in 40 CFR 261, subpart D; that is a mixture of solid and hazardous waste; or that is derived from a listed waste.

Soil having or suspected of having the characteristics of a hazardous waste or of containing a listed hazardous waste shall not be removed from the lateral limits of an excavation or staged at another location except at the direction of the Engineer. Subcategories of Class C shall be as follows:

a. **Class C-1**: Soils classified as hazardous waste that can be treated on-site to eliminate the toxicity characteristic (e.g., for lead).

b. **Class C-2**: Material determined to contain "listed" or "characteristic" hazardous waste constituents which cannot be treated on-site. Land disposal of hazardous soil is prohibited until the soil has been treated to meet Land Disposal Restrictions (LDR) standards pursuant to 40 CFR 268.48. This material must be transported to an out-of-state approved RCRA permitted disposal or treatment facility under a Uniform Hazardous Waste Manifest. Land disposal following achievement of the Uniform Treatment Standards (UTS) shall be at a RCRA landfill.

H. **Special Waste**: means any solid waste that is determined not to be a hazardous waste pursuant to 310 CMR 30.000 and that exists in such quantity or in such chemical or physical state, or any combination thereof, so that particular management controls are required to prevent an adverse impact from the collection, transport, transfer, storage, processing, treatment or disposal of the solid waste. Asbestos and PCB-contaminated soils/fill (at regulated concentrations) are examples of special waste categories.
I. Soil (Natural Soils): Soil, otherwise known as natural soil, is defined as unconsolidated sand, gravel, silt and clay, and the organic material which has become part of the unconsolidated soil matrix.

J. Over Excavation: Consists of removal of materials beyond elevations and width limits indicated in the Contract Documents without direction of the Engineer. Over-excavation material handling, transportation and disposal, backfilling and compaction shall be at the Contractor's expense. Over-excavations shall be backfilled and compacted as specified for excavations of the same class, unless otherwise directed by the Engineer.

K. Unknown Materials: Any material, that is not readily identifiable as non-hazardous waste, and which has not been previously characterized or encountered during site investigation activities. The Unknown Material classification is to be used in the event that an unexpected, unusual material is encountered for which special handling procedures shall be required in order to handle the material safely. Such wastes include but are not limited to:

1. Unlabelled drums or containers containing material which is not readily identifiable as a non-hazardous substance.

2. Any material which varies significantly from material previously observed on site and which cannot be readily identified as a non-hazardous.

3. Waste material of unusual color or odor or material with indications of hazardous levels (e.g. exceeding OSHA permissible exposure limits) of contaminants as evidenced on an organic vapor monitor or other similar instrument.

The Owner reserves the right to apply generator knowledge to classify and profile the material as a previously encountered waste or as a known waste. In the event that a material is encountered which the Contractor is uncertain as to its nature, the Owner or their representative shall assess the material with the Contractor and direct the Contractor as to the nature of the material being known or unknown.

1.5 WORK INCLUDED

A. Managing excavated soil and fill material, including disposal and/or reuse of excavated soil and fill material.

B. The Contractor’s Environmental Professional shall characterize all excavated soil and fill material prior to off-site reuse or disposal; pre-excavation characterization may be conducted by the Contractor. Characterization requirements may vary depending on the site selected to receive soil suitable for reuse or the disposal facility permits and policies. The Contractor is responsible for final waste characterization.
C. At a minimum, all surplus soils shall be analyzed for the following parameters:
   1. MCP 14 total metals;
   2. Volatile organic compounds (EPA Method 8260B);
   3. Semi-volatile organic compounds (EPA Method 8270);
   4. Total petroleum hydrocarbons (EPA Method 8100M or equivalent);
   5. Polychlorinated biphenyls (PCBs) (EPA Method 8082); and

D. The Owner shall not be responsible for costs associated with additional soil characterization.

E. Characterization of soil, fill, and unknown material for disposal/reuse purposes, including: field screening and soil management/segregation; temporary storage/staging; and laboratory analysis (as may be necessary for unknown materials and/or for compliance with receiving facility requirements).

All laboratory chemical analyses conducted shall utilize currently accepted U.S. EPA and applicable state agency analytical protocols and procedures. Laboratory chemical analysis reports shall meet MassDEP Compendium of Analytical Methods (CAM) requirements for analysis which have published CAM requirements. The MassDEP MCP Analytical Method Protocol Certification Form shall be provided by the Laboratory with all sample results. TCLP analysis shall be conducted for any analyte for which the RCRA “rule of twenty” is exceeded.

F. Management of contaminated groundwater: If groundwater potentially impacted by OHM, based on visual or olfactory evidence, is encountered in the course of the work and dewatering is required, discharge permits, modification of discharge permits, and/or groundwater treatment may be necessary depending upon the discharge method(s) and/or location(s) utilized by the Contractor. The Owner and Engineer shall be notified by the Contractor if groundwater potentially impacted by OHM is identified.

G. All work at the site must be performed in accordance with all applicable federal, state, and local regulations, permits and licenses, including, but not limited to:

   1. The applicable parts of the Code of Federal Regulation (CFR) Title 40: Protection of Environment, pertaining to the Comprehensive Environmental Response and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA), RCRA, Toxic Substances Control Act (TSCA), and the National Emission Standards for Hazardous Air Pollutants (NESHAPS) as regulated by the U.S. Environmental Protection Agency (U.S. EPA);
2. State regulations specified in the Massachusetts Contingency Plan (MCP) (310 CMR 40.0000), and Massachusetts General Law 21E - Massachusetts Oil and Hazardous Materials Release Prevention and Response Act, and applicable Massachusetts Department of Environmental Protection (MassDEP) guidelines and policies;

3. MassDEP Technical Update. Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil (2002);

4. Department of Transportation (DOT) regulations 49 CFR, and state transportation licenses and permits;

5. OSHA regulations (including, but not limited to, 29 CFR 1910.1000, 29 CFR 1926, and CFR 1910.120), 40-hour Occupational Safety and Health Administration (OSHA) training (plus 8-hour refresher training) and all other applicable state and federal regulations regarding health and safety requirements;


7. Department of Transportation training;

8. U.S. Army Corps of Engineers Section 404 Programmatic General Permit, Commonwealth of Massachusetts;

9. General Contractor's license;

10. National Pollutant Discharge Elimination System (NPDES) Notice of Intent (NOI) to discharge and associated Construction General Permits, Remediation General Permits, and/or Dewatering General Permits;

11. Regional and local Publicly Owned Treatment Works (POTW) pre-treatment and construction dewatering requirements and permits;

12. Excavation and/or grading permits;

13. Special use permits;

14. Special waste haulers certificate;

15. Massachusetts Wetlands Protection Act and associated Order of Conditions;

16. The Contractor's Soil Management Plan (SMP) and Health and Safety Plan to protect the workers and the public;

17. Massachusetts Division of Occupational Safety (DOS): The Removal,
Containment or Encapsulation of Asbestos (453 CMR 6), including all clarifications, policy statements, etc.;

18. Massachusetts Department of Environmental Protection: 310 CMR 7.00, 7.09, 7.15 and all related amendments and policy statements;


21. MassDEP Similar Soils Provision Guidance (2014); and


E. Implementation of the submitted HASP and other applicable monitoring and control plans includes establishing work zones (e.g., support zone, contamination reduction zone, exclusion zone), preparing a decontamination pad(s) and staging area(s), performing the appropriate environmental monitoring, training and medical monitoring of personnel, coordinating waste disposal and waste characterization as needed.

F. The Contractor shall develop, implement, maintain, supervise, and be responsible for all soil management practices during the course of this contract. The Contractor’s Environmental Professional shall be present during all field screening, segregating, handling, and characterization of all soils excavated in the course of completing this contract to ensure that soil is managed in accordance with applicable laws, regulations, and this Section.

Soil management activities shall include and be conducted as specified herein:

1. Providing and constructing a secure soil staging area sized to adequately segregate soils in accordance with the conditions specified without impeding construction-related activities. The Contractor is to use existing information and obtain additional information as may be needed at no additional cost to the Owner to minimize the need for a staging area. If a staging area is required to characterize unknown or excess material for any reason, the Contractor is responsible for locating, selecting, preparing and securing the area. Contractor shall provide means of separating potentially contaminated material from the staging area ground surface to prevent the potential of cross-contamination. Separation method to be provided in accordance with 3.4(C).

2. Excavated soil that cannot be re-used on site shall either be loaded directly into containers for off-site reuse or disposal (provided the material has been adequately characterized and has been approved for acceptance at an off-site facility) or shall be staged at a location
determined and secured by the Contractor pending sampling and analytical characterization by the Contractor’s Environmental Professional prior to off-site reuse or disposal, with the exception of soil suspected of having the characteristics of a hazardous waste or of containing a listed hazardous waste. These soils shall not be removed from the Area of Contamination or staged at another location except at the direction of the Engineer. The Contractor is responsible for final soil characterization prior to transport and disposal. The Contractor is hereby made aware that for the purposes of disposal, final soil characterization is the responsibility of the Contractor and costs for securing a staging area and conducting waste characterization shall be incorporated into the Contractor's bid price for construction.

3. Soil that has been characterized as a Remediation Waste must be either live loaded, stockpiled on-Site or stockpiled on a property owned and/or controlled by the Owner. Stockpiling of known Remediation Waste at an alternative location shall be conducted only with the approval from the Owner and the Owner’s LSP.

4. The Contractor shall control and contain runoff of free liquids drained from stockpiled soil/fill. Free liquids shall be managed in accordance with applicable regulations.

5. Soil that has been chemically stabilized shall be confirmed through laboratory chemical analysis to be characteristically non-hazardous pursuant to RCRA prior to off-site shipment and disposal.

6. Soil/fill shall not be staged within 100 feet (30.5 meters) of a Reservoir or Area of Critical Environmental Concern.

7. Excavating unknown, previously uncharacterized material which may be classified as RCRA hazardous waste and disposing of it at an approved facility and/or on-site treatment of these materials to render it non-hazardous prior to and disposing of it at an approved facility.

8. Removing characterized on-site materials for off-site re-use or disposal.

9. Demobilizing the site, including, but not limited to, removing and disposing of construction-related equipment and materials used for personnel and equipment decontamination and related waste such as personal protective equipment (PPE), decontamination water/solids, temporary covers, and washwater storage tanks; disconnection of temporary utilities; and final clean-up to pre-construction conditions.

10. The Contractor shall manage unknown material separately and temporarily stage the material pending characterization.

G. All incidental, Contractor-generated waste (such as Personal Protective Equipment, decontamination wash water, etc.) resulting from the services
hereunder are the property and responsibility of the Contractor and are to be disposed of by the Contractor under a Uniform Hazardous Waste Manifest and/or by a Massachusetts Bureau of Waste Site Cleanup Bill of Lading, as appropriate.

H. The Contractor is responsible for identifying potential hazards at the site and reviewing existing information.

1.6 RELATED WORK

A. Section 01025 – MEASUREMENT AND PAYMENT

B. Section 01108 – HEALTH AND SAFETY PROCURES

C. Section 01500 - TEMPORARY FACILITIES AND CONTROLS

D. Section 02010 - SUBSURFACE INVESTIGATION

E. Section 02095 - TRANSPORTATION AND DISPOSAL OF SOIL AND FILL

F. Section 02140 – DEWATERING

1.7 EXISTING CONDITIONS

A. The Contractor is obligated to manage the soil and groundwater in accordance with applicable state and federal regulations.

1. Two (2) test pits were advanced in or adjacent to the project area. Refer to Drawings for test pit logs.

2. No laboratory testing of characterization of soil was completed.

1.8 SUBMITTALS

A. The Contractor shall prepare a Work Plan that generally describes the work to be performed under Section 02080 Part 3 (Execution). The work plan shall include, but not be limited to detailing the submittal and implementation of the following:

1. Site-Specific Health and Safety;

2. Soil Management;

3. Dust, Vapor, and Odor Control;

4. Air Monitoring and Quality Control; and

5. Spill and Discharge Control.
The Work Plan shall be submitted to the Owner and Engineer for review and acceptance at least two weeks prior to beginning any intrusive work at the site.

B. The Contractor shall provide the qualifications of the Environmental Professional(s) to be assigned to this project. The Environmental Professional(s) shall be at a minimum certified, registered or licensed as an Environmental Professional or equivalent and hold a Bachelor of Science Degree in Environmental Science, Environmental Engineering, or Public Health or related degree and have sufficient experience in similar work to perform the responsibilities detailed herein. The Environmental Professional(s) shall have demonstrated experience in management of RCRA hazardous waste soils and groundwater.

C. Soil Management: The Contractor shall prepare a Soil Management plan that outlines measures for soil and fill sampling, field screening, laboratory chemical analysis, treatment, and disposal/reuse. At a minimum, this plan shall address the following:

1. Methods, procedures, and equipment used for treating, excavating, dewatering, characterizing, segregating, reusing/backfilling, loading, and transportation of contaminated soil/fill materials encountered during excavation operations;

2. A list of all transporters and waste facilities, complete with license numbers, permit numbers or ACO numbers (as applicable), contact person, and address and telephone number that the Contractor utilizes for waste disposal. The Contractor shall provide copies of the permits/ACOs held by each disposal facility which the Contractor plans to use to dispose of non-hazardous solid waste; and if necessary, to dispose of hazardous waste (due to lead toxicity), PCB-impacted waste and/or asbestos-containing waste;

3. A summary of the history of compliance actions for each disposal/recycling facility proposed to be used by the Contractor. The compliance history shall include a comprehensive list of any state or federal citations, notices of non-compliance, consent decrees or violations relative to the management of waste (including remediation waste) at the facility. The Owner reserves the right to reject any facility on the basis of poor compliance history;

4. Procedures for securing the staging area, controlling dust and soil/fill migration, prevention of contamination of excavated soil by trucks used for asphalt transport, separation of stockpiled materials from the staging area ground surface, preventing damage to uncontaminated areas via contaminant migration and for decontaminating vehicles and personnel exiting the staging area;
5. The means and methods for decontaminating all equipment and personnel, including provisions for installing an equipment decontamination pad if required or specified;

6. Methods and procedures for identifying stockpiled material (e.g., labeling, marking containers) and procedures for identification and tracking;

7. Methods, procedures, and equipment used for obtaining the necessary information needed to satisfy the off-site reuse/disposal facility requirements specified herein and/or by the facility;

8. Methods, procedures, and equipment proposed for assessing and handling Unknown Materials. The SMP shall indicate which laboratory(ies) the Contractor shall utilize for chemical analysis soil, groundwater and unknown materials:
   a. An Unknown Materials information sheet shall be developed as part of the Contractor's SMP, upon which the Contractor shall record information such as container type, size, and condition; and, any identifying characteristics of the unknown material. The format of the information sheet shall be as accepted by the Owner and/or its representatives;
   b. The Contractor’s plan for notifying the Owner and Engineer in the event that an unknown material as defined in this specification is encountered. The plan shall include the phone numbers and names of the Owner’s representative(s) that the Contractor will contact in such an event.

9. Provisions for separation of incompatible materials;

10. Protocol for over-packing drums (if encountered);

11. Procedures for consolidating (i.e., bulking) compatible materials for disposal; and

12. Procedures for dewatering; testing, handling, treatment, and disposal/discharge of groundwater.

D. Soil Management/Tracking Documentation:

Prior to off-site disposal or reuse, the Contractor shall provide to the Engineer a letter from the disposal facility indicating that the facility has reviewed the available data relative to the soil/fill to be delivered and agrees that the soil/fill meets their acceptance criteria. The letter shall be signed by a duly authorized representative of the receiving facility.
Within the time constraints established in state and/or Federal laws and regulations, the Contractor shall submit to appropriate authority(ies), as applicable, Uniform Hazardous Waste Manifests and/or Bills of Lading for all soils and associated fill disposed or reused of off-site utilizing such documents. Copies of all manifests, Bills of Lading, and all other documents used to track and/or permit off-site transportation of soils shall be submitted to the Engineer within ten (10) days of shipment. The Contractor is responsible for preparation of all manifests, Bills of Lading, Material Shipping Records, and all other related documents completely, legibly, and accurately prior to submitting them to the Owner and/or its representative for generator and LSP signatures. (Bills of Lading shall be prepared electronically by the Owner’s LSP; the Contractor shall be responsible for providing information necessary for completion of the BOL). The Contractor shall be responsible for paying for any and all fines associated with inaccurate, incorrect, or improperly completed manifests, Bills of Lading and all other related documents, including fines resulting from late or untimely submittals.

E. Spill and Discharge Control (SDC): The SDC program shall provide contingency measures and reporting responsibilities for potential uncontrolled spills and discharges of contaminated and/or hazardous materials, including, but not limited to, leachate, decontamination water, sewage, and other on-site waste materials. In addition to the above listed items, the SDC program shall specifically contain: procedures for containing dry and liquid spills; absorbent material available on site; storage of spilled materials; governmental reporting (i.e., notification) procedures; decontamination procedures; discharges of sanitary or combined sewers into storm drains either by flow handling/bypassing or accidental or unintentional discharge; and procedures for protecting wetlands and surrounding public and private property.

The Spill and Discharge Plan shall indicate the location and quantity of the materials to be staged on site and the basis for the quantities (i.e. indicate the vessel which will be on site containing the greatest volume of oil or hazardous materials). No fuel or oil tanks or drums may be temporarily staged on site unless they are stored within a secondary containment system. Fuel deliveries shall be performed in a designated area which has either secondary spill containment or an impervious surface with absorbent berms located around the point of fuel delivery. The Spill and Discharge Plan shall indicate the location of the fueling area and the nature of secondary containment which the Contractor intends on utilizing.

1. Notification Procedures: The Contractor shall prepare in advance of work activities a notification list, complete with phone numbers, addresses, and contact names for all parties to be notified in the event of a spill. This list shall include:

   a. Owner’s designated representatives;
   b. Owner;
   c. Fire Department;
   d. Engineer; and
The Owner shall be notified immediately of an uncontrolled spill or discharge. If human health or the environment are potentially threatened, the Contractor shall take immediate action to abate the conditions and notify emergency personnel.

2. Spill Incident Report(s): In the event of an uncontrolled spill or discharge, a written report detailing each uncontrolled spill or discharge shall include, at a minimum, the cause and resolution of incident, outside agencies involved, and date of occurrence. The report shall be submitted to the Owner within 48 hours of the incident. The Contractor shall document all spills on the as-built Drawings and submit the Drawings to the Owner at project completion. The Contractor shall be responsible for remediating any spills or releases of oil or hazardous materials as a result of the Contractor’s activities. The site shall be remediated to pre-release conditions at no additional cost to the Owner.

F. Dust, Vapor and Odor Control (DVOC): The DVOC program shall include measures to control objectionable dust, vapors, and chemical or natural odors originating from the work area or soil/fill staging area. The DVOC Plan shall describe procedures to minimize the creation of dust, and the control of objectionable vapors and odors originating from the site. At a minimum, the DVOC program shall include air monitoring as specified in paragraph 3.6. The Contractor shall have materials on hand to implement control measures.

PART 2 – PRODUCTS

2.1 DUST AND VAPOR CONTROL

A. Air monitoring shall include total dust testing using MIE, Inc. Miniram PDM-3 Dust Monitors, or like instruments. Air monitoring shall include monitoring for total volatile organic vapors using a MiniRAE Photoionization Detector of like instrument.

2.2 SPILL CONTROL

A. At a minimum, the Contractor shall maintain on-site absorbent pads, booms and absorbent materials in sufficient quantity to address a release of fuel oil, hydraulic oil or other OHM that the Contractor intends to use or store on site, including fuel oil and hydraulic oil that is used within earth moving equipment. The quantity of spill containment materials maintained on site shall be sufficient to respond to a catastrophic release from the vessel containing the greatest quantity of oil or hazardous material on-site.
2.3 EQUIPMENT DECONTAMINATION PAD

A. The Contractor shall provide all materials and labor to complete an equipment decontamination pad. Liner materials and collection system shall be selected by the Contractor to perform as specified.

PART 3 – EXECUTION

3.1 GENERAL

A. All work in this section will be performed in accordance with the Contractor's Work Plan, SMP and Site-Specific HASP.

B. The primary concern of the Contractor in the excavating, handling, sampling, bulking, and on-site storage of soil/fill and/or drummed material (if encountered) will be to protect the health and safety of the site workers, the public, and the environment.

C. The Contractor shall keep a copy of the Health and Safety Plan (HASP) on site during all operations and shall conduct daily health and safety meetings. Failure to keep a copy of the HASP on-site, or any other breach of the Contractor's Plan, may be cause for stopping work at the cost of the Contractor. Delays caused by the Contractor's failure to comply with the health and safety regulations or any health and safety plan shall not entitle the Contractor to recover any additional costs or time lost. The Contractor shall not be allowed to resume activities until corrective measures are accepted by the Engineer and/or their representative and implemented.

D. Medical surveillance records, OSHA 40-hour training forms, accident forms, and all other documentation requirements of the Contractor's safety and health program for personnel working on the site (who are subject to exposure to potentially contaminated soil) shall be up-to-date and kept on file at the site. The Contractor shall provide documentation of employee status upon request of the Engineer and/or their representative.

3.2 SOIL/FILL MANAGEMENT

A. Soil and fill material that is managed under a Utility-related Abatement Measure (URAM) Plan pursuant to the MCP, which is staged off-site, and which is not characteristically hazardous, may be re-used within fourteen (14) calendar days of excavation. Any material which is suitable for re-use as ordinary borrow, based on geotechnical results and could have been placed on site, but was not, due to Contractor delay (i.e. laboratory results were not available within ten (10) days following excavation) will be disposed in
accordance with the applicable regulations by the Contractor at no cost to the Owner.

B. Soil and fill material that is managed under a Utility-related Abatement Measure (URAM) Plan pursuant to the MCP, which is determined at the staging area to be characteristically hazardous for lead may be treated (stabilized) within the “Area of Contamination” only and must be reused or disposed of within ninety (90) calendar days of excavation. No treatment may occur at the staging area if outside the “Area of Contamination”. If soils have been staged off-site prior to sampling and are subsequently determined to be characteristically hazardous for lead, no stabilization treatment may occur; these soils shall be managed as hazardous waste.

C. Class B and C excavated soils shall be completely covered with a minimum 10-mil thick layer of plastic tarp and/or sheeting. Soils exhibiting evidence of potential contamination including but not limited to odors and/or staining shall be covered prior to characterization and off-site reuse or disposal. Stockpiled soils determined to be Class B or C, as described herein, shall be securely covered at the close of each day and continuously when not being added to or otherwise being handled by the Contractor. Stockpiles, including those of Class A soils, shall also be covered at times as directed by the Engineer.

D. Excavated soil shall not be removed from a private property until all excavation and backfilling has been completed on that property. Soil shall be stored, if necessary, on the property from which it was excavated until backfill is completed on that property. The Contractor shall reuse excavated soils as backfill within the same property from which it originated. Under no circumstances shall surplus project soil be used as backfill on a property outside of the Right of Way unless the soil originated on that property. If surplus soil is generated that cannot be used on the same property, and is consistent with soil in the adjacent Right of Way, it may be used as backfill in the Right of Way within the project limits, subject to the Engineer’s approval. If surplus soil cannot be used as backfill in the Right of Way, it shall, with the Engineer’s approval, be combined with other surplus soils and reused or disposed of in accordance with the requirements of this section. The Contractor shall not collect samples for chemical testing from individual public or private properties outside of the Right of Way except as allowed by the Engineer.

E. Excavated soil shall be managed such that it is not exposed to contamination following excavation. Equipment and supplies in contact with excavated soil shall be free of asphalt, petroleum products or other hazardous materials that could be transferred to soil. Vehicles used to transport asphalt shall not be used
to transport soil except by permission of and following inspection by of the truck, by the Engineer.

3.3 SOIL/FILL CHARACTERIZATION

A. Soil and fill material shall be classified based on the criteria established in the accepted SMP and these Specifications.

B. Oil and Hazardous Materials Findings and Soil Management Recommendations, Washington Street, Somerville, Massachusetts, dated March 18, 2019, performed by the Engineer during design, is appended to this section and includes a summary of analytical results.

C. The Contractor may either perform independent sampling and pre-characterization of soil/fill strata to be encountered during construction in advance of excavation such that excavated soil can be directly transported to an appropriate facility; or the Contractor shall make the necessary arrangements to secure a staging area(s) suitable for storing soil stockpiles pending analyses.

D. Soil shall be preliminarily segregated based on the Soil Classification Categories detailed in Sub-section 1.4, except as indicated below.

1. Potential Asbestos Containing Material (PACM): If soil/fill suspected of including asbestos-containing debris is encountered during excavation, the Contractor or the Contractor-hired Environmental Professional shall immediately contact the Engineer to discuss the nature and extent of the PACM and to assess potential hazards and appropriate handling procedures. Prior to handling and removing the PACM, MassDEP shall be notified and approval for handling and disposal obtained. Discovery and management of PACM shall be documented as required in the SMP. Evidence of PACM includes but is not limited to the presence of suspect asbestos-containing building debris such as broken or crushed asbestos-cement (transite) piping, vinyl floor tiling, tar-based pipe wrap, roofing paper or paper-like insulation materials. Following MassDEP approval, such soil/fill shall be managed in accordance with applicable regulations. Soils shall be analyzed for OHM to determine appropriate disposal requirements, as required by the proposed disposal facility.

2. Unknown Material. If unknown material is encountered during excavation, the Contractor or the Contractor-hired Environmental Professional shall immediately contact the Engineer to discuss the nature and extent of the unknown material and to assess potential hazards and appropriate handling procedures. Prior to handling and removing the unknown material from the excavation area, the Contractor and Owner and/or its representatives, shall visually assess the material and its potential hazards. Drums shall be assessed to determine whether they are leaking, bulging (evidence of reactive
waste), crushed, or empty. Crushed, empty, and/or skeletal parts of drums shall be handled as solid waste, as specified. The Contractor shall record any identification or markings on the drummed material(s). Discovery and management of unknown materials shall be documented as required in the SMP.

E. Disposal Characterization: Waste characterization shall be the responsibility of the Contractor. The Contractor shall be responsible for determining the characterization requirements of each disposal facility in advance to facilitate timely disposal and to adequately estimate the disposal costs. The Contractor shall perform additional segregation based on disposal requirements. Disposal or reuse of the material shall depend on sampling and characterization analytical results.

Stockpiles within the staging area shall be sampled and characterized within a timely manner so as not to impede construction activities or preclude the reuse of soil/fill on site. If soil/fill cannot be reused on site due to the Contractor’s delay in sampling material, the Contractor shall dispose of the soil/fill at no additional cost to the Owner including the cost of imported fill material used in its place.

3.4 STAGING AREAS

A. Unless the staging area is comprised of an impervious surface material such as asphalt or concrete, the Contractor shall pre-characterize the surface soils (0-6”) at the staging area(s) prior to staging any soils to document the existing conditions relative to contamination which may result from using the area to stage excess or unknown materials. A minimum of one composite surface soil sample, consisting of at least five grab samples, for every 2,500 square feet of staging area shall be collected by the Contractor prior to staging materials at the location. The samples will be submitted to a certified laboratory for analysis for:

1. MCP 14 total metals;
2. Volatile organic compounds (EPA Method 8260B);
3. Semi-volatile organic compounds (EPA Method 8270);
4. Total petroleum hydrocarbons (EPA Method 8100M or equivalent); and
5. Polychlorinated biphenyls (PCBs) (EPA Method 8082).

B. At the completion of the work, the Contractor shall replicate the pre-staging sampling and analysis protocol to assess impacts to the area from use as a staging area.

C. Stockpiles located within the soil staging areas shall be placed on asphalt or concrete, or on a 20-mil HDPE liner and bermed to minimize the effects of contamination release. Each soil category shall be staged in separate areas with berms constructed a minimum of 2 feet above the existing grade with hay bales,
concrete barriers, or functionally equivalent berm material. All wastes must be disposed off-site within ninety (90) days of excavation.

D. As described above and herein, excavated materials shall be completely covered with a minimum 10-mil thickness polyethylene tarp and/or sheeting and secured with tires, ropes, anchors or equivalent material. The covered system shall be capable of resisting actual wind gusts at the site, with a minimum wind capacity of 40 miles per hour. The stockpile covers shall be installed and secured at the end of each working day and at all times when earthwork is not taking place on site. Stockpile covers shall be immediately recovered should wind forces expose any of the excavated materials. Stockpiles shall also be covered at times as directed by the Engineer.

E. Stockpiles are to be segregated based on a review of pre-characterization data and visual and olfactory conditions and field screening results obtained during excavation. Similar material may be stockpiled together. Each stockpile must be clearly separated from adjacent stockpiles.

F. Stockpiles shall be clearly designated by a sign post or marker which can be cross-referenced with samples collected from the pile for characterization purposes. The signs/markers are not to be moved, except by authorized personnel and not until the soil is ready to be either reused on site or loaded for off-site disposal.

G. Stockpiles shall be limited in size to approximately 500 cubic yards, unless approved by the Engineer. If, as a result of combining soil piles into larger volumes than 500 cubic yards, soil must be disposed of as a higher cost bid item than would otherwise be required, the Contractor shall be responsible for the additional cost.

H. Excavated soil shall not be added to a stockpile after it has been sampled for characterization.

I. Unknown, potentially hazardous soils/debris and drummed materials encountered during the project shall be located in a separate bermed location. The Contractor's Soil Management Plan shall provide construction details of the dimensions and protective measures proposed for the staging area(s). The construction details and protective measures are subject to the acceptance of the Owner and/or its representatives. The Contractor shall select the area to facilitate handling of the material and to minimize interference with other ongoing construction activities. The Owner or Engineer must agree with the location prior to construction.

3.5 EQUIPMENT AND PERSONNEL DECONTAMINATION

A. Equipment and personnel decontamination area(s), conforming with the Contractor's HASP and these Specifications, shall be constructed in such a manner to protect existing site surfaces, materials, and structures from contamination. Equipment decontamination areas shall be sized adequately to
provide for the decontamination of the largest piece of equipment to be decontaminated. Filter fabric shall be placed over an impermeable liner to protect the liner from rips, punctures, or tears from traffic and heavy equipment.

B. The Contractor shall establish a site-specific decontamination protocol and decontamination areas for personnel and equipment utilized at the subject site. Personnel and equipment decontamination shall be conducted in compliance with the HASP.

C. The decontamination protocol shall include (i) the means, methods, and materials for the proposed decontamination procedures; (ii) the procedures employed to contain and store the wash or rinse liquids/sludges; (iii) procedures used to sample, analyze, and characterize the contaminated wash or rinse liquids/sludges; (iv) procedures to contain or clean contaminated equipment and PPE; and (v) the procedures for handling and disposing of solid wastes generated from site decontamination activities. All sample analysis or sample compositing shall be completed by a certified laboratory. The Contractor shall be responsible for the cost of this analytical work. The Contractor shall submit a copy of the analytical results and laboratory certifications to the Owner for review prior to proceeding with disposal. The Contractor shall be responsible to properly manifest and dispose of all residual wastes generated from on-site activities in conformance with federal, state, and local environmental and transportation regulations. The Contractor shall be responsible for the manifests and procedures to be used to package and dispose of contaminated solid wastes, wash, or rinse liquids at an EPA or state-approved treatment or disposal facility. The Contractor shall be responsible for any releases from site or decontamination activities due to its work, and will remediate any release for which the Contractor is responsible to pre-existing conditions at the Contractor’s expense.

D. Provisions for collecting decontamination water will be incorporated into the maintenance of the decontamination pad and will include placing an impermeable liner over a sloped surface such that water is directed, if necessary, into an area for subsequent pumping to 55-gallon drums or other appropriate tankage. Following completion of the work, the wash water shall be characterized by the Contractor and disposed off-site, in accordance with federal, state, and local regulations.

3.6 ENVIRONMENTAL FIELD MONITORING/DUST CONTROL

A. The Contractor’s Site Health and Safety Officer shall keep accurate documentation of all air monitoring in accordance with the Contractor’s Health and Safety Plan. Air monitoring data shall be made available to the Engineer or Owner upon request. At the direction of the Engineer, air monitoring may be limited to visual assessment for dust and odor monitoring; instrument monitoring may be required at any time by the Engineer, based on the results of visual and odor monitoring.
B. During excavation and construction at depths of greater than 2 feet below ground surface, the Contractor shall monitor the air quality at and surrounding the areas where construction activities involve soil handling such as excavation, re-location, staging, loading or grading of soil/waste materials. Air monitoring shall involve appropriate techniques capable of providing real-time indications of air contaminants to protect on-site personnel and the local population. If there are indications of contamination, the frequency of air monitoring shall be determined by the Contractor’s Industrial Hygienist or competent environmental health professional. The Contractor’s Site Health and Safety Officer and Superintendent shall be responsible for assuring that monitoring is conducted in an appropriate manner by personnel trained to operate the air monitoring equipment, record measurements, and compare to actions limits established by the Contractor’s Health and Safety Plan, and that work practices, engineering controls and/or Personal Protective Equipment are proper for the conditions.

C. The air monitoring program is to be designed to protect public health and the environment from the potential generation of vapors, dust and odors and contaminant release during work. At a minimum, the air monitoring shall include daily monitoring and documentation of one upwind, and two downwind conditions during periods of activity on the site and when there is a potential for dust being generated on the site. The air monitoring information including air monitoring in the vicinity of all site activities shall also be utilized for establishing levels of personal protection measures in the Contractor's Site Specific Health and Safety Plan. The Contractor shall submit his/her air quality monitoring program for review prior to commencement of site activities.

D. Air monitoring shall be performed by the Contractor during all soil handling operations. In contaminated areas, detectors for organic contaminants and dust should be utilized to monitor on-site and off-site breathing zones and possible sources of potentially hazardous material (e.g. excavations, regrading, etc.). All personnel shall be made aware of the potential hazards and be informed of air monitoring information by the Contractor. Particular attention to air quality shall be made in the work area during earthwork activities to ensure that contaminants do not escape to the atmosphere and affect off-site population, on-site control, working conditions and personnel protection measures.

E. Total VOC concentrations shall be monitored by the Contractor during excavation. Use of odor and vapor suppressing foam shall be evaluated by the Contractor and used as required to maintain worker and public health and control off-site migration of odors. Foam shall be free of perfluoroalkyl substances.

F. Ambient dust levels at the site shall be monitored by the Contractor prior to construction. During construction, real-time dust monitoring shall be conducted during any soil/fill handling activities. The monitoring shall consist of total dust testing using MIE, Inc. Miniram PDM-3 Dust Monitors, or like instruments. Dust shall be controlled during excavation of soil/fill material to limit potential spread of contaminants and potential exposure of contaminants.
to workers and the public. The total dust criteria at the site shall conform to the requirements of the HASP. Should fugitive dust quantities exceed 20 percent of the ambient level, the Contractor shall perform additional dust concentrations.

G. Nuisance dust levels shall be reduced by pre-wetting the surface soils and by establishing and maintaining clean access roads. The Contractor's Dust, Vapor, and Odor Control Plan shall describe the procedures and materials to minimize dust. At a minimum, the Contractor shall provide clean water, free from salt, oil, and other deleterious materials.

Areas of exposed earth to be excavated shall be lightly sprayed with water before excavation if there is potential for nuisance dust generation. Additional water spray may be utilized only when any indication of excessive dust is observed. To the extent feasible, the Contractor shall minimize the use of water within the limits of excavation.

H. All containers temporarily storing waste material shall be covered at all times except as necessary to place waste material into the container. The Contractor shall monitor the covers daily to ensure the covers are in place and effectively eliminating the generation of dust and make appropriate notes in the site log.

I. In the event that asbestos containing materials are encountered, dust control measures, which may include negative air containment, shall be instituted in accordance with all applicable local, state and federal laws and regulations.

3.7 VAPOR AND ODOR CONTROL

A. The Contractor shall provide the materials and labor to control objectionable vapors and odor in accordance with the Contractor’s Vapor and Odor Control Plan. The Contractor shall limit the exposure area and shall cover the exposure area with synthetic reusable covers, lime, foam suppressants (containing no per- and polyfluoroalkyl substances (PFAS)), or other methods to reduce off-site odors to acceptable levels. The Contractor shall not use soil suitable for on-site reuse as cover to control vapor and odors.

3.8 BULKING

A. Following characterization and compatibility testing of waste material, the Contractor shall place compatible materials into common containers to reduce transport and disposal costs. In addition, materials that are improperly contained shall be transferred into the appropriate containers. Drums and containers used during this project shall meet the appropriate DOT, OSHA, and U.S. EPA regulations for the materials contained. The Contractor shall describe the bulking procedures in the Soil and Fill Management Plan.
3.9 BACKFILLING AND COMPACTION

A. Excavated areas shall be backfilled with appropriate backfill material (including excavated material suitable for reuse and, when necessary, imported off-site material). Imported backfill used in excavated areas shall have been analyzed and certified as free of contaminants and as specified in Section 02210 – EARTH EXCAVATION, BACKFILL, FILL, AND GRADING.

PART 4 – COMPENSATION (Not Used)

END OF SECTION 02080
SECTION 02095

TRANSPORTATION AND DISPOSAL OF SOIL AND FILL

PART 1 – GENERAL

1.1 DESCRIPTION

A. Furnish all labor, materials, equipment, and incidentals required to transport waste material off site, and dispose, reuse or recycle excess soil or waste materials at a licensed facility approved by the Owner.

B. All personnel involved in the transportation of waste from the site shall have the required Department of Transportation (DOT) and Occupational Safety and Health Administration (OSHA) training.

1.2 RELATED WORK

A. Section 01108 – HEALTH AND SAFETY PROCEDURES

B. Section 01500 – TEMPORARY FACILITIES AND CONTROLS

C. Section 02010 – SUBSURFACE INVESTIGATION

D. Section 02051 – DEMOLITION, MODIFICATION, AND ABANDONMENT

E. Section 02080 – SOIL AND WASTE MANAGEMENT

F. Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01300 – SUBMITTALS:

1. A list of all transporters, destination/receiving sites and waste facilities, complete with license numbers and permit numbers (as appropriate), contact person, and address and telephone number that the Contractor utilizes for soil management and waste disposal.

2. Where appropriate the Contractor shall submit waste manifests for all waste disposed off-site to the appropriate authority, agency, facility, or person within the time constraints specified by state and federal regulations. Copies of all waste manifests and Bill of Lading documentation including weight slips and BOL summary sheets shall be provided to the Owner within ten (10) days. It is the responsibility
of the Contractor to complete all waste manifests and bills of lading completely and accurately prior to submitting them to the Owner. For MassDEP Bills of Lading the Contractor shall provide the Owner’s Licensed Site Professional (LSP) all information required for preparation of electronic Bills of Lading. The Contractor shall be responsible for preparation of Material Shipping Records. The Contractor shall be responsible for submitting to the Owner’s LSP all information necessary for preparation of LSP opinion letters to disposal facilities and coordinating disposal documentation with all parties. The Owner’s LSP and the Owner shall sign any MassDEP Bill of Lading forms where required only after the Contractor has provided the information required for preparation of electronic MassDEP forms. The Contractor shall reimburse the Owner for any and all fines associated with inaccurate, incorrect, or improperly completed waste manifests, including fines resulting from late or untimely submittals.

3. Disclose a summary of the history of compliance for each disposal/recycling facility proposed to be used by the Contractor. The compliance history shall include a comprehensive list of any state or federal citations, notices of non-compliance, consent decrees or violations relative to the management of waste (including remediation waste) at the facility. The Owner reserves the right to reject any facility on the basis of poor compliance history.

4. Prior to transporting any soils or fill material to a disposal facility the Contractor shall submit a letter from the disposal facility indicating that the facility has reviewed the available data and the generator’s profile of the material and the facility agrees that it meets the facility’s acceptance criteria.

5. Within fifteen (15) business days following off-site disposal of soil or fill materials at a disposal facility the Contractor shall submit Material Shipping Record or MCP Bill of Lading load log sheets signed by the facility.

6. Following disposal of all the soil represented by a Material Shipping Record or Bill of Lading, the Contractor shall submit that Material Shipping Record “Acknowledgment of Receipt by Receiving Facility” or Contractor shall arrange for receiving facility to electronically sign that Bill of Lading “Attestation of Disposal”, as applicable, within sixty (60) days of shipment.
PART 2 – PRODUCTS

2.1 GENERAL

A. Provide completed Bills of Lading, Material Shipping Records, manifests, certificates of disposal, weight slips and all other documentation relative to disposal, reuse or recycling of soil and waste material.

PART 3 – EXECUTION

3.1 GENERAL

A. The Contractor shall reuse, recycle or dispose of all excess soil and wastes resulting from excavation activities in accordance with federal, state and local regulations and these specifications. Transport shall be by a permitted and licensed waste transporter. The Contractor shall be responsible for supplying the proper manifests to be approved and signed by a representative of the Owner.

B. Prior to disposal, it shall be the responsibility of the Contractor to maintain segregated waste stockpiles in conformance with all applicable federal, state, and local waste disposal regulations and as specified in Section 02080 - SOIL AND WASTE MANAGEMENT.

C. The Contractor shall be responsible for preparing and keeping in proper order all waste manifests, Bills of Lading and Material Shipping Records, and shall designate one person who shall be made available to sign all transportation documentation. The Engineer shall be responsible for obtaining the Owner’s signature and all other signatures required for the proper completion of the manifests. The Contractor shall allow a minimum of five working days from the date of the submittal for any documents requiring the signature of the Owner and/or the LSP. The manifests shall document the handling of the waste from the time it is generated until the time it is properly disposed.

D. The Contractor shall be responsible for obtaining all federal, state, and local permits and variances to allow transport of materials on public roadways.

E. The Contractor shall be responsible to inform the Owner if hazardous waste disposal will not be performed within 90 days of hazardous waste characterization. This notification shall take place a minimum of 30 days prior to the 90-day deadline. No hazardous waste stockpiled at the site shall remain on site more than 60 days after it is characterized.

F. The Contractor shall obtain certificates of disposal for all disposed waste.

G. Transportation of solid wastes shall be in compliance with any relevant federal, state and local special waste requirements, and such as to assure that waste material is not released during transit.
3.2 SOLID WASTES

A. Transporters of solid wastes that include, but are not limited to, contaminated soil/fill (including oil-contaminated soil/fill), construction and demolition debris, non-hazardous laboratory wastes, bottles, tires, metal parts, tree stumps, brush, and grass cuttings will utilize trucks or dumpsters specifically designed to ensure that material, dust, or liquid is not released in transit. No truck shall be allowed to exit the site until all free liquids are drained from soil/fill or other solid waste being transported off-site. Material shall be covered at all times. The vehicle in which the waste is transported shall be driven directly to the intended destination without any stops or detours in between, except those necessary in response to road conditions, vehicle service needs, or emergencies. Discharge or release of material during transport shall be immediately reported to the Owner. Transporters shall clean up any discharge that occurs in transit, at the Contractor’s expense.

B. The disposal site shall be permitted by the state in which the facility is located to receive and dispose of solid waste, and shall be approved for use by the Owner. The Contractor shall provide copies of the disposal facility’s operating permit.

C. Manifesting of solid waste shall be required and shall include vehicle identification; date of loading and disposal; tonnage, as measured at the disposal site; and signature of the Owner and/or its representative, transporter, and disposal facility’s representative. Transportation of the wastes shall be accompanied by the appropriate manifests, as required in the Code of Massachusetts Regulations (CMR) 310 CMR 40.0030, such as a Material Shipping Record, MassDEP Bill of Lading, or by a Uniform Hazardous Waste Manifest. Where paper documents are utilized, the original shall be returned to the Owner, and/or their representative, within ten (10) working days of disposal.

D. All solid waste shall be disposed in accordance with all applicable federal, state and local laws and regulations, as well as all other state laws through which the waste material is being transported.

E. Transport of soils in which asbestos containing materials have come to be located shall be transported and disposed of in accordance with Section 02080 – SOIL AND WASTE MANAGEMENT and all applicable local, state and federal laws and regulations.

3.3 HAZARDOUS WASTES

A. Transporters of hazardous wastes shall be in conformance with Code of Federal Regulations (CFR) 40 CFR, Part 171, all other federal laws and regulations, 310 CMR 30.400, and all other state laws through whose boundaries the waste material is being transported. The transporter shall provide copies of its EPA
identification number, Massachusetts transporter's license, and proof of driver training in transporting hazardous waste.

B. The disposal site shall be in conformance with 40 CFR, Part 264 and relevant laws of the state in which the facility is located. The Contractor shall provide copies of the disposal facility’s EPA and state treatment and disposal permit.

C. Manifesting of hazardous wastes shall be in conformance with 40 CFR, Part 264, Subpart E and 310 CMR 30.405.

3.4 DUST CONTROL

A. Dust control measures shall be implemented during loading and transport of waste material from the site in accordance with the contractor's Dust Control Plan, as specified in Section 02080 – SOIL AND WASTE MANAGEMENT.

PART 4 – COMPENSATION (Not Used)

END OF SECTION 02095
SECTION 02100
SITE PREPARATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

1.2 SUMMARY

A. This section includes the following:

1. Provide labor, material, tools and equipment to prepare site as indicated and specified.

2. Protection of existing trees and vegetation outside the limit of work and specifically designated trees and vegetation within the limit of work.

B. Related sections include the following:

1. Section 02210: Earth Excavation, Backfill, Fill and Grading.

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 EXISTING TREES AND VEGETATION

A. Protect existing trees from damage.

B. Accept responsibility for damages outside these lines.

3.2 EXISTING STRUCTURES AND PROPERTY

A. Remove and reset at completion of project existing signs, posts, catchbasin frames and grates, manhole frames and covers, and granite curbing within construction path unless directed otherwise.

B. Store at a site designated by Owner, items in reusable condition as determined by Engineer.
3.3 STOCKPILES

A. Stockpiles shall be neatly trimmed and graded to provide drainage from surfaces and to prevent depressions where water may become impounded. All construction operations shall be performed to prevent mixing of objectionable materials with the topsoil, and stockpiles shall be protected and shall not be disturbed except for subsequent operations for replacing topsoil. The location of stockpiles shall be approved by the Owner and the Engineer.

3.5 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01701.

END OF SECTION 02100
SECTION 02140

DEWATERING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this section.

B. Related Sections:

1. Section 01300: SUBMITTALS
2. Section 02010: SUBSURFACE INVESTIGATION
3. Section 02210: EARTH EXCAVATION, BACKFILL, FILL, AND GRADING
4. Section 02160: TEMPORARY EXCAVATION SUPPORT SYSTEMS.

1.2 SUMMARY

A. This section includes the following:

1. Design, furnish, operate, maintain, and remove temporary dewatering systems to control groundwater and surface water to maintain stable, undisturbed subgrades, and allow work to be performed under dry and stable conditions and comply with permit and other regulatory requirements. Work to be done as part of dewatering includes, but is not limited to:

a. Obtain necessary state, local and Federal discharge permits.

b. Lower the groundwater level within excavations to at least 2 feet below the bottom of the excavation.

c. Lower hydrostatic pressure.

d. Prevent surface and storm water from entering the excavation during construction.

e. Limit settlement of utilities and adjacent structures.

f. Implement erosion and sedimentation control measures for disposing of discharge water.

g. Provide treatment system to treat all water removed from
excavations as required by discharge permits, except water that is reinfiltred to the ground on site in a manner that does not result in negative on- or off-site impacts.

h. Provide observation well and geotechnical implementation as specified and indicated or as otherwise required by the Engineer.

i. Provide an Environmental Site Professional/Dewatering Specialist/Field Representative (hereinafter referred to as the Dewatering Professional) who will be responsible for dewatering, reinfiltation, treatment and discharge of dewatering flows as specified and in compliance with all applicable permits and regulations.

j. Common dewatering methods include, but are not limited to, sump pumping, deep wells, well points, vacuum well points or any combinations thereof.

2. Water removed from excavations shall be reinfiltred to the ground if feasible. If reinfiltation is not feasible, treated water shall be discharged to the local sewer system in accordance with the appropriate permit and regulations. In no case shall dewatering flows be directly or indirectly released to surface waters or storm drains prior to settling of suspended solids and appropriate additional treatment.

1.3 SUBMITTALS

A. Shop Drawing: Submit the following in accordance with Section 01330 – SUBMITTALS:

1. Qualification of both the Contractor’s dewatering specialist or firm's qualifications (installation) and the Dewatering Professional (all other responsibilities) a minimum of four (4) weeks prior to execution of any dewatering. The submittal shall include, but not be limited to:

   a. Qualifications of specialist or firm's Registered Professional Engineer as specified below.

   b. Qualifications of the Dewatering Professional who shall oversee the installation, operation and maintenance of the dewatering system.

2. Submit a dewatering plan including design calculations at least four (4) weeks prior to start of any dewatering operation. The review will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing
facilities and proper utilization of the site. The Contractor shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include the following items as a minimum:

a. Dewatering plan and details stamped and signed by a Massachusetts Registered Professional Engineer that conform to the requirements of the dewatering permit(s), and all other applicable regulations and permits including, but not limited to, requirements for equipment, monitoring, sampling and reporting.

b. A list of equipment including, but not limited to, pumps, prime movers, and standby equipment.

c. A description of the proposed method of dewatering; water reinfiltration; containment; treatment and discharge; and installation, monitoring, maintenance, and system removal procedures.

d. A groundwater monitoring plan shall be developed by the Professional Engineer retained by the Contractor that designs the dewatering system. The monitoring plan shall address groundwater control within the excavations and address settlements of utilities and adjacent structures.

e. A description of erosion/sedimentation control measures, and methods of disposal of pumped water.

f. List of all applicable laws, regulations, rules, and codes to which dewatering design conforms.

3. Data for the required discharge reports shall be collected by the Contractor’s Dewatering Professional. It shall consist of periodic sampling and analysis of system influents, midfluents and/or effluents and discharge quantities and other requirements of the relevant permits. The Contractor’s Dewatering Professional shall also coordinate analysis of samples at an appropriately certified analytical laboratory and shall comply with all permit reporting requirements.

4. A modified dewatering plan within 24 hours, if open pumping from sumps and ditches results in boils, loss of fines or softening of the ground.

1.4 QUALITY ASSURANCE

A. Provide in accordance with Section 01400 – QUALITY CONTROL and as
specified.

B. If an on-site treatment system is required, employ the services of a Dewatering Professional and a Massachusetts Registered Professional Engineer having the following qualifications:

1. The Massachusetts Registered Professional Civil Engineer shall have completed the design of at least five (5) successful dewatering projects of equal size and complexity and with equal systems within the last five (5) years consisting of deep wells, well points, vacuum well points, and sump pumping for heavy Civil projects of similar size, type, and complexity in urban areas with the appropriate temporary support of excavation systems proposed by the Contractor including, but not limited to, trench boxes, soldier pile and lagging, timber sheeting support and secant pile support of excavation systems.

2. The dewatering systems installer supervisor shall have a minimum of 5 years experience in installation of well points, deep wells, recharge systems, or equal systems.

3. The Dewatering Professional responsible for day to day operation of the system shall have the following minimum qualifications:

   a. Completion of at least 5 successful dewatering projects of equal size and complexity with equal systems within the last five (5) years consisting of system operation and troubleshooting, collection of readings, maintenance of logs and other required documents, collection of samples, coordination of analysis of samples, and compliance with reporting requirements during pumping for heavy Civil projects of similar size, type, and complexity in urban areas.

   b. Valid certification from the Massachusetts Department of Environmental Protection (DEP) to operate the proposed treatment system.

C. If subgrade soils are disturbed or become unstable due to dewatering operation or an inadequate dewatering system, notify the Engineer, stabilize the subgrade, and modify system to perform as specified at no additional cost to the Owner.

D. Notify the Engineer immediately if any settlement or movement is detected on any adjacent structures. If the settlement or movement is deemed by the Engineer to be related to the dewatering, take actions to protect the adjacent structures and submit a modified dewatering plan to the Engineer within 24 hours. Implement the modified plan and repair any damage incurred to the adjacent structures at no additional cost to the Owner.

E. If oil and/or other hazardous materials are encountered after dewatering begins,
immediately notify the Engineer.

1.5 PROJECT/SITE CONDITIONS

A. Subsurface Conditions: Refer to Section 02010.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Provide groundwater monitoring wells in accordance with the submitted dewatering plan or as specified.

B. Provide casings, well screens, piping, fittings, pumps, power and other items required for dewatering system.

C. Provide sand and gravel filter around the well screen. Wrapping geotextile fabric directly around the well screen shall not be allowed.

D. When deep wells, well points, or vacuum well points are used, provide pumping units capable of maintaining high vacuum and handling large volumes of air and water at the same time.

E. Provide and store auxiliary dewatering equipment, consisting of pumps and hoses on the site in the event of breakdown, at least one (1) pump for every five (5) used.

F. Provide dewatering equipment, including an appropriately sized settling tank, and maintain erosion/sedimentation control devices as indicated or specified and in accordance with the dewatering plan.

G. Provide temporary pipes, hoses, flumes, or channels for the transport of discharge water to the discharge location.

H. Provide cement grout having a water cement ratio of 1 to 1 by volume above the well screen and below the installed road box where applicable.

PART 3 – EXECUTION

3.1 GENERAL

A. Execution of any earth excavation, installing earth retention systems, and dewatering shall not commence until the related submittals have been reviewed by the Engineer with all Engineer’s comments satisfactorily addressed, the geotechnical instrumentation has been installed and baselines established and submitted to the Engineer, and the Dewatering Professional is on site and has begun the duties specified herein.
B. Furnish, install, operate, and maintain dewatering, re-infiltration, treatment and discharge systems as indicated or specified and in accordance with the dewatering plan. As no dewatering flows shall be discharged to surface waters either directly or indirectly without appropriate settling, at a minimum, the Contractor shall provide a settling tank minimum, such that if pumping rates exceed discharge rates, sufficient storage capacity is available. Delays due to insufficient storage capacity will be at no additional cost to the Owner. The Contractor is responsible to evaluate available data and determine the necessary storage capacity so as to not impede construction activities.

C. Unless otherwise specified, continue dewatering uninterrupted until all structures, pipes, and appurtenances below groundwater level have been completed such that they will not be floated or otherwise damaged by an increase in groundwater elevation.

D. Discontinue open pumping from sumps and ditches, if such pumping is resulting in boils, loss of fines, softening of the ground, or instability of the slopes. Modify dewatering plan and submit to the Engineer at no additional cost to the Owner.

E. Where subgrade materials are disturbed or become unstable due to dewatering operations, remove and replace the materials in accordance with Section 02210 – EARTH EXCAVATION, BACKFILL, FILL, AND GRADING at no additional cost to the Owner.

3.2 DEWATERING DISCHARGE

A. Water to be reinfilt rated need not be treated, provided that it is reinfilt rated to the ground on site in a manner that does not result in negative on- or off-site impacts. Contractor shall provide infiltration that complies with relevant local, state and federal regulations.

B. Transport pumped or drained water to discharge location in compliance with applicable permits and without interference to other work; damage to or contamination of pavement, other surfaces, or property; erosion; or siltation.

C. Provide separately controlled pumping lines.

D. Immediately notify the Engineer if groundwater is encountered that is suspected to be contaminated with substances other than those for which the treatment system has been designed. Do not pump water found to be contaminated with oil or other hazardous material to the discharge locations without prior treatment and permits.

3.3 COMPLIANCE WITH DEWATERING AND RELATED PERMITS AND REGULATIONS

A. Discharging groundwater and allowing for natural infiltration may not be a
viable option for controlling groundwater in the project area. Should dewatering activities be required where the Contractor needs to discharge groundwater to a location other than the point of origin, then the Contractor shall be prepared to store, treat and discharge the water in accordance with applicable permits and regulations. Periodic sampling, as may be required to demonstrate treatment effectiveness and compliance with discharge and/or pretreatment standards specified in any local, state, or federal discharge permit required shall be the responsibility of the Contractor and its Dewatering Professional. Water that cannot be infiltrated is anticipated to be discharged to the sewer system. The Contractor shall be responsible for seeking coverage under the appropriate construction site dewatering discharge permit. At a minimum, the Contractor shall be prepared to comply with the permit influent/effluent testing requirements. The Dewatering Plan shall include a description of procedures and information related to the collection of readings, maintenance of logs and other required documents.

B. The Contractor, through its Dewatering Professional:

1. Shall furnish all labor, equipment and materials necessary to obtain accurate representative samples of the groundwater and for analysis for the set of analytical parameters specified above and as required by local, state and federal permits and regulations.

2. Shall coordinate sampling activities with the Engineer. The engineer reserves the right to sample treated and untreated dewatering flows at any time.

3. Shall take readings from the treatment system in accordance with the dewatering plan.

4. Shall collect an initial sample of untreated and treated groundwater at the beginning of dewatering activities within the construction area.

5. Shall prepare and keep in proper order all records required by regulatory authorities and permits.

6. Shall maintain logs and other records in accordance with the Specifications, regulatory agency and permit requirements, and the Dewatering Plan.

7. Shall coordinate analysis of samples by an appropriately certified analytical laboratory in accordance with the Specifications, regulatory agency and permit requirements, and the Dewatering Plan, and ensure that laboratory detection limits meet permit requirements.

8. Shall comply with reporting requirements in a timely manner and in the format required by the relevant permit. Reporting in compliance with permit requirements includes, but is not limited to, notification to the appropriate regulators and the Owner and Engineer prior to discharge;
submittal of laboratory analytical reports for each sampling event; submittal of reports for each reporting period during which no discharge occurs; notification of non-compliant discharges; notification of termination of discharge; and response to permit-related questions posed by regulators or the Owner and Engineer.

a. Water will be discharged under a MWRA construction site dewatering discharge permit as applicable. The Contractor shall submit notifications and reports to the entities identified in the permit. Comply with pre-discharge notification, discharge reporting, notification of no discharge, and termination of discharge notification requirements; and respond to inquiries or correspondence from agencies regarding permit issues.

b. If water will be discharged under a local permit, submit notifications and reports as required in the permit.

c. For monthly or less frequent reporting deadlines, provide the Engineer with copies of all reports fourteen (14) days prior to the reporting deadline, and submit reports to the appropriate agency(ies) at the same. Provide copies of other dewatering documents to the Engineer immediately.

9. Install and maintain erosion/sedimentation control devices at the point of discharge as indicated or specified and in accordance with the dewatering plan.

10. The Contractor shall obtain all federal, state, county, and local permits and variances to allow transport of materials on public roadways, should such transport be necessary.

11. The Contractor shall dispose of all wastes resulting from construction dewatering activities in accordance with local, federal and state regulations.

12. The Contractor is solely responsible for the implementation of the permit requirements, and is solely responsible for any punitive action resulting from any violation of the permit. The actual permit issued to MWRA shall become part of this Contract by either addendum or by change order. If the actual permit is included by change order, no additional costs for implementing the permit will be considered by the Owner, when the actual permit is issued.

3.4 REMOVAL

A. Do not remove dewatering system without written approval from the Engineer.

B. Backfill and compact sumps or ditches with crushed stone wrapped with
geotextile fabric in accordance with Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING.

C. All dewatering wells shall be abandoned upon completion of the work, and completely backfilled with cement grout.

PART 4 – COMPENSATION (NOT USED)

END OF SECTION 02140
PART 1 – GENERAL

1.1 SUMMARY

A. This section includes the following:

1. Design, furnish and install temporary excavation support systems as required to maintain lateral support, prevent loss of ground, limit soil movements to the allowable limits indicated, and protect from damage existing and proposed improvements including, but not limited to, pipelines, utilities, structures, roadways, and other facilities.

2. The location, configuration, design, construction and maintenance of the excavation support walls and internal bracing shall be the sole responsibility of the Contractor.

3. The temporary excavation support system to be used on this project may include singular or multiple stages comprised trench boxes.

4. Construction of the temporary excavation support system shall not disturb the existing structures or the completed proposed structures. The Contractor, at no additional cost to the Owner, shall repair damage to such structures.

5. The Contractor shall bear the entire cost and responsibility of correcting any failure, damages, subsidence, upheaval or cave-ins as a result of improper installation, maintenance or design of the temporary excavation support systems. The Contractor shall pay for all claims, costs and damages that arise as a result of the work performed at no additional cost to the Owner.

6. Monitoring movement of the lateral support systems by optical survey techniques is required by an independent geotechnical monitoring consultant until installation and backfilling is complete. Additional survey monitoring of the lateral support system may be required if movement (lateral or vertical) is measured following backfilling to the existing grade.

7. If, in the Engineers judgment, the performance of the excavation
support system is unacceptable, the Owner may instruct the Contractor to stop work and implement remedial measures to arrest further movements or restore groundwater levels to pre-construction levels. The Contractor shall take immediate steps to implement the remedial measures designed by the Contractor and reviewed by the Engineer. The costs for these measures shall be at no additional cost to the Owner.

8. Temporary excavation support systems shall be designed and installed in accordance with OSHA excavation safety standards.

1.2 SUBMITTALS

A. Shop Drawings: Submit the following in accordance with Section 01300 – SUBMITTALS.

1. Submit the following qualifications three weeks prior to the construction:
   a. Qualifications of Contractor’s temporary excavation support system designer as specified below.
   b. Qualifications of Contractor’s temporary excavation support system installer as specified below.

2. Submit a temporary excavation support plan stamped and signed by a Professional Civil Engineer registered in the Commonwealth of Massachusetts at least two weeks prior to start of the construction. Submit design calculations for review that will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The Contractor shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include the following items as a minimum:
   a. Excavation support system, details, location, layout, depths, extent of different types of support relative to existing features and the permanent structures to be constructed, and methods and sequence of installation and removal.
   b. Requirements of dewatering during the construction.
   c. Minimum lateral distance from the edge of the excavation support system for use for vehicles, construction equipment, and stockpiled construction and excavated materials.
d. List of equipment used for installing the excavation support systems.

3. For excavation support systems left in place, submit the following as-built information prior to backfilling and covering the excavation support systems:
   
   a. Survey locations of the temporary excavation support systems, including coordinates of the ends and points of change in direction.
   
   b. Type of the temporary excavation support system.
   
   c. Elevations of top and bottom of the excavation support systems left in place.

5. Calculations and design drawings showing estimates of the lateral and vertical displacements of the excavation lateral support systems under applied loads at critical stages.

1.3 QUALITY ASSURANCE

A. Provide in accordance with Section 01400 – QUALITY CONTROL and as specified.

B. Conform to the requirements of the OSHA Standards and Interpretations: "Part 1926 Subpart P - Excavation, Trenching, and Shoring", and all other applicable laws, regulations, rules, and codes.

C. All welding shall be performed in accordance with AWS D1.1.

D. Prepare design, including calculations and drawings, under the direction of a Professional Civil Engineer registered in the Commonwealth of Massachusetts and having the following qualifications:

   1. Not less than five (5) years experience in the design of temporary excavation support systems of comparable type, size, and complexity as this project.

   2. Completed not less than five (5) successful temporary excavation support system projects of comparable type, size, and complexity as this project within the last five (5) years.

D. Temporary Excavation Support System Installer's Qualifications:

   1. Not less than five (5) years experience in the installation temporary excavation support systems of comparable type, size, and complexity as this project.
2. Completed not less than five (5) successful temporary excavation support system projects of comparable type, size, and complexity as this project within the last five (5) years.

F. Install all temporary excavation support system under the supervision of a supervisor having the following qualifications:

1. Not less than five (5) years experience in installation of temporary excavation support systems of comparable type, size, and complexity as this project.

2. Completed at least five (5) successful temporary excavation support system projects of comparable type, size, and complexity as this project.

1.4 DESIGN CRITERIA

A. Design of temporary excavation support systems shall meet the following minimum requirements:

1. Support systems shall be designed for earth pressures, hydrostatic pressure, equipment, traffic, temporary stockpiles, construction loads, and other surcharge loads in accordance with the current AASHTO (American Association of State Highway and Transportation Officials) Design Criteria.

2. Design internal bracing as needed to provide sufficient reaction to maintain stability.

3. Design the embedment depth below bottom of excavation to minimize lateral and vertical earth movements and provide bottom stability. Toe of unbraced temporary excavation support systems shall not be less than 5 feet below the bottom of the excavation.

4. Design temporary excavation support system shall withstand an additional 3 feet of excavation below proposed bottom of excavation without redesign except for the addition of lagging and/or bracing.

5. Maximum width of pipe trench excavation shall be as indicated on the Drawings.

E. Allowable Movement Criteria

1. Lateral deflection at the top of the excavation support system shall not exceed 1.0 inch.

2. Limit movement of buildings and buried utilities adjacent to the excavation support system to be within 0.5 inches.
1.5 DELIVERY, STORAGE AND HANDLING

A. Provide in accordance with Section 01610 – Delivery Storage and Handling and as specified.

B. Store sheeting and bracing materials to prevent sagging, which would produce permanent deformation. Keep concentrated loads, which occur, during stacking or lifting below the level, which would produce permanent deformation of the material.

1.6 PROJECT/SITE CONDITIONS

A. Subsurface Conditions: Refer to Section 02010.

B. The Contractor shall notify the Engineer immediately if obstructions are determined to conflict with the location of the excavation support system. Cobbles and boulders within dense well-bonded soils or other competent naturally deposited soils will not be considered obstructions.

C. The Contractor shall protect adjacent structures above ground and buried from damage associated with lateral support of excavation operations and other operations. Damage due to lateral excavation support operations or other Contractor activities shall be repaired immediately by the Contractor at his own expense.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Structural Steel

1. All soldier piles, Wales, rakers, struts, wedges, plates, waterstop and accessory steel shapes shall conform to ASTM A36.

B. Timber Lagging Left-in-Place

1. Structural grade having a nominal thickness of 3 inches and a minimum allowable working stress of 1100 psi.

C. Timber Sheeting Left-in-Place

1. Structural grade having a nominal thickness of 4 inches and a minimum allowable working stress of 1100 psi.

D. Other Materials
1. Tamping tools adapted for backfilling voids after removal of the excavation support system.

2. Hydraulic, pneumatic or screw-jack shoring systems (Speed Shores) used to support excavations shall be in good working order and shall conform to all of the manufacturer’s requirements for new equipment; bent or otherwise damaged supports, leaking hydraulic cylinders, or damaged sheeting shall not be used, and the Contractor shall immediately remove such damaged materials/equipment from the work site.

PART 3 – EXECUTION

3.1 GENERAL

A. Installation of the temporary excavation support system shall not commence until the Engineer has reviewed the related earth excavation and dewatering submittals with all Engineers’ comments satisfactorily addressed.

B. Install excavation support system in accordance with the Contractor’s temporary excavation support plan.

C. Carry out program of temporary excavation support in such a manner as to prevent undermining or disturbing foundations of existing structures, and of work ongoing or previously completed.

D. Perform preparatory work to discover, protect, maintain and restore, or remove utilities, foundations or other facilities located in close proximity of the proposed excavation lateral support system.

E. Conduct pre-excavation as necessary to remove obstructions and identify exiting utilities along the alignment of the excavation lateral support system which will interfere with installation in accordance with Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING.

F. The Contractor shall provide fully equipped rig(s) and appropriate tools in full-time operation at the site during the work, and shall mobilize additional equipment, if necessary, to complete the work on schedule.

G. Excavation shall not proceed more than 2 ft below the bracing level, anywhere within the excavation support limits, until the entire level of bracing is completely installed, including prestressing.

H. Notify utility owners if existing utilities interfere with the temporary excavation support system. Modify the existing utility with the utility owner’s permission or have the utility owner make the modifications at no additional cost to Owner.
I. All trench support shall be installed and maintained so it is in continuous contact with the earthen trench walls being supported.

3.2 SOLDIER PILES AND TIMBER LAGGING

A. Install steel soldier piles before starting excavation. Install soldier piles by drilling or hydraulically pushing to the design tip elevation. Driving by impact or vibratory hammers shall not be allowed. Drilled methods shall prevent loss of ground around the hole. Each soldier pile shall be installed in its drilled hole within 2 hours after drilling is completed to the required depth.

B. The Contractor shall have equipment on-site able to advance the drilled hole, for installation of the soldier piles, through sand below the water table, through concrete, and through large boulders and other obstructions which may be encountered.

C. Space soldier piles at intervals indicated on the with the Contractor’s temporary excavation support plan. Accurately align exposed faces of flanges to vary not more than 2 inches from a horizontal line and not more than 1:120 out of vertical alignment.

D. Within the same day of seating the soldier piles in the drilled holes, encase the piles with MHD (1998) M4.08.0 – Controlled Density Fill, Type 1E from the tip elevations to the currently existing ground surface. Crushed stone or other granular materials are not acceptable.

E. Install wood lagging within flanges of soldier piles as excavation proceeds. Trim excavation as required to install lagging. As installation progresses, backpack the voids between the excavation face with sand and on-site soils to establish a tight contact. Pack louver openings between lagging with hay or other porous material to allow free drainage of groundwater without loss of retained soil or backpacking. In no case shall the louvered openings be allowed to exceed 1-inch.

F. Beginning at the top of the soldier piles, the maximum permissible height of unlagged face of excavation shall not exceed 2-feet in all soil types encountered at the site. If water is flowing from the face of the excavation, or if soil to be retained moves toward the excavation, the maximum height of unlagged face shall not exceed 8-inches.

G. If unstable ground is encountered, take suitable measures (grouting behind the lagging or other approved method) to retain the material in place and prevent loss of ground or movements, which may cause damage to adjacent structures or utilities.

H. Prior to completion of the final backfilling operations, soldier piles shall be cut off five feet below the final ground surface.
3.3 INSTALLATION – STEEL OR TIMBER SHEETING

A. Length Markings: Before installation is started each steel or timber section shall be marked so that the depth of the tip can be readily determined. This shall be accomplished by a method that is approved by the Engineer.

B. Sheeting shall be installed by means of hydraulically pushing each sheet piling to the required design depth. No impact or vibratory hammers will be allowed for installation of steel or timber sheeting on this project. The Contractor shall take all precautions against excessive vibrations in all areas. The Contractor shall be solely responsible for any damages caused directly or indirectly to structures, sewer and other utilities, and shall repair any such damage occurring due to his operations to the requirements of the Owner.

C. All sheeting shall be protected from damage during installation.

D. All sheeting shall be hydraulically pushed to its full depth ahead of the excavation so as to avoid the loss of material from behind the sheeting; where voids occur outside of the sheeting, they shall be filled immediately with structural fill and thoroughly compacted.

E. The Contractor shall provide all inspection equipment to determine whether the sheeting has been started in their planned location, are vertical, and are within the allowable tolerance for position after installation.

F. Requirements for the sheeting include the following:

1. Install sheeting in the plumb position.

2. Install sheeting such that the piling is in direct contact with the material to be retained.

3. Install sheeting to the depths indicated on Contractor’s approved temporary excavation support plans.

4. Methods and equipment used in pushing, setting, cutting and splicing shall conform to approved Shop Drawings.

5. Use templates or other temporary alignment facilities to maintain piles plumb and on line.

6. Control vibrations and noise associated with installation.

7. Pre-excavate as necessary to remove existing structures along alignment of the sheeting.

8. Sheeting shall be positioned within 3 inches of the design plan location along its length from top down to bottom of excavation grade. Design plan locations are to be established by the Contractor’s
3.4 INTERNAL LATERAL WALL BRACING (WALES AND STRUTS)

A. Use walers and struts as necessary to provide support of the excavation lateral support walls as required. Include web stiffeners, plates, brackets, or angles as required to prevent rotation, crippling or buckling of connections and points of bearing between structural steel members. All for eccentricities due to fabrication and assembly. Consider effects of temperature changes.

B. Install and maintain all support members in continuous tight contact with each other and with the earth wall being supported.

C. Coordinate locations of all bracing and components thereof for temporary lateral excavation support with locations of permanent structures.

D. Control rate of excavation and installation of support members to minimize movement of adjacent ground surface.

E. Excavation shall proceed in accordance with the detailed sequence submitted by the Contractor and reviewed by the Engineer. It shall be the responsibility of the Contractor to schedule and sequence the work accordingly.

3.6 MONITORING

A. As proposed by the Contractor and approved by the Engineer.

B. In the event the monitoring system proposed by the Contractor proves ineffective, the Contractor shall implement additional measures as required by the Engineer at no additional cost to the Owner.

3.7 REMOVAL OF EXCAVATION SUPPORT SYSTEM

A. Where removal of sheeting cannot be removed without damage to nearby utilities or work recently installed or other facilities it shall be left in place with the exception of the top 4 ft. of excavation support wall below final grades, which shall be removed, unless otherwise approved by the Engineer.

B. Remove excavation support in a manner that will maintain support as excavation is backfilled and will not leave voids in the backfill.

C. Do not begin the removal of the excavation support system until it can be safely removed damage to existing facilities, completed work or adjacent property.

D. Fill any void left by the shoring system or voids created by the removal of the shoring system to provide soil support between the trench backfill and the
native soil.

E. Sheet piling removal must be performed in a manner that will avoid “vibro-consolidation” (densification) of sandy or granular material below or adjacent to the excavation that could lead to settlement and damage of the pipeline, the gas transmission main, other works of construction and adjacent property.

PART 4 – COMPENSATION (Not Used)

END OF SECTION 02160
SECTION 02210

EARTH EXCAVATION, BACKFILL, FILL AND GRADING

PART 1 – GENERAL

1.1 SUMMARY

A. This section includes the following:

1. The Work shall consist of excavation of all materials removed within the limits of the Contract in accordance with the Specifications and in close conformity with the lines, grades, thickness and cross sections shown on the plans or established by the Engineer.

2. The Contractor shall comply with all applicable laws, rules, ordinances, and general regulations of the Federal Government, the Commonwealth of Massachusetts, the Town of Nahant, the DEP, EPA, OSHA, and other regulatory agencies having jurisdiction over the Work.

3. Provide materials for backfilling excavations as indicated and specified.

4. Grade surfaces to meet finished grades indicated. Grade roadway and site as to maintain them in a level unrutted condition and to eliminate puddling of surface and subsurface water.

5. Excavate test pits as necessary or as directed by the Engineer.

6. Remove and dispose of rock, as defined in Section 01025, Measurement and Payment, and furnish acceptable material for backfill in place of excavated rock as indicated.

7. Contractor is not permitted to use blasting, unless otherwise approved in writing by the Engineer, and only after a blasting plan has been submitted to the Engineer and approved by the Engineer.

8. The Contractor shall be aware of all utilities and existing structures within a 2 horizontal to 1 vertical (2H:1V) upward envelope from the bottom of any proposed excavation. Any utilities and structures within this zone shall be monitored for movement.

a. The Contractor shall bear the entire cost and responsibility of correcting any failure, damages, subsidence, upheaval or cave-ins as a result of improper excavation, maintenance or backfill of excavation. The Contractor shall pay for all claims, costs and damages that arise as a result of the work performed at no additional cost to the Owner.
1.2 SUBMITTALS

A. Shop Drawings: Submit the following in accordance with Section 01300 – SUBMITTALS:

1. Submit an Excavation, Backfilling, Grading and Compaction plan at least two weeks prior to start of any earth moving activities. The review will be only for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The Contractor shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include, but not be limited to the following items:

   i. Detailed sequence of work.

   ii. Location of proposed test pits.

   iii. General description of construction methods.

   iv. Numbers, types, and sizes of equipment proposed to perform excavation, backfilling, grading and compaction.

   v. Details of dust control measures.

   vi. Proposed locations of stockpiled excavation and/or backfill materials.

   vii. Proposed surplus excavated material off-site disposal areas and required permits.

   viii. Erosion and sedimentation control measures, which will prevent erosion and sedimentation during the earth moving and soil stockpile activities.

B. Backfill Materials: Submit a grain size analysis and moisture density curve performed in accordance with ASTM D422 and ASTM D1557, respectively, for each proposed source of backfill, imported material and on-site material to be reused, for review by the Engineer, at least, one week prior to use of the material. The grain size analysis shall indicate that the backfill material conforms to the gradation requirements specified.

1. In addition, a certification statement and analytical results shall accompany each physical sample of earth materials to be imported onto the site, including but not limited to crushed stone, loam, bedding sand, gravel sub-base, common fill and structural backfill. At a minimum the certification shall state the point of origin and that the material is free of contaminants. The certification shall include representative sample analysis from each point of origin of backfill to be used on the site. The sample(s) shall be analyzed by a certified
laboratory for RCRA 8 metals, volatile organic compounds (EPA Method 8260), semi-volatile organic compounds (EPA Method 8270), petroleum hydrocarbons (EPA Method 8100), and Total PCBs and pesticides (EPA Method 8081 and 8082). On-site soils defined as suitable for reuse in this Section and in Section 02080 – SOIL AND WASTE MANAGEMENT can be used as backfill without providing the certification required above.

2. All sampling of soils for chemical testing shall be performed by a person experienced in sample collection and shall be either: 1) a Licensed Site Professional registered in the Commonwealth of Massachusetts; 2) a Professional Engineer registered in the Commonwealth of Massachusetts; 3) a professional Geologist registered in the Commonwealth of Massachusetts; 4) a certified groundwater/environmental professional; or 5) an authorized representative of the one of the persons listed above. Samples of each material shall be submitted to a chemical analytical laboratory, certified by the Massachusetts Department of Environmental Protection.

3. Submit additional samples and geotechnical and analytical test data and certifications for every 1000 cubic yards (every 200 cubic yards for moisture density curves) of material imported or reused on-site or anytime consistency of material changes in the opinion of the Engineer. Submit associated chemical laboratory data on the imported materials throughout the course of the Work, if requested by the Engineer, to evaluate the consistency of the source or process, at no additional cost to the Owner.

4. Controlled Density Fill Mix Design: Prior to beginning the work the Contractor shall submit for review, controlled density fill mix designs which shall show the proportions and gradations of all materials proposed for each class and type of controlled density fill specified herein.

5. Filter Fabric: Submit shop drawings and product data sheets.

C. During Construction, submit written confirmation of fill lift thickness, in-place soil moisture content, and percentage of compaction to the Engineer before placing the next lift or constructing foundations.

D. Submit Qualifications of the Contractor’s Independent Testing Laboratory as specified herein, three weeks prior to the execution of any earth excavation, backfilling, filling, or compaction process.

E. Test Pit Logs

1. Prepare and submit a log of the existing conditions observed. Each test pit log shall be submitted as its own document. The following
information shall be indicated on the log as appropriate:

i. Plan sketch indicating size, material, quantity, function, ownership and direction of flow for each structure and utility. Include a north arrow.

ii. Swing ties indicating the horizontal location of each structure, utility and duct bank. Where horizontal alignment is found to vary, swing ties shall be recorded at appropriate intervals.

iii. Top and bottom elevations of each structure and utility, and the dimensions of any encasement. Where vertical elevations are found to vary, elevations shall be recorded at appropriate intervals.

iv. Where test pits are conducted to establish a vertical corridor for a proposed pipeline through conflicting utilities, include a profile sketch indicating the vertical separation between utilities.

2. Submit photographs that document wide-angle and close-up views of the existing conditions observed.

1.3 DEFINITIONS

A. Suitable Material: Material which does not contain organic silt or organic clay; peat; vegetation; wood or roots; stones or rock fragments over 6-inch in diameter; porous biodegradable matter; loose or soft fill; excavated pavement; or refuse. Stones or rock fragments shall not exceed 40 percent by weight of the backfill material. Clay or silt content shall not exceed 25 percent by weight of the backfill material.

B. Unsuitable Materials: Material which contains organic silt or organic clay; peat; vegetation; wood or roots; stones or rock fragments over 6-inch in diameter; porous biodegradable matter; loose or soft fill; excavated pavement; or refuse. Materials that do not comply with the requirements for the acceptable material or which cannot be compacted to the specified or indicated density.

C. Percentage of compaction is defined as the ratio of the field dry density, as determined by ASTM D6938 to the maximum dry density determined by ASTM D1557, multiplied by 100.

D. Proof Roll: Compaction with a minimum of four passes of a vibratory steel drum roller. Vibratory plate compactors shall be used in small areas where a vibratory steel drum roller cannot be used.

E. Rock Excavation:

1. Rock excavation in trenches and pits includes removal and disposal
of materials and obstructions encountered which cannot be excavated with a 1.0 cubic yard (heaped) capacity, 42-inch wide bucket on track-mounted power excavator equivalent to Caterpillar Model 215, rated at not less than 90HP flywheel power and 30,000 lb. drawbar pull. Trenches in excess of 10 foot 0-inches in width and pits in excess of 30 feet 0-inches in either length or width are classified as open excavation.

2. Rock excavation in open excavations includes removal and disposal of materials and obstructions encountered which cannot be dislodged and excavated with modern track-mounted heavy-duty excavating equipment without drilling, blasting or ripping. Rock excavation equipment is defined as Caterpillar Model No. 973 or No. 977K, or equivalent track-mounted loader, rated at not less than 170HP flywheel power and developing 40,000 lb. break-out force (measured in accordance with SAE J732C).

3. Determination of rock excavation classification shall be made by the Engineer. Typical of materials classified as rock are boulders 1.0 cu. yd. or more in volume, solid rock, rock in ledges, and rock-hard cementitious aggregate deposits. Intermittent drilling or ripping performed to increase production and not necessary to permit excavation of material encountered will be classified as earth excavation. Do not perform rock excavation work until material to be excavated has been cross-sectioned and classified by Engineer. Visual observation of the completed excavation may be made by the Engineer to modify the excavation classifications. Removal of rock excavation prior to classification by the Engineer shall be considered as earth excavation unless accepted by the Engineer in writing. Such excavation will be paid on the basis of contract unit rates for this classification.

4. If rock is excavated beyond the limits of payment indicated on the drawings, specified, or authorized in writing by the Engineer, backfill excess excavation, whether resulting from over breakage or other causes, at no additional compensation and as specified in Part 3 - Execution.

1.4 REGULATIONS

A. The Contractor shall be solely responsible for making all excavations in a safe manner. All excavation, trenching, and related sheeting, bracing, etc. shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926 Subpart P) and State requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.
B. Comply with all applicable laws, rules, ordinances, and general regulations of the Federal Government, the Commonwealth of Massachusetts, the Town of Nahant, the Nahant Department of Public Works, DEP, EPA, OSHA, and other regulatory agencies having jurisdiction over the Work.

1.5 QUALITY ASSURANCE

A. Dewatering and Groundwater Control: Provide and maintain as specified in Section 02140 - DEWATERING.

B. Excavations shall be performed in the dry, and kept free from standing water, snow and ice during construction.

C. Temporary Excavation Support Systems: Provide and maintain as specified in Section 02160 – TEMPORARY EXCAVATION SUPPORT SYSTEMS

D. Do not excavate or fill until the Engineer has reviewed all the required submittals.

E. Formulate excavation, backfilling, and filling schedule and procedures to eliminate possibility of undermining or disturbing foundations of partial and completed structures (if present), pipelines and embankments or existing structures and pipelines.

F. Cut pavement and all surface materials to the top of the existing fill material with a saw to prevent damage to remaining pavement without extra compensation. Surface materials may include concrete slabs, cobblestones, rails and other miscellaneous materials. Where pavement is removed in large pieces, dispose of pieces before proceeding with excavation.

G. If material for pipe support is found to be unsuitable, as defined in these Specifications, at or below the grade to which excavation would normally be carried in accordance with the drawings and/or specifications, remove such material to the required width and depth as required by the Engineer and replace it with structural fill.

H. During progress of work, conduct earth-moving operations and maintain work site so as to minimize the creation and dispersion of dust.

I. Bedding and backfill material shall not be placed in water. Water shall not be allowed to rise upon or flow over the bedding and backfill material.

J. Employ an independent testing laboratory to perform particle size and gradation analyses, in accordance with ASTM D422, as well as compaction testing. The independent testing laboratory shall have the following qualifications:

1. Be accredited by the American Associates of State Highway and Transportation Officials (AASHTO) Accreditation Program;
2. Have three years experience in sampling, testing and analysis of soil and aggregates, and monitoring field compaction operations;

3. Able to provide three references from previous work.

1.6 PROJECT/SITE CONDITIONS

A. Subsurface Conditions: Refer to Section 02010.

1.7 MATERIAL TESTING

A. Moisture Density - One per source, except for crushed stone. Repeat the moisture density test for every 200 cubic yard of material used, and whenever visual inspection indicates a change in material gradation as required shall be as determined by the Engineer.

B. Gradation Analysis - A minimum of one per source, for each moisture density test, and whenever visual inspection indicates a change in material gradation. For on-site fill soil, the Engineer shall determine frequency of tests required.

C. Construction Tolerances: Construct finished surfaces to plus or minus 0.5 inches of the elevations indicated. Provide the Engineer with adequate survey information to verify compliance with above tolerances.

1.8 FIELD TESTING

A. Field Testing and Inspections: By Contractor’s independent testing laboratory, acceptable to the Engineer, at Contractor’s expense as specified. Location of tests shall be mutually acceptable to testing laboratory and the Engineer or as required by the Engineer. In the event compacted material does not meet specified in-place density, recompact material and retest this area until specified results are obtained at no additional cost to the Owner.

B. Methods of Field Testing: In-Place Density: ASTM D6938; In-Place Moisture Content: ASTM D6938 or ASTM D4959; Material Testing Frequency: The following testing frequencies are minimum required for all structural and non-structural fill materials.

C. Field In-Place Density and Moisture Content - Crushed stone shall be compacted as specified and indicated. For other backfill and fill materials, minimum test frequency shall be as follows, and no less than two tests per lift:

1. Trenches within roadways: Every 30 linear ft. per lift.

2. Access Pits within roadways: Every 100 sq. ft. or two per lift, whichever is greater.
PART 2 – PRODUCTS

2.1 SAND BORROW

A. Sand borrow shall consist of clean, inert, hard, durable grains of quartz or other hard durable rock free from clay and loam or other deleterious or organic material. Sand borrow shall be used as pipe bedding for all pipes, placed between 6 inches below pipe invert to 6 inches above pipe crown. The sand borrow shall conform to Massachusetts Highway Department (MHD) Specification Designation, M1.04.1, and the following gradation:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>½-inch (12.7mm)</td>
<td>100</td>
</tr>
<tr>
<td>3/8-inch (9.525mm)</td>
<td>85-100</td>
</tr>
<tr>
<td>No. 4</td>
<td>60-100</td>
</tr>
<tr>
<td>No. 16</td>
<td>35-80</td>
</tr>
<tr>
<td>No. 50</td>
<td>10-55</td>
</tr>
<tr>
<td>No. 200</td>
<td>2-10</td>
</tr>
</tbody>
</table>

2.2 COMMON FILL AND ON-SITE MATERIAL GEOTECHNICALLY SUITABLE FOR REUSE ON-SITE AS BACKFILL:

A. Common fill and on-site material geotechnically suitable for reuse on-site as backfill shall be used from the top of the sand borrow or crushed stone to below the gravel subbase layer.

Common fill and on-site material geotechnically suitable for reuse on-site as backfill shall consist of sand and gravel consisting of hard durable particles, and free from trash, ice and snow, tree stumps, roots and other organic matter, and shall conform to the following gradation requirements:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Finer by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-inch (152.4mm)</td>
<td>100</td>
</tr>
<tr>
<td>No. 4</td>
<td>30-80</td>
</tr>
<tr>
<td>No. 40</td>
<td>30-50</td>
</tr>
<tr>
<td>No. 200</td>
<td>0-25</td>
</tr>
</tbody>
</table>

2.3 CRUSHED STONE

Crushed stone shall consist of durable crushed rock or durable crushed gravel stone, free from ice and snow, sand, clay, loam, or other deleterious or organic material.

Crushed stone shall be wrapped in filter fabric, placed in maximum 6-inch thick layers, loose measure, and compacted with a minimum of four passes of a vibratory
plate or roller compactor. The crushed stone shall be uniformly blended and shall conform to the following requirements.

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-inch (25.4 mm)</td>
<td>100</td>
</tr>
<tr>
<td>3/4-inch (19.05 mm)</td>
<td>90-100</td>
</tr>
<tr>
<td>5/8-inch (15.875 mm)</td>
<td>---</td>
</tr>
<tr>
<td>½-inch (12.7 mm)</td>
<td>10-50</td>
</tr>
<tr>
<td>3/8-inch (37.5 mm)</td>
<td>0-20</td>
</tr>
<tr>
<td>No. 4</td>
<td>0-5</td>
</tr>
<tr>
<td>No. 8</td>
<td>---</td>
</tr>
</tbody>
</table>

2.4 CONTROLLED DENSITY FILL (CDF)

A. Controlled density fill shall consist of a cementitious hard excavatable mixture of aggregate, Portland Cement, and air entraining admixtures. The material shall be of the type specified in Massachusetts Highway Department 1998 Standard Specifications for Highway and Bridges, as amended, Type 2E. Controlled density fill shall be used to fill abandoned utilities, for encasement of pipe and utilities, and around the excavation support systems as required by the Engineer.

B. Controlled density fill placed in contact with ductile iron pipe shall utilize a non-fly ash mix design.

2.6 FILTER FABRIC

A. Filter Fabric shall consist of a nonwoven fabric made from polypropylene or polyethylene filaments or yarns.

B. Filter Fabric shall be inert to organic chemicals commonly encountered in the soil.

C. Edges and ends of filter fabric shall overlap a minimum of two feet.

D. Filter Fabric shall conform to the requirements for Subsurface Drainage Geotextile per AASHTO M 288: Geotextile Specification for Highway Applications.

2.7 GRAVEL SUBBASE

Gravel subbase shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings and deleterious materials. The gravel subbase shall be used in the upper one foot of trench backfill material immediately below pavements and graded in accordance with Massachusetts Highway Department (MHD) specification section M1.03.1 as indicated below:
<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-inch</td>
<td>100</td>
</tr>
<tr>
<td>1-1/2-inch</td>
<td>70-100</td>
</tr>
<tr>
<td>3/4-inch</td>
<td>50-85</td>
</tr>
<tr>
<td>No. 4</td>
<td>30-60</td>
</tr>
<tr>
<td>No. 200</td>
<td>0-10</td>
</tr>
</tbody>
</table>

PART 3 – EXECUTION

3.1 GENERAL

A. Do not excavate or fill until the Engineer has reviewed all the required submittals.

3.2 SITE MAINTENANCE

A. Roadway and Site Leveling: Grade roadway and site as to maintain them in a level unrutted condition and to eliminate puddling of surface and subsurface water.

3.3 SUBGRADE PREPARATION AND PROTECTION

A. Proof roll with a vibratory plate compactor or double drum roller (4 passes) the exposed subgrade prior to backfilling and filling operation or placing soil-supported pipeline. Proof rolling shall be performed in the presence of the Engineer.

B. As required by the Engineer, over-excavate any unsuitable materials below the subgrade, and replace with compacted structural fill.

C. Use excavating equipment equipped with a toothless or smooth edged, excavating bucket to expose the pipe trench subgrade to avoid disturbance of the bearing surface.

D. Backfill the overexcavation with crushed stone wrapped in filter fabric or Structural Fill and compact as to the degree indicated herein.

3.4 COMPACTION EQUIPMENT

A. The compaction equipment shall be selected by the Contractor and shall be capable of consistently achieving the specified compaction requirements. The selected compaction equipment shall meet the following minimum requirements:

1. Manually operated vibratory plate compactors weighing no less than 200 pounds with vibration frequency no less than 1600 cycles per minute.
2. Vibratory steel drum roller weighing at least 12,000 pounds.

3. Water jetting and puddling will not be allowed.

3.5 COMPACTION REQUIREMENTS

A. The degree of compaction is expressed as a percentage of the maximum dry density at optimum moisture content as determined by ASTM Test D1557, Procedure C. The compaction requirements are as follows:

<table>
<thead>
<tr>
<th>Area</th>
<th>ASTM Density Degree of Compaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposed subgrade</td>
<td>Proof roll</td>
</tr>
<tr>
<td>Crushed stone</td>
<td>As specified herein</td>
</tr>
<tr>
<td>Sand Borrow</td>
<td>95%</td>
</tr>
<tr>
<td>Gravel subbase</td>
<td>95%</td>
</tr>
<tr>
<td>Trench backfill (on-site fill)</td>
<td>95%</td>
</tr>
<tr>
<td>- below pavements</td>
<td>95%</td>
</tr>
<tr>
<td>- below landscaped areas</td>
<td>92%</td>
</tr>
<tr>
<td>Other areas</td>
<td>92%</td>
</tr>
</tbody>
</table>

B. Moisture Control: Fill that is too wet for proper compaction shall be desiccated, harrowed, or otherwise dried to a proper moisture content to allow compaction to the required density. If fill cannot be dried within 24 hours of placement, it shall be removed and replaced with drier fill at no additional cost to the Owner.

C. Fill that is too dry for proper compaction shall receive water uniformly applied over the surface of the loose layer. Sufficient water shall be added to allow compaction to the required density.

D. Unfavorable Conditions: In no case shall fill be placed in standing water, over unsuitable material, or material that is frozen. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by heavy rains, fill operations shall not be resumed until the moisture content and the density of the previously placed fill are as specified.

E. In freezing weather, a layer of fill shall not be left in an uncompacted state at the close of the day’s operations. Prior to terminating work for the day, the final layer of compacted fill shall be rolled with a smooth wheeled roller to eliminate ridges of soil left by compaction equipment.

F. Compaction Control: In-place density tests shall be made at the Contractor’s expense as the work progresses, to determine the degree of compaction being attained by the Contractor. Any corrective work required as a result of such tests, such as additional compaction, or a decrease in the thickness of layers,
shall be performed by the Contractor at no additional expense to the Owner.

G. The Engineer’s duties do not include supervision or direction of the actual work by the Contractor, his employees or agents. Neither the presence of the Engineer nor any observation and testing performed by him shall excuse the Contractor from defects discovered in his work at that time or subsequent to the testing.

H. Placement: All fill shall be placed in horizontal layers. Fill shall not be placed following the natural contours of the ground. Fill shall be placed starting in the lowest areas working up to finish grades in horizontal layers in the manner specified herein. Each layer of fill should be benched into the existing slope in order to avoid the formation of a shear plane.

I. Surfaces: After backfilling trenches and excavations, the Contractor shall maintain the surfaces of backfill area in good condition so as to present a smooth surface at all times level with adjacent surfaces. The Contractor shall repair any subsequent settling over backfilled area immediately, in a manner satisfactory to the Engineer, and such maintenance shall be provided by the Contractor for the life of this Contract, at no additional expense to the Owner.

J. The finished subgrade of the fills and filled excavations upon which topsoil is to be placed, or pavements are to be constructed, shall not be disturbed by traffic of other operations and shall be maintained in a satisfactory condition until the finished courses are placed. The storage or stockpiling of materials on finished subgrade will not be permitted.

3.6 SEPARATION OF EXCAVATED MATERIAL FOR REUSE

A. Carefully remove acceptable material from excavated areas and store separately for further use as backfill material or for disposal or immediately reuse at the area of excavation as backfill. Refer to Appendix A for acceptable material reuse discussion.

B. Reuse surplus acceptable excavated materials for backfill as indicated and in accordance with Section 02080 – SOIL AND FILL MANAGEMENT; deposit neatly and grade.

3.7 BACKFILL MATERIAL SELECTION

A. Backfill Material Selection: Unless otherwise specified or required, material used for filling and backfilling shall meet the requirements specified under Backfill materials. In general, the material used for backfilling trench excavations within the zone above structures and 6 inches above pipe crowns shall be material removed from the excavation provided that the reuse of these materials result in the required trench compaction and meets the gradation requirements specified for on-site fill. In areas where the bottom of the excavation is in silt and clay, and is below the groundwater table, a working mat and drainage layer of 12 inches of compacted crushed stone
wrapped in filter fabric shall be placed.

B. Place backfill to a maximum loose lift thickness of 9 inches except where used as pipe bedding. Maintain backfill material with a uniform moisture content, with no visible wet or dry streaking, between plus or minus 2 percent of optimum moisture content. The final filled soil mass shall be as uniform as possible in lift thickness, moisture content, and effort required to compact soil mass.

3.8 STRUCTURE AND TRENCH BACKFILL

A. The trenches shall be backfilled as soon as practicable with the material specified herein. All trench backfilling shall be done with special care, in the following manner and as required by the Engineer.

B. Backfill material for pipe bedding shall be deposited in the trench, uniformly on both sides of the pipe, for the entire width of the trench as indicated on the drawings. Sand borrow bedding shall be placed by hand shovels, in layers not more than 4-inches thick in loose depth, and each layer shall be thoroughly and evenly compacted by tamping on each side of the pipe to provide uniform support around the pipe, free from voids. Crushed stone bedding material shall be placed in layers not more than 6-inches thick in loose measure, and compacted with at least 4 passes using a vibratory plate or roller compactor.

C. The balance of the trench with no structures shall be common fill material placed in 9-inch think lifts and compacted up to the bottom of the gravel subbase layer. The common fill material shall be spread in layers not exceeding 9-inches in loose depth and each layer thoroughly compacted by mechanical methods and shall contain no rock, stones or boulders larger than 6-inches in their greatest dimension.

D. All trench backfill under or within 3 feet of the gas transmission main shall be quick-set CDF. Backfill shall be placed in appropriately sized lifts and on both sides of the transmission main simultaneously to ensure that all loads applied to the main by the backfill are properly balanced and that they do not exceed the safe load carrying capacity of the main at any time.

E. All trench backfilling shall be done with special care and must be carefully placed so as not to disturb the work at any time if necessary, timber grillage or other suitable method shall be used to break the fall of material. The moisture content of the backfill material shall be such that proper compaction will be obtained. Backfill shall be made to grades required to establish the proper subgrade for the placement of topsoil or pavement base courses.

F. In backfilling trenches, each layer of backfill material shall be moistened and compacted to a density as specified herein, and in such a manner as to permit the rolling and compaction of the filled trench or excavation with the adjoining earth to provide the required bearing value.
G. Any trenches or excavations improperly backfilled or where settlement occurs shall be reopened, to the depth required for proper compaction, then refilled and compacted with the surface restored to the required grade and condition, at no additional expense to the Owner.

H. During filling and backfilling operations, pipelines will be checked by the Engineer to determine whether any displacement of the pipe has occurred. If the observation of the pipelines shows poor alignment, displaced pipe or any other defects they shall be remedied to meet Engineer and Owner requirements at no additional cost to the Owner.

3.9 BACKFILLING AGAINST STRUCTURES

A. Backfilling against masonry or concrete shall not be done until permitted by the Engineer. The Contractor shall not place backfill against or on structures until they have attained sufficient strength to support the loads (including construction loads) to which they will be subjected, without distortion, cracking or other damage. As soon as practicable after the structures are structurally adequate and other necessary work has been satisfactorily completed, the Contractor, as required by the Engineer, shall make special leakage tests of the structures. After the satisfactory completion of leakage tests and the satisfactory completion of any other required work in connection with the structures, the backfilling around the structures shall proceed.

B. Symmetrical backfill loading shall be maintained. Special care shall be taken to prevent any wedging action or eccentric loading upon or against the structures.

C. In compacting and other operations, the Contractor shall conduct his operations in a manner to prevent damage to structures due to passage of heavy equipment over, or adjacent to, structures, and any damage thereto shall be remedied by the Contractor at no additional expense to the Owner.

3.10 CDF QUALITY CONTROL TESTING DURING CONSTRUCTION

A. Slump: ASTM C143; one test at point of discharge for each day’s placement; additional tests when CDF consistency seems to have changed.

B. Compression Test Specimen: ASTM C31; one set of four (4) standard cylinders for each compression strength test, plus additional sets for each 100 cu yds more than the first 50 cu yds placed in any one day unless otherwise required.

C. Compressive Strength Tests: ASTM C39; one set for each day’s pour plus additional sets for each 100 cu. yds more than the first 50 cu. yds placed in any one day; two specimens tested at 28 days, and two specimens tested at 90 days.

D. Test results will be reported in writing to Engineer, Ready-Mix Producer, and
Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of placement, name of testing service, fill type and class, location of fill batch along route, design compressive strength limits at 28 days and 90 days, fill mix proportions and materials, compressive breaking strength, and type of break for both 28 day tests and 90 day tests.

3.11 TRENCH EXCAVATION

A. For pipe installation in a cradle or within bedding, excavate trench by machinery to, or just below designated subgrade. If material remaining at bottom of trench is disturbed, recompaction shall be required.

B. When pipe is to be laid directly on bottom of trench, do not excavate lower part of trenches by machinery to subgrade. Remove remainder of material to be excavated by use of hand tools just before placing of pipe. Form a flat or shaped bottom, true to grade, so pipe will have a uniform and continuous bearing. Support on firm and undisturbed material between joints, except for limited areas where use of pipe slings have disturbed bottom.

C. Make trenches as narrow as practicable and do not widen by scraping or loosening materials from the sides. Make every effort to maintain sides of trenches firm and undisturbed until backfilling has been placed and compacted.

D. Excavate trenches with approximately vertical sides between springline of pipe and elevation 1 ft. above top of pipe.

3.12 ROCK EXCAVATION

A. Excavate rock and boulders in pipe trenches, before laying pipe, to no less than 6in. all around the pipe. Backfill trench, before pipe is laid, to correct subgrade to the lines and grades of the proposed pipe. Use thoroughly compacted, suitable material or, when so specified or indicated on drawings, same material as required for bedding pipe. Furnish and place at no additional compensation.

B. Fill excess excavation below elevation of the top of bedding, cradle, or envelope with material of same type and placed and compacted in same manner as specified for bedding, cradle, or envelope.

C. Remove excavated boulders or loose rock to a suitable place of disposal.

D. Use excavated rock in backfilling trenches subject to following limitations:
   1. Do not use pieces of rock larger than permitted by the Engineer.
   2. Do not allow rock quantities used in backfill in any location to result in formation of voids.
3. Do not place rock backfill within 16 in. of surface of finish grade.

F. Backfill with material obtained from outside sources in conformance with Section 02210 at no additional compensation, when material suitable for backfilling is not available in sufficient quantity from other excavations.

EXCAVATION NEAR EXISTING STRUCTURES

A. Discontinue digging by machinery when excavation approaches pipes, conduits, or other underground structures. Continue excavation by use of hand tools. Include such manual excavation in work to be done when incidental to normal excavation and under items involving normal excavation.

B. Excavations to remove unsuitable material shall not extend within a 2 horizontal to 1 vertical (2H:1V) envelope below existing structures to remain.

C. Excavate test pits when determination of exact location of pipe utilities or other underground structures is necessary for doing work properly.

D. Execution of any earth excavation shall not commence until the related dewatering, soil and fill management, excavation support systems, and required backfill and fill materials submittals are reviewed by the Engineer and all Engineers’ comments addressed.

E. Carry out program of excavation, dewatering, and excavation support systems to eliminate possibility of undermining or disturbing foundations of existing structures or utilities of the work previously completed under this contract.

F. Excavate to widths that give suitable room for constructing structures or laying and jointing piping.

G. Do not plow, scrape or dig by machinery near to finished subgrade in a manner that would result in disturbance of subgrade.

H. Excavate to lines and grades indicated in an orderly and continuous program.

I. Establish limits of excavation to allow adequate working space for installing forms and for safety of personnel.

J. Excavate to elevations indicated, or deeper, as required by the Engineer, to remove unsuitable subgrade material.

K. Exercise care to preserve material below and beyond the lines of excavations.

L. Boulders, rock fragments, and concrete less than one-half cubic yard encountered during excavation shall not be included for payment as rock.
3.15 REMOVAL OF SUBSURFACE OBSTRUCTIONS

A. Remove indicated or approved subsurface structures and related obstructions to complete the work.

B. Promptly notify the Engineer when any unexpected subsurface facilities are encountered during excavation such as utility lines and appurtenances, walls and foundations.

3.16 UNAUTHORIZED EXCAVATION

A. When the bottom of any excavation is excavated beyond limits indicated or specified, backfill with crushed stone wrapped with non-woven geotextile fabric. No additional payment will be made for the excavation of backfill or unauthorized excavation.

3.17 CARE AND RESTORATION OF PROPERTY

A. Do not use or operate tractors, bulldozers, or other power-operated equipment on paved surfaces when their treads or wheels of which are so shaped as to cut or otherwise damage such surfaces. Restore surfaces damaged by the Contractor's operations to a condition at least equal to that in which they were found immediately before work commenced. Use suitable materials and methods for such restoration.

3.18 POLLUTION CONTROL

A. During progress of work, conduct earth-moving operations and maintain work site so as to minimize the creation and dispersion of dust.

B. Separation of Excavated Material for Reuse: Remove only existing pavement and all other surface materials, which may include concrete slabs, cobblestones, rail ties, by saw cutting that is necessary for prosecution of work.

PART 4 – COMPENSATION (Not Used)

END OF SECTION 02210
SECTION 02500

PAVING, SIDEWALKS AND CURBING

PART 1 – GENERAL

1.1 DESCRIPTION

A. Furnish and install paving on all roadway areas as indicated and specified.

B. Pavement and surfacing shall be constructed in courses and in close conformity with the lines, grades, compacted thickness and cross sections shown on the plans and as required in accordance with these specifications.

C. The Contractor shall take all reasonable measures to assure proper drainage on the final surface of the roadway. Pavement that does not drain properly due to poor workmanship shall not be accepted by the Owner and shall be replaced by the Contractor at no additional cost to the Owner.

D. Reference is made herein to the Commonwealth of Massachusetts Department of Transportation, Standard Specifications for Highways and Bridges, latest edition, and all addendums/supplemental specs hereinafter referred to as the "Standard Specifications." All references to method of measurement, basis of payment, and payment items in the Standard Specifications are hereby deleted. References made to particular sections or paragraphs in the Standard Specifications shall include all related articles mentioned therein.

1.2 RELATED WORK

A. Division 1 – General Requirements

B. Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING

1.3 SUBMITTALS

A. Shop Drawings: Submit the following in accordance with the General Conditions of Contract and Section 01300 – SUBMITTALS:

1. Provide copies of materials certificates signed by material producer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.

2. Design Data: Submit design mix for asphalt base, binder and top course.
1.4 GRADE CONTROL
   A. Establish and maintain required lines and elevations.

1.5 SEQUENCING AND SCHEDULING
   A. Paving will be required unless permission not to do so is received from the Owner. Temporary cover shall be maintained a minimum of 90 days in local streets.
   B. The Contractor shall provide temporary markings on the temporary cover where existing markings are removed, at no additional cost to the Owner.
   C. Use of steel plates require the Contractor to notify the Owner’s Department of Public Works prior to use. If approved, steel plates shall be recessed into the roadway and welded as required.

1.6 QUALITY CONTROL
   A. The Engineer may require the Contractor to remove at their own expense, any defective mix not conforming to the specified job mix formula within the stipulated tolerances. Samples of the actual mixture in use will be taken as many times daily as necessary and the mixtures shall be maintained uniform for the project. The Engineer may suspend further approval for use of the Plant mixtures if the mixtures do not conform to the specified requirements.
   B. Do not place materials when underlying surface is muddy, frozen, or has frost, snow, or water thereon.

1.7 GUARANTEE
   A. During the one-year guarantee period, the Contractor shall maintain the surfacing and shall promptly fill with similar material in compliance with the Specifications, any depressions and holes that may occur during that time period.

PART 2 – PRODUCTS

2.1 MATERIALS
   A. Gravel Subbase
      1. Materials including preparation of subgrades shall meet the requirements of the applicable sections of the Specifications.
      2. The trench gravel subbase shall be used in the upper 1-foot of trench backfill material immediately below pavements and graded in accordance with Massachusetts Highway Department “Standard
Specifications” Section M1.03.1 and applicable subsections of Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING.

B. Hot Mix Asphalt Pavement – Base Course

1. Asphalt Base Course and Asphalt Tack Coat shall conform to the applicable subsections of Section 460, Hot Mix Asphalt Pavement, of the Massachusetts Highway Department’s “Standard Specifications”.

2. Tack coat shall be RS-1 emulsion.

C. Hot Mix Asphalt Pavement – Binder Course

1. Asphalt Binder Course shall conform to the applicable subsections of Section 460, Hot Mix Asphalt Pavement, of the Massachusetts Highway Department’s “Standard Specifications.”

D. Hot Mix Asphalt Pavement – Top Course

1. Asphalt Top Course shall conform to the applicable subsections of Section 460, Hot Mix Asphalt Pavement, of the Massachusetts Highway Department’s “Standard Specifications.”

E. Hot Poured Rubberized Asphalt Sealer

1. Hot Poured Rubberized Asphalt shall conform to Federal Specification Number SS-S-1401 as required in Section 460, Hot Mix Asphalt Pavement, of the Massachusetts Highway Department’s “Standard Specifications.”

F. Pavement Markings

1. Temporary and permanent markings shall conform to MHD: M7.01.23 – Fast Drying White Water-borne Traffic Paint (Reflectorized).

G. Concrete Sidewalks

1. Cement Concrete for Sidewalks, Driveways and Intersections: Cement concrete shall conform to the Commonwealth of Massachusetts Highway Department, Standard Specifications for Highway and Bridges, M4.02.00 through M4.02.12 and be 4000 PSI at 28 day test, ¾-inch coarse aggregate, 610 pounds cement per cubic yard, 6% air entrained (AASHTO - M154), Type A water reducing admixture (AASHTO - M194), 3 to 4-inch slump, and Type II dark-colored by adding 1-1/2 to 2 lbs. of lamp black per cubic yard at the plant. Cement concrete shall contain micro-fiber
added during batching at the plant to insure uniform distribution.

2. **Micro-fiber:** The cement concrete shall contain 1 pound of polypropylene micro-fiber per cubic yard. Fibers shall be 1/2” or 3/4” 100% polypropylene fibers, maximum 3 denier, complying with ASTM C 1116, Type III, Par. 4.1.3. Fibers per pound shall be not less than 50 million individual fibers. The micro-fiber shall be used in accordance with the manufacturer’s specifications.

3. **Curing Compound:** Clear, Waterborne, Membrane-Forming Curing Compound, 18 to 22 percent Solids.

4. **Alkaline Resistant Protective Penetrating Concrete Sealer:** Sealers shall be clear, VOC compliant and solvent-based. Sealer shall be deep penetrating.

5. **Expansion Joints:** Shall be 3/8” thick polyethylene foam and ¼” thick polyethylene foam conforming to ASTM D1751.

6. **Water:** Potable.

H. **Forms:** Shall be in accordance with Standard Specification Section 701.61A.

**PART 3 – EXECUTION**

3.1 **PROJECT SITE CONDITIONS/PROJECT DESCRIPTION**

A. **Existing Conditions:**

1. Drawings show approximate location of existing structures along pipeline route.

B. **In general, the following pavement repairs shall be made:**

1. Trenches on all streets will be backfilled daily. Upon completion of water main installation, disinfection, testing and service connection, trenches shall be cut back 1’ on either side to a depth of 14.5” and filled with 12” of gravel and 2.5” of hot mix asphalt binder course. After a winter settlement or 90-day period, the temporary cover shall be overlayed with a 1.5-inch hot mix asphalt top course pavement flush with existing grade.

2. Driveway repairs shall consist of a 2-inch permanent binder course pavement placed on a weekly basis. After a 90-day minimum period, or a winter settlement period, a 1-inch, full width permanent wearing course overlay shall be placed.
3. Concrete sidewalk or driveway repair shall consist of a 4-inch thick (walks) or 6-inch thick (driveways and/or pedestrian ramps) repair. Concrete shall be placed after a 90-day settlement period or winter settlement period.

5. Furnish and remove steel plates as required.

6. Driveway aprons and waterways shall be paved as part of the work.

7. The paving thicknesses specified above may vary based on permit or field requirements.

8. Curbing shall be removed and reset as part of the work where required.

3.2 SUBGRADE PREPARATION AND PROTECTION

A. Bring subgrade to required grade as necessary prior to placing subbase material.

B. As required by the Engineer, over-excavate on-site fill material and any unacceptable materials below the subgrade. Utilize excavating equipment equipped with a toothless or smooth edged, excavating bucket to expose the on-site fill material and unacceptable materials to avoid disturbance of the bearing surface.

C. Proof roll the overexcavated subgrade prior to placing crushed stone.

D. Backfill the overexcavation with crushed stone and compact as indicated in Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING.

3.3 PLACEMENT OF SUBBASE

A. Do not begin placement of subbase and paving work until deficient subgrade areas have been corrected and are ready to receive paving.

B. Subbase under roadway shall be installed and compacted as covered in the Contract Drawings and in Section 02210 – EARTH EXCAVATION, BACKFILL, FILL AND GRADING.

3.4 HOT MIX ASPHALT BASE COURSE

A. Weather Limitations

1. Apply prime and tack coats when ambient temperature is above 50 deg.F (10 deg.C), and when temperature has not been below 35 deg.F (1 deg.C) for 12 hours immediately prior to application. Do not apply
when subbase is wet or contains an excess of moisture.

2. Base course pavement for temporary pavement may be placed when air temperature is above 30 deg.F (-1 deg.C) and rising.

B. Placement

1. Base course shall be spread and compacted to a finished thickness indicated on the Contract Drawings. A smooth even surface shall be produced.

3.5 HOT MIX ASPHALT TOP COURSE

A. Weather Limitations

1. Construct asphalt surface course when atmospheric temperature is above 40 deg.F (4 deg.C) and when base is dry.

B. Settlement Period

1. After a 90-day minimum period, or a winter settlement period, a permanent pavement top course shall be installed in accordance with the requirements of the trench paving detail provided in the drawings.

B. Placement

1. Top course shall be spread and compacted, to the width required in the Contract Documents and to a finished thickness indicated in the Contract Documents. A smooth, even surface shall be produced. Overlays shall be installed after the street has been cold planed or as approved by the Owner and Engineer.

2. Apply tack coat at a rate of 0.05 to 0.10 gallons per square yard over the base and binder courses. Apply material to penetrate and seal, but not flood, surface. Cure and dry as long as necessary to attain penetration and evaporation of volatile.

C. Placing Mix

1. Place hot mix asphalt mixture on prepared surface, spread and strike-off. Spread mixture at minimum temperature of 225 deg.F (107 deg.C). Place inaccessible and small areas by hand. Place each course to required grade, cross-section, and compacted thickness. Protect all adjacent construction from staining with mix or damage by mechanical equipment. Clean, repair or replace any construction stained or damaged at no additional cost to the Owner.

2. Place pavement in strips not less than 2-feet wide, unless otherwise
acceptable to Engineer. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete binder course for a section before placing top course.

3. The Contractor shall supply an approved Dial Type Asphalt Thermometer (Range 10º C to 260º C) for each paving machine in operation on the project. The thermometer shall remain the property of the Contractor upon completion of the project.

D. Rolling

1. Begin rolling when mixture will bear roller weight without excessive displacement. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.

2. Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling, and repair displaced areas by loosening and filling, if required, with hot material.

3. Second Rolling: Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been thoroughly compacted.

4. Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained maximum density.

5. Patching: Remove and replace paving areas mixed with foreign materials and defective areas. Cut-out such areas and fill with fresh, hot mix asphalt. Compact by rolling to match the surrounding surface density and smoothness.

6. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked by wheel traffic.

E. Existing Pavement/Joints

1. The edges of existing pavement, which are to remain, shall be saw cut to even, straight edges. This includes road and trench edges. Any joints at junction of old and new pavements shall be sealed with an asphalt emulsion and covered with sand.

2. Make joints between old and new pavements, or between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density and smoothness as
other sections of asphalt course. Clean contact surfaces and apply tack coat.

F. Compaction

1. The asphalt mixture shall be compacted to at least 95% of the density achieved on the laboratory testing of the design mix for the project. Density will be checked by the Nuclear Density Gage Method, ASTM D2950. Testing shall be completed by Contractor at no expense to Owner for every 200 square yards of surface area placed.

G. Field Quality Control

1. Thickness: Test in-place asphalt courses for compliance with requirements for thickness. Repair or remove and replace unacceptable paving as required by Engineer, and at no additional cost to the Owner. In-place compacted thickness will not be acceptable if exceeding following allowable variation from required thickness:

   a. Base or Binder Course: 1/4-inch, plus or minus.

   b. Surface Course: 1/4-inch, plus or minus.

H. Crack Sealing

1. Crack sealing shall be performed where required by the Engineer with modified asphalts (e.g. hot poured rubberized asphalt sealer). Prior to sealing a crack all compressible material shall be removed by high-pressure air or routing. If grass or vegetation is present in the crack the Contractor shall inject a liquid herbicide to prevent future growth. For small hairline cracks, an asphalt slurry mixture type SS-1, SS-1h shall be squeegeed over the surface and forced in the cracks. The slurry shall be maintained at a significant fluidity to be able to flow into the hairline cracks. Sealing of cracks shall be considered to be complete upon review and approval by the Engineer.

I. Liquid Asphalt Emulsion

1. Liquid Asphalt Emulsion shall be applied prior to installation of asphalt as incidental to all pavement pay items. Emulsion shall be AC-20 conforming to AASHTO M226 and shall be applied at a temperature over 100 degrees F by an emulsion truck.

2. The emulsion truck shall have pneumatic tires of such width and number that the load produced on the surface shall not exceed 672 lbs/in of tire width, and it shall be designed, equipped, and operated so that at an even heat the emulsion may be applied uniformly on
variable widths of surface at a readily controlled rate of 1/20 gal/square yard or as required by the Engineer.

3. The emulsion shall be applied within a pressure range of 25 psi to 75 psi. Distributor equipment shall include a tachometer, pressure gauges, volume-measuring devices, and a thermometer for reading the temperature of tank contents. The distributor shall be self-powered and shall be equipped with a power unit for the pump and full circulation spray bars adjustable laterally and vertically.

3.6 RAISING AND ADJUSTING CASTINGS

A. Prior to top course paving, all existing City or Owner owned catch basin and manhole castings and curb and valve boxes shall be raised, if necessary, to the proper grade by the Contractor.

B. Castings owned by private utilities shall be raised by the responsible utility. The Contractor shall be responsible for coordinating this work.

C. The method of adjusting catch basin and manhole castings shall be as follows: Cut around catch basin or manhole castings a minimum of 8 inches from casting. Excavate and, if required, rebuild up to 12 inches of masonry below the bottom of the casting. Backfill with suitable material and compact to bottom of casting. Place high, early strength cement concrete or hot mix asphalt collar, as required by the Authority, to approximately 1½ inches below the raised casting grade. Masonry work shall conform to Section 02252 - MANHOLES and Section 02590 – BRICK MASONRY.

D. The method of raising curb and valve boxes shall be as follows: Cut around valve box a minimum of 8 inches from valve box. Excavate as required and raise the valve box. Pour high early strength cement concrete or hot mix asphalt collar, as required, to approximately 1½ inches below the top of the valve box.

3.7 PAVEMENT MARKINGS

A. The Contractor shall replace all Reflectorized pavement markings removed or covered-over in carrying out the work, and as directed by the Engineer, no sooner than 48 hours after completion of overlay pavement. Markings shall conform to the latest standards of the municipality or agency having jurisdiction over the roadway.

B. The Contractor shall provide temporary markings on the temporary pavements where existing markings are removed at no additional cost to the Owner.

C. Painted crosswalks disturbed during construction shall be cleaned and repainted to match preconstruction conditions. Crosswalks requiring repairing shall be repainted in their entirety.

3.8 SIDEWALK AND DRIVEWAY REPLACEMENT
A. Gravel Sidewalks and Driveways:

1. Gravel sidewalks shall be restored to a condition at least equal to that existing immediately before the work was started.

B. Cement concrete sidewalks, and driveways:

1. Construct in accordance with MHD Section 701, Sidewalks, Wheelchair Ramps and Driveways.

2. Use 6x6, W10xW10 welded wire reinforcement.

3. Concrete sidewalks shall be 4-inches thick and concrete driveways shall be 6-inches thick.

4. The subgrade for the walk or driveway shall be shaped to a true surface conforming to the proposed slope of the walk, thoroughly rolled at optimum moisture content, and tamped with a power roller weighing not less than one ton and not more than 5 tons. All depressions occurring shall be filled with suitable material and again rolled or tamped until the surface is smooth and hard.

5. After the subgrade has been prepared, a subbase of gravel at optimum moisture content shall be placed, thoroughly rolled by a power roller, and tamped. The gravel shall be a minimum of 8 inches in thickness.

6. The forms shall be smooth, free from warp, strong enough to resist springing out of shape, and deep enough to conform to the thickness of the proposed walk or driveway. All mortar or dirt shall be completely removed from forms that have been previously used. The forms shall be well staked, thoroughly braced, and set to the established lines with their upper edge conforming to the grade of the finished walk or driveway.

7. The finished surface shall have sufficient pitch from the outside edge to provide for surface drainage. This pitch shall be 1/4 of an inch per foot unless otherwise directed by the Engineer. Before the concrete is placed, the subbase for sidewalks shall be thoroughly dampened until it is moist throughout but without puddles of water.

PART 4 – COMPENSATION (Not Used)
PART 1 GENERAL

1.1 SCOPE

A. The Work of this section includes the furnishing of all labor, tools, equipment and materials necessary to perform all operations required for the construction of water mains including fittings, valves, hydrants, restraint systems, services and all other related items necessary to complete the Work as shown on the Drawings and as specified.

B. All products and materials shall conform to the appropriate and latest ANSI and AWWA Standards and as otherwise specified hereinafter.

C. All materials supplied shall be manufactured and assembled in the United States or Canada, unless otherwise approved by the Engineer.

1.2 SUBMITTALS

A. Shop Drawings and/or brochures shall be submitted for all items to be furnished in accordance with the provisions of Section 01300 - Submittals.

B. Submittals required under this section include, but are not limited to the following:
   1. Pipe and fittings.
   2. Hydrants.
   3. Valves.
   4. Transition couplings.
   5. Warning tape and tracer wire.
   6. All components related to services.
   7. Gate and service boxes.
   8. Restraint systems including thrust restraint glands and other miscellaneous items.
   9. Insulation
   12. Country of manufacture and origin data for restraints, fittings, valves, hydrants, curb and valve boxes, service line components.
1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

A. All pipe when shipped shall be packed and separated by wood separators such that pipe to pipe contact is prevented during transit and/or storage.

B. The loading, trucking, unloading, and handling of pipe and appurtenant materials shall be done by the Contractor. Care shall be taken so as not to damage the pipe, appurtenant materials or the street surface. Dropping of materials such as but not limited to pipe, special castings, valves, and hydrants, directly from the trucks upon the ground will not be permitted. Suitable effective buffers or runners shall be provided. Metal chain shall not be used for lifting materials. The Contractor shall be responsible for any damage done to the pipe or appurtenant materials until they are accepted in the completed Work.

C. Pipes may be stored within the roadway right-of-way, outside of travelled way, at locations approved by the Engineer. All PVC pipe shall be covered with an appropriate tarp until installation. Distribution of pipeline along the line of Work, beyond materials for one day supply at any one time, will not be permitted, unless approved by the Engineer. The Contractor shall not obstruct driveways, sidewalks, or walkways nor shall pipeline materials be placed on private property.

PART 2 MATERIALS

2.1 POLYVINYL CHLORIDE (PVC) PIPE

A. All polyvinyl chloride (PVC) pipe shall be designed and manufactured for potable water usage in accordance with ANSI/AWWA C900-16. PVC pipe shall have Cell Classification 12454 in accordance with ASTM D1784. PVC pipe shall be DR 25 with a long-term working pressure rating of 165 psi and a short term surge pressure rating of 264 psi. PVC pipe shall be fully compatible with mechanical joint fittings and valves. All PVC pipe shall be Blue Brute C900 or equal. Pipe shall be manufactured by JM Eagle, Livingston, NJ, IPEX Inc., Pineville, NC, or approved equal. Pipe shall be color blue.

PVC pipe shall be homogenous throughout, be free of nicks, cracks, inclusions, voids and other defects. Pipe surfaces shall be free from nicks and scratches that extend 10 percent or more into the pipe walls or bells. Any pipe having such defects shall be removed and replaced at no cost to the Owner.

PVC pipe shall be Blue Brute C900 or equal. Pipe shall be manufactured by JM Eagle, Livingston, NJ, IPEX Inc., Pineville, NC, or approved equal. Pipe shall be color blue.

B. Gaskets and lubricants intended for use with PVC pipe, couplings, and fabricated fittings shall be made of materials compatible with the pipe and with each other when used together.
Gaskets and lubricants shall be suitable and approved for use with potable water not adversely impacting the quality of water contained within the pipe.

Gaskets shall be elastomeric with one gasket furnished per each length of pipe. Gaskets shall meet requirements of ASTM F477 for high head applications. Head applications shall be 165 psi.

The pipe shall be in nominal laying lengths of twenty (20) feet.

<table>
<thead>
<tr>
<th>Pipe Diameter (inches)</th>
<th>Thickness (inches)</th>
<th>Pressure Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>0.276</td>
<td>DR25</td>
</tr>
<tr>
<td>8</td>
<td>0.362</td>
<td>DR25</td>
</tr>
<tr>
<td>10</td>
<td>0.444</td>
<td>DR25</td>
</tr>
<tr>
<td>12</td>
<td>0.528</td>
<td>DR25</td>
</tr>
</tbody>
</table>

B. PVC pipe shall have either push-on or mechanically restrained joints. Mechanically restrained joint pipe shall be used at joints before and after any fittings to resist the movement of the pipe, and at locations indicated on the Drawings. Refer to the table within this section of Specifications entitled “Length of Pipe to be Restrained” for the length of restrained joint pipe that is required on each side of fittings to resist the forces developed at fittings. All other pipe shall have push-on joints. Pipe gaskets shall be as specified hereinbefore.

2.2 DUCTILE IRON FITTINGS

A. Fittings shall be mechanical joint ductile iron. Hydrant branches shall have valve anchoring tees. Fittings shall conform to ANSI/AWWA C110/A21.10 and ANSI/AWWA C111/A21.11. Compact fittings shall conform to ANSI/AWWA C153/A21.53.

B. All ductile iron fittings shall be class 350 and conform to the weights and dimensions shown in DIPRA Handbook of Ductile Iron Pipe and be provided complete with all joint accessories. All fittings shall be made in America.

C. Plugs, caps and blank flanges shall be ductile iron and shall conform to the weights and dimensions shown in the latest edition of the DIPRA Handbook of Ductile Iron Pipe and be provided complete with all joint accessories.
D. The interior surface of all fittings shall be cement-mortar lined and seal coated with asphaltic materials as specified hereinbefore for ductile iron pipe.

E. Fittings for restrained joint pipe systems shall be as manufactured specifically for the restrained joint pipe system and shall be designed and manufactured as specified previously for ductile iron fittings.

2.3 TRANSITION COUPLINGS

A. Transition couplings shall be sleeve type design consisting of center sleeve and two compression end rings meeting AWWA C219. The center sleeve shall be ASTM A 53 Grade A steel with 100% fusion bonded epoxy coating meeting NSF-61 requirements. The transition couplings shall be specifically designed for the designated connection. End rings shall include EPDM gaskets, stainless steel spanner and stainless steel nuts and bolts. The Coupling shall be long body type with minimum center sleeve length of 12 inches.

2.4 RESILIENT WEDGE SEATED GATE VALVES AND VALVE BOXES

A. Valves shall be Resilient Seated Wedge Gate Valves as manufactured by Kennedy Valve Company or Clow Valve Company.

B. Resilient wedge gate valves shall be iron body, resilient seated type. The valves shall be designed for minimum 200 psi working pressure and 400 psi test pressure. Valves shall have corrosion resistant fusion-bonded interior and exterior coatings.

C. Valves are to have O-ring seals and a nonrising stem. Valves shall have a 2-inch operating nut. Valves shall open left.

D. Resilient gate valves shall meet the most recent version of the AWWA standard specification AWWA C509. Reduced wall valves (C515) will not be accepted.

E. Resilient wedge valves shall have mechanical joint ends suitable for use with restraints specified in Section 02615.

F. Valves shall have a 10 mil minimum thickness factory applied epoxy coating on interior and exterior surfaces. Epoxy shall be suitable for potable water usage and NSF 61 certified.

G. Tapping valves shall be resilient gate valves as specified above with the following exceptions. Tapping valves shall be full port opening and have flanged by mechanical joint ends.

H. Valve boxes shall be manufactured in the United States and be cast iron, tar coated, sliding, heavy pattern type, consisting of three (3) pieces; a flanged bottom piece, a flanged top piece, and a cover with two (2) lifting holes and the word "water" cast on the top. A minimum 6-inch overlap is required between sliding sections. The inside diameter of boxes shall be at least 5-1/4-inches and lengths shall be as necessary to suit
I. Valve boxes shall be straight, plumb and centered over valve.

2.5 HYDRANTS

A. Hydrants shall be traffic type with two sections held together with a break flange. The Owner is standardized on dry barrel hydrants of the following manufacturer, model and specifications:

<table>
<thead>
<tr>
<th>Manufacturer and Model</th>
<th>American Darling B-62-B-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Thread</td>
<td>National Standard</td>
</tr>
<tr>
<td>Number of Outlets</td>
<td>2-1/2 inch hose connection (2 required)</td>
</tr>
<tr>
<td></td>
<td>4-1/2 inch steamer connection (1 required)</td>
</tr>
<tr>
<td>Diameter Valve Opening</td>
<td>5-1/4 inches</td>
</tr>
<tr>
<td>Diameter of Barrel</td>
<td>7- inches</td>
</tr>
<tr>
<td>Hub</td>
<td>Mechanical joint</td>
</tr>
<tr>
<td>Direction of Opening</td>
<td>Open Left</td>
</tr>
<tr>
<td>Depth of Bury</td>
<td>Five (5) feet Six (6) inches (minimum)</td>
</tr>
</tbody>
</table>

Equal approved models will be considered.

A. The Owner is standardized on hydrants with 5’-6” depth of bury. However, the Contractor shall anticipate furnishing and installing hydrant extensions where specified and at other locations as may be required to field conditions. The Contractor shall field measure and determine the proper length extensions prior to ordering the hydrant extensions. Hydrant barrel extension shall be as manufactured by the hydrant manufacturer and shall include all couplings, pins, flanges, gaskets, nuts and bolts, and other accessories to provide a complete installation. Hydrants shall be manufactured and assembled in the United States.

B. Hydrants shall be designed for 250 PSI working pressure and shall conform in every respect to the AWWA C502. Hydrants shall be installed with restraint glands and accessories as specified in these specifications for mechanical joints.

C. Hydrants shall be given two coats of quality paint after installation. The paint system for the hydrants shall be approved by the Engineer and the color system shall match the Owner’s existing hydrants.
D. Hydrants shall be manufactured within the past 12 months as determined from the date stamped on each hydrant.

E. Each hydrant shall be furnished with a hydrant marker. The markers shall be 60 inches top flange mount with fiberglass rod, stainless steel spring and a flag. The markers shall be Product No. 404-FT as manufactured by SPK Steel Fabrication, Fitchburg, MA or approved equal models by others. The flags shall be 4” x 5” Mini Flag with two reflective bands and shall be suitable for attachment to the markers. The flags shall be Product No. 404-MNF as manufactured by SPK or approved equal.

2.6 SERVICES

A. Unless otherwise specified, all pipe for 1-inch services and 1-inch mains shall be copper Type K tubing. Tubing shall meet Federal Specification WW-T-7796 and conform to ASTM B-75, B-88 and B-68 as they apply to copper tubing.

2.7 CORPORATIONS, CURB STOPS AND SADDLES

A. All corporations, stops, fittings and valves shall be manufactured in accordance with AWWA Standard C-800, latest revision, and as further specified in these technical specifications.

B. Any brass part of the fitting or valve in contact with potable water shall be made of a “No-Lead Brass”, defined for this specification as UNS Copper Alloy C89520 in accordance with the chemical and mechanical requirements of ASTM B584, or copper alloy CDA No. C89833. This “No-Lead Brass” alloy shall contain not more than one fifth of one percent (0.20% or less) total lead content by weight.

C. Any brass part of the fitting or valve not in contact with potable water shall be made of 85-5-5-5 brass as defined for this specification as UNS Copper Alloy C83600 per ASTM B62, ASTM B584 and AWWA C-800.

D. All brass fittings and valves shall be certified by an ANSI accredited test lab per ANSI/NSF Standard 61, Drinking Water Components – Health Effects, Section 8. Proof of certification is required.

E. Brass fittings and valves shall comply with the Safe Drinking Water Act, and the U.S Environmental Protection Agency.

F. All brass fittings and valves shall have the manufacturers name or trademark integrally stamped or cast on it. Another marking identifying the “no lead” brass alloy, e.g., ‘NL’, shall be cast or stamped on the fitting or valve.
G. The corporation stops shall meet the most recent revision of the AWWA standard "Threads for Underground Service Line Fittings" (AWWA C800). Corporation stops shall be ball type, brass body, lead free, and designed for 300 psi pressure. Stops to have stainless steel stem, two Buna-N O-ring seals, AWWA threaded inlet, compression outlet, Teflon ball seats. Sizes shall be the same as the water service line. Corporation stops shall be Series 301 by Cambridge Brass, or equal product by McDonald, or equal.

H. Curb stops shall be reduced port, ball type, with brass body and handle, and shall be rated for 300 psi. Drains shall not be provided and curb stops must be lead free and suitable for use with tubing specified hereinbefore. Curb stops shall have two Buna-N O-ring stem seals, stainless steel stem, compression ends, rubber ball seat, and integral check stop that provides 90-deg rotation. Sizes shall be the same as the water service line. Curb stops shall be ball curb valves, product # 47880-eb2q by McDonald, or equal.

I. Curb stop boxes shall be cast iron Erie type with Asphalt cap in place. Asphalt cap shall have a brass “Pent” nut in the center such that when the cap is removed, the neck of the curb box is exposed. Curb stop box shall be adjustable sliding type and shall have a steel operating rod. Curb box shall be painted for corrosion protection.

2.8 THRUST RESTRAINT GLANDS

A. Thrust restraint glands shall be used on all mechanical joint fittings, valves, hydrants and sleeves. The thrust restraint system shall incorporate individually activated gripping surfaces integral to the follower gland that makes up the mechanical joint. The restraints shall be designed for use on plain end PVC pipe attached to mechanical joint fittings and appurtenances.

B. Gland body, wedges and wedge actuating components shall be cast from grade 65-45-12 ductile iron material per ASTM A536. Gland dimensions shall be such that they can be used with standard mechanical joint bells and tee head bolts that conform to the latest revision of ANSI/AWWA A21.11/C111 and ANSI/AWWA A21.53/C153. Twist-off nuts, sized the same as tee-head bolts, and shall be used to ensure proper actuating of restraining devices. The mechanical joint restraint shall have a working pressure of at least 165 psi with a minimum safety factor of 2:1.

C. Restraints shall be furnished with manufacturer approved coating system. The coating shall consist of a minimum of 2 coats of liquid thermoset epoxy coating with heat cure applied after each coat.

D. Each restraint shall be furnished with an identification number listing year, day, plant and shift. The identification data shall be cast into the gland body.
E. Glands shall be specifically designed for use with mechanical joint ductile iron pipe, fittings and valves. Glands shall be Series 2000PV Mechanical Restraint for PVC Pipe as manufactured and assembled by EBBA Iron, East Land, Texas or equal and be complete with gaskets, bolts, nuts, and other related accessories to provide complete installation. Foreign manufactured and/or assembled restraints shall not be allowed.

F. Restraints for PVC C-900 pipe push-on joints shall be Series 1900 restraint harnesses. Harnesses shall be manufactured of ductile iron conforming to ASTM A536. Restraints shall be coated with Mega-Bond coating system as described hereinbefore. The combination of the restraints and fasteners shall have pressure rating of 165 psi.

G. The push-on joint restraints shall utilize a split serrated ring to grip the plain end and the barrel of the pipe behind the bell. A sufficient number of bolts shall be used to connect the restraint rings.

H. The push-on joint restraint harness shall be manufactured and assembled by EBBA Iron, East Land, Texas, and be complete with gaskets, bolts, nuts, and other related accessories to provide complete installation. Foreign manufactured and/or assembled restraints shall not be allowed.

2.9 INSULATION

A. Insulation shall be manufactured by Thermal Pipe Systems, Braintree, Massachusetts, Atlas Insulation, Ayer, Massachusetts or Insulated Piping Systems Inc., Canton, Massachusetts, or other approved manufacturer. Insulation shall be factory foamed-in-place polyurethane foam insulation having nominal thickness of 2", with an in-place density of 2.5 pcf, and a "K" factor of 0.14 BTU/in./hr./°F/sq.ft. Straight joints between insulated pipe lengths, and the end sections of non-insulated pipe, shall be sealed with heat shrinkable wrap-around polyethylene as supplied by manufacturer and installed in field by contractor. Insulation jacket shall be 20-gauge corrugated aluminum preformed to be fastened with stainless steel screws and bands. Jacket shall have one layer of one mil. polyethylene film with a protective coat of 40-lb. virgin kraft paper to act as a moisture and galvanic corrosion barrier.

B. Insulation shall be provided for water main installed with less than 5 feet of cover.

2.10 POLYETHYLENE ENCASEMENT

A. Polyethylene encasement or wrap shall be eight (8) mil thick tubes or sheets manufactured in accordance with AWWA C105 (ANSI A21.5). Polyethylene encasement shall be used at all gas crossings, and at locations directed by the Engineer.
2.11 WARNING TAPE

A. Warning tape shall be detectable metallic lined plastic tape manufactured specifically for warning and identification of buried piping. Tape shall be detectable by an electronic instrument. Provide tape in rolls of 6-inches wide by 4 mil thick, solid blue in color with continuously printed caption in black letter, reading “Caution – Water Line Buried Below”. Use permanent code and letter coloring unaffected by moisture and other substances in the trench backfill.

2.12 OTHER MATERIALS

A. Furnish all other materials required for complete installation.

PART 3 EXECUTION

3.1 INSTALLATION OF PIPE, FITTINGS AND APPURTENANCES

A. Pipes shall be thoroughly cleaned before being installed. Particular attention shall be paid to the proper positioning of the elastomeric gaskets. Jointing of pipe and fittings shall be done in accordance with the manufacturers written instructions.

B. PVC main shall be laid in a bed of clean sand and hand backfilled and hand compacted to a height of 12-inches above the top of the pipe. Mechanical compactors shall not be used until a compacted depth of 12-inches above the top of pipe has been achieved.

C. Temporary watertight plugs shall be utilized at the end of each working day and periods of no-work to prevent the intrusion of silt, debris and water into the pipes. When working in areas with a high potential for flooding of the pipe from groundwater, streams, storm drains, or other means, a temporary plug shall be provided on each pipe length during installation.

D. In the event of flooding of the pipe, all pipe laying shall cease until the pipes have been thoroughly cleaned and disinfected, as determined by the Engineer.

E. Pipe shall be joined and laid in accordance with the manufacturer's latest published instructions.

F. Pipe shall not be laid with deflection of more than one-half (1/2) the maximum deflection as recommended by the manufacturer.
G. When joined together, pipes shall form a smooth continuous line and grade on straight sections and on curved sections (both vertical and horizontal) shall have uniform deflections within the required limits and conforming in general to the line and profile of adjacent roadways or easements. Location of rubber rings shall be determined with a checking gauge before backfilling the pipe.

H. Backfill shall be placed on both sides of the pipe and compacted simultaneously with approved tamping bars for the full length of pipe. Bell holes shall be excavated as necessary to ensure that the pipes and not the pipe bells are bearing the weight of backfill and the traffic load. Mechanical compaction shall not be utilized until sand backfill has been placed and hand compacted to a depth of 12-inches above top of pipe.

I. Bells or other joints shall not be installed directly under existing utilities or structures. Use short or random lengths to avoid such conditions.

J. It is the intent of this Contract for the water mains to be installed at a minimum of 5’-0” cover. The Contractor shall review the Contract Drawings and perform experimental excavations to avoid conflict with existing utilities. Where required and with approval of the Engineer, the Contractor shall adjust the location and elevation the water main to avoid conflicts. Installation of vertical bends on the new water mains should be avoided, except where approved by the Engineer.

K. Pipe shall not be installed in areas where excavations have been carried below trench grade, or where water conditions create unstable bottoms, until such time as the trench is excavated, refilled and compacted as specified.

3.2 MECHANICAL JOINTS

A. Mechanical Joints shall be installed with all required joint accessories, including gaskets, thrust restraint glands with drilled bolt holes, tee head bolts, and hexagonal nuts.

B. Torque wrenches shall be used to take up such joints. Wrenches shall be equipped with adjusting breakable tension gauge, set to break the tension at the tension loading recommended by the manufacturer. Mechanical joints shall be made so as to secure tight joints, every means being taken to secure this result.

3.3 RESTRAINED JOINTS

A. All joints are to be restrained for a minimum distance as shown in the following table, beyond each side of a fitting or valve, or as otherwise shown on the plans or noted below. All restrained joints shall be assembled in strict accordance with manufacturer's instructions.
C. Restrained lengths listed below are based on a 150 psi test pressure, 5-foot depth of cover, Trench Type 4 and Soil Type SP (Poorly graded sands and gravelly sands, little or no fines). The table below shows the minimum required length of pipe on each side of the fitting or valve that is required based upon sand soil.

<table>
<thead>
<tr>
<th>Nominal Pipe Size - Inches</th>
<th>Offset of bend in degrees</th>
<th>Dead End or Valve (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>90</td>
<td>45</td>
</tr>
<tr>
<td>6</td>
<td>16</td>
<td>7</td>
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<tr>
<td>8</td>
<td>21</td>
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<td>10</td>
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<td>11</td>
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<tr>
<td>12</td>
<td>30</td>
<td>13</td>
</tr>
</tbody>
</table>

3.4 CUTTING OF PIPE

A. Cutting of PVC pipe shall be made with a power saw. Blades shall be as recommended by the manufacturer of the pipe.

B. A square cut is essential to ensure proper assembly and/or beveling. PVC pipe is to be cut with a fine-toothed hacksaw, handsaw or a power type saw with a steel blade or abrasive disc. The use of pipe cutters is not allowed. It is recommended that the pipe be marked around its entire circumference prior to cutting to ensure a square cut. Do not burn the pipe while cutting.

C. When lengths of pipe are field cut to provide for short lengths, the outside of the cut ends shall be tapered back one-eighth (1/8) inch at an angle of thirty (30) degrees with the centerline of the pipe and as recommended by the manufacturer before field cut pieces are used.

3.5 PIPE BLOCKING

A. Furnish and install wood blocking where required. Blocking shall be used as directed by the Engineer.
B. Blocking shall be new spruce plank 2 inches in thickness. Blocks shall be bedded firmly and level across the bottom of the trench and when any block has been sunk too deeply additional blocking of suitable thickness shall be placed to bring the pipe to the required grade.

C. Blocks shall be placed at a point 1/5th of the span from each joint. Each block shall be 2-inch by 4 inch with a length of 4 inches larger than the diameter of the pipe. A sufficient quantity of wedges 12 inches long of 4-inch by 4-inch fir shall be furnished to properly hold valves and special castings in place. A new 4 inch by 4-inch timber shall be used to brace hydrant posts.

3.6 HYDRANT BRANCHES

A. Furnish and install hydrants on hydrant branches where shown the Contract Drawings or as approved by the Engineer.

B. Each hydrant branch shall consist of a valve anchoring tee with 6-inch branch, 6-inch gate valve (mechanical joint), a 6-inch PVC pipe nipple of the required length and thrust restraint glands provided on the joints of all valves, fittings and hydrants. The base of all hydrants, valve anchoring tees and hydrant valves shall be set on concrete pads.

C. Hydrant barrel extensions shall be furnished and installed where necessary to provide a hydrant elevation acceptable to the Engineer.

D. Construct hydrant drainage wells of one-half (1/2) cubic yard capacity of crushed stone placed in the excavated area below and around the hydrant bottom. Furnish and place filter fabric over the stone to minimize migration of fines into the stone.

E. Hydrants shall be given two (2) coats of quality paint after installation as specified previously.

3.7 VALVE BOXES

A. Furnish and install valve boxes over each valve.

B. Valve boxes shall be cut with a wheel cutter, if necessary, to adjust them for height, where approved by the Engineer.

C. Boxes shall be installed vertical position and allow valve key to properly engage the valve operating nut.
D. Valve boxes shall be properly adjusted over the operating nuts of valves and adjusted to the proper height to correspond to the street or ground surface. Operating nuts shall be centered in the valve boxes using a valve centering ring.

3.8 SERVICE CONNECTIONS

A. Prior to excavating for the service connections, cut and stockpile all sod on established lawns, remove shrubs, hedges, fences, trees, and other items that may be required to be removed for construction operations.

B. Equipment with rubber tires shall be used to excavate and backfill within the established lawns.

C. Connect all service lines to the new main as directed by the Owner, the Engineer and as specified herein. Service lines shall be connected after the new main has been tested, disinfected and approved for service and the Work shall result in a minimum disruption of service to the consumer.

D. Make only "wet taps" into the new mains and install tapping saddles, corporation cocks, goosenecks, polyethylene tubing, curb stops, stainless steel inserts, service boxes, tracer wire, fittings, adapters, and make all joints water tight. Service lines shall be installed to the limits and at such locations, as directed by the Engineer. Dry taps may be permitted in extreme conditions and with prior approval by the Engineer.

E. Water mains shall be tapped in accordance with the manufacturer's latest published recommendations (i.e., depth of tap, number of threads exposed, allowable sizes, etc.) and the Contractor shall adhere strictly to these recommendations. The Contractor shall be held responsible for all subsequent leaks or failure of the taps or the water main due to faulty tap installation for one year from the date of final acceptance of the Project and shall make all the necessary repairs that may be required during this period.

F. Drills and taps shall be inspected frequently for signs of wear. The Contractor shall not exceed the number of taps specified by the manufacturer before reconditioning or replacement. Service lines shall be cut only with approved wheel cutters.

G. Services shall be laid to a minimum depth of five feet, zero inches (5'-0") and shall come off the main as close to a 90 degree angle as possible and have a curb stop on the property line unless directed otherwise. The water service line shall be buried in an envelope of sand and have no sharp objects within twelve (12) inches.
H. Furnish and install all necessary adapters, couplings, and all other water service materials required to make the connections between the new service pipe installed under this Contract and the house side of the curb stops. The limit of Work related to service connections shall be a complete connection of the new curb stop and box to the house service.

I. The Contractor shall take all precautions to avoid migration of silts into the service line which may clog the water meter. The following steps shall be taken, as a minimum, to avoid potential issues:

1. There shall be no standing water in the trench;
2. Service pipe shall have temporary plugs at each ends at all time;
3. Service line shall be connected to the new corporation cock and flushed clean before connecting to the new curb stop and existing house service;
4. Open an exterior faucet to flush the new service line;
5. Open the corporation cock and curb stop very slowly to avoid resuspension of particulate matter within the existing house service line; and
6. Run the exterior faucet for five (5) minutes until such time that the line is void of air and any discolored water.

J. Failure to take precautionary measures will result in water meters being plugged. This will require the Owner to repair or replace the impacted water meters. The Owner reserve the right to charge the Contractor for all costs associated with labor and materials to repair or replace the water meter.

K. All water service lines shall be buried in an envelope of 12-inches of sand from the corporation cock to curb stop.

L. Water services shall be installed in such a manner as not to cross other utilities and have a minimum of ten (10) feet between utilities, if possible.

M. Tracer wire for water services shall be installed from the corporation cock along the service lines to the curb stop per the detail on the Contract Drawing entitled “Typical House Service Detail”. The Contractor shall wind tracer wire 3 times around corporation cock, curb stop and curb box up to top of curb box cover.

N. It is the intent of this Project that all new curb stops and service boxes to be installed on the property line. Any existing service boxes located more than 5 feet into private properties shall be removed and the holes to be filled and area restored to original conditions.

O. Replace or replant sods, shrubs, hedges, trees, gardens, and reinstall fences to preconstruction conditions.
3.9 ABANDONED VALVE BOXES

A. Upon completion of all Work and successful testing and disinfection of the new mains, the Contractor shall, with the assistance of Water Division personnel, close all existing valves on mains which have been cut and capped and/or are no longer in service.

B. After closure, each valve box top section shall be removed, the void filled with gravel prior to repaving.

3.10 REMOVING AND STACKING EXISTING HYDRANTS

A. After new services and hydrants have been installed, remove existing hydrants and stack them at a location selected by the Owner. The Contractor at no additional cost to the Owner shall legally dispose of any hydrant that the Owner decides not to accept. Prior to removing any existing hydrants, the Contractor shall notify the Fire Department and coordinate this Work.

B. For each hydrant to be removed and stacked, the Contractor shall close existing branch valve, cut and remove existing branch, remove the gate box, and remove the hydrant. All removed materials which the Owner decides not to accept shall be legally disposed of by the Contractor at no additional cost.

3.11 COORDINATION FOR WATER SHUT DOWN

A. It is the intent of this Contract for the water services to remain uninterrupted throughout this Project. Any water service disruption shall be fully coordinated with at least seven (7) days advanced notice and shall be limited to a maximum of six (6) hours, unless otherwise approved by the Engineer.

B. The Contractor shall submit a sequence of construction for the Project. The plan shall include the procedure and schedule for making connections to existing water mains. The connections to the existing water mains shall be planned to minimize water service and traffic flow interruptions. The plan shall be submitted for review and approval.

3.12 TEMPORARY BLOWOFFS

A. Temporary blowoffs shall be furnished and installed where necessary to facilitate testing and disinfection and where directed by the Engineer.
3.13 BURIED UTILITY WARNING AND IDENTIFICATION TAPE

A. Place buried utility warning and identification tape over all PVC pipelines and polyethylene service pipes.

3.14 OTHER MATERIALS

A. Furnish and install all necessary materials required for a complete installation.

END OF SECTION 02600
SECTION 02647
CONNECTING TOEXISTING WATER MAINS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This section includes the following:

1. Connecting to existing mains.

B. Related sections include the following:

1. Section 02210 – Earth Excavation, Backfill, Fill and Grading

2. Section 02600 – Water Main and Appurtenances

1.3 SUBMITTALS

A. Shop Drawings: Submit the following in accordance with Section 01300 – SUBMITTAL PROCEDURES.

1. Submit shop drawings and manufacturer literature for sleeves, valves, couplings and piping to be used in connecting to existing mains.

PART 2 - PRODUCTS

2.1 COUPLINGS - SLEEVES

A. Couplings and sleeves shall be as specified in Section 02600.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions: The Contractor shall verify field conditions by test pits or other methods prior to construction.
3.2 INSTALLATION

A. The Contractor shall make all connections to the existing mains as indicated in the Contract Documents.

B. The Contractor shall develop a program for the construction and putting into service of the new work subject to the approval of the Engineer. All work involving cutting into and connecting to the existing water mains shall be planned so as to interfere with operation of the existing facilities for the shortest possible time.

C. The Contractor shall have all preparatory work done prior to making the connection and shall provide all labor, tools, material, and equipment required to do the work in one continuous operation.

D. The Contractor shall have no claim for additional compensation, by reason of delay or inconvenience, for adapting his operations to the requirements of the Owner.

E. Under no circumstances shall any customer be without water for a period of more than 4 hours without prior written approval of the Owner.

F. The Owner does not guarantee a tight shut-off for existing local community water valves. No damages shall be claimed by the Contractor for delays in dewatering pipelines nor shall any damages be claimed because of water leaking through closed valves after dewatering is completed. It shall be the responsibility of the Contractor to provide the means to dewater the excavation if required when making connections.

G. The Contractor shall be responsible for the following restrictions on shutdown of water mains:

1. Valves to be operated only by the Water Department personnel.

2. 24 hour advance notice for shutdown requests shall be given to the Water Department’s Representative and Superintendent.

3.3 APPLICATION:

A. Cut-ins:

1. Cut-ins to existing mains shall be performed after approved disinfection and pressure test results have been obtained for the new mains.
2. Cut-ins shall be accomplished with fittings or, if possible, pipe deflection.

3. Attachment to existing mains shall be accomplished with restrained mechanical joints, long body solid sleeve.

3.4 CLEANING

A. Contractor shall clean the existing main with wire brush and wash the pipe surface and the tapping sleeve and valve interior with 5% hypochlorite (bleach) solution.

3.5 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01700.

END OF SECTION 02647
SECTION 02675
DISINFECTION OF WATER MAINS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings and general provisions of the Contract, and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY
   A. This section includes the following:
      1. Disinfection of pipelines.
   B. Related sections include the following:
      1. Section 02600 - PVC Pipe and Fittings.
      2. Section 02704 - Pipeline Pressure and Leakage Testing.

1.3 SYSTEM DESCRIPTION
   A. Disinfect all water main and appurtenances installed under this contract. Disinfection shall occur after successful pressure and leakage testing as specified in Section 02704 has been conducted.
   B. The location of main line and appurtenances are shown on the Drawings.
   C. Pipeline disinfection shall be performed in conjunction with the related work items of dewatering, testing, and discharge of chlorinated water, prior to placing newly installed water main in service. The Contractor's responsibility shall include, but not be limited to the following:
      1. Provision of the chlorine product for disinfection at the rate and dose specified shall be in accordance with AWWA standards.
      2. Provision of pipeline taps for dosing and testing of chlorinated water, as necessary.
      3. Furnishing, installation and removal of bulkheads required for testing.
4. Labor and equipment necessary to dispense the dose chlorine at points and rates as directed by the Engineer.

5. Labor and equipment to operate newly installed mainline valves, air release valves, and blowoff valves as necessary and directed by the Engineer.

6. Labor and equipment to dechlorinate the treated water prior to discharge.

D. The Contractor shall be responsible for disinfecting and putting into service new water mains which shall become the property of the Owner.

E. Contractor shall be responsible for coordinating all activities with the Owner.

1.4 SUBMITTALS

A. Shop Drawings: Submit the following in accordance with Section 01300 – SUBMITTALS:

1. One week prior to initiating disinfection work, the Contractor shall submit to the Engineer a written workplan describing fully his proposed work. The workplan shall include, but not be limited to, the following:

   a. List of main segments by valve or station locations.
   b. Description of the pipe diameter and lengths to be tested.
   c. Full description of method to be used (slug or continuous feed) in disinfecting the mains.
   d. Chlorine agent to be utilized.
   e. Chlorine material safety data sheets.
   f. Chlorine batching calculations to show required level of chlorine being added to the mains.
   g. Flushing methods listing pipe diameter, length, flushing time calculations and location of flushing outlets.
   h. Methods of measuring chlorine solution being added to the pipe and after it has been added.
   i. Sample collection techniques.
   j. Names of personnel who will be conducting the disinfecting and sampling.
   k. Name of laboratory proposed to perform the tests.
   l. Dechlorination methods, including dechlorination agent and locations.
   m. Backflow preventor data (model, size).

2. Engineer shall review the Contractor’s workplan. Workplan shall be revised and resubmitted as required by the Engineer.
3. No disinfection work shall commence until Engineer approves the workplan.

1.5 QUALITY ASSURANCE

A. Provide in accordance with Section 01400.

1.6 PROJECT/SITE CONDITIONS

A. Contractor shall utilize water from the active water mains to perform disinfection work as specified.

B. All water shall be discharged in accordance with local, state and federal regulations.

1.7 SEQUENCING AND SCHEDULING

A. Coordinate operation of existing valves, timing and duration of shut-down of existing mains, and disinfecting, and re-energizing of the water main with the Engineer and where applicable with the Owner including notification of the following prior to the stated work:

1. Valve Operations: Notify Engineer one (1) working day prior to stated work.

2. Disinfecting: Notify Engineer three (3) working days prior to stated work.

3. Notification shall include location of work, length and diameter of the pipe to be disinfected and other pertinent information.

4. Contractor shall allow at least 24 hours for Town approval to activate water mains after passing disinfection testing results are submitted.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Calcium hypochlorite shall conform to AWWA B300.

1. Granules with 70 percent available chlorine.

B. Liquid sodium hypochlorite shall conform to AWWA B300.

C. Backflow preventer devices (reduced pressure devices), model to be State approved.
D. Line purge dechlorinator with dechlorination tablets or other method acceptable to the Engineer. Dechlorinator shall have 2-1/2 inch NPT coupling and capacity flow rates of up to 1,600 GPM. Dechlorination tablets shall be ascorbic acid, sodium sulfite or sodium thiosulfate, capable of dechlorinating the flushed water. Dechlorinator shall be H₂O Neutralizer as manufactured by Measurement Technologies, Inc., Redmond, WA (860-651-3368), Model LPD-250 as manufactured by Pollard Water, New Hyde Park, NY.

E. Chlorine residual analyzer.

PART 3 - EXECUTION

3.1 PREPARATION

A. General:

1. Perform disinfection in accordance with AWWA C651.

2. The Engineer will review disinfection procedure, designate dosage and will perform necessary water quality tests to verify that disinfection has been accomplished according to public health standards.

B. Flushing:

1. If water of sufficient quantity and pressure is available, flushing as specified here and after should be performed:

Prior to chlorination, mains shall be properly flushed by the Contractor. In general, flushing shall be performed at a flow rate required to achieve a minimum velocity of 2.5 feet per second (approximately 900 GPM in a 12-inch main, 400 GPM in an 8-inch main, 220 GPM in a 6-inch main, and 30 GPM in a 2-inch main). Flushing shall be performed for a sufficient period of time to allow for a minimum of 3 volume changes of water in the main (approximately 20 minutes per 1000-foot of main at the above flow rates).

C. Discharge:

1. Following disinfection, water with concentrations of chlorine shall be dechlorinated and discharged to the atmosphere.

   a. The Contractor shall notify the Engineer and Owner of the specific location where chlorinated water will be discharged at least three (3) days in advance of proposed discharge.
2. Water with high concentrations of chlorine (residual greater than 2 mg/l) shall be dechlorinated to a level of 2 PPM or less prior to its discharge. Dechlorination shall be conducted by use of a line purge dechlorinator or other method acceptable to the Engineer. Dechlorination shall be in accordance with the manufacturer’s instructions and AWWA C651, Section 4.5.

3.2 INSTALLATION

A. Calcium Hypochlorite:

1. Use only as a solution.

2. Pump into pipe with a suitable chemical feed pump.

3.3 APPLICATION

A. Special Techniques:

1. Disinfect pipes by the continuous feed.

   a. Continuous feed method:

   1) Operate all appurtenances to ensure that all hydrants, gate valves, and sample taps have been disinfected. Manipulate valves to prevent super chlorinated water from entering existing distribution system.

   2) The Town will operate all valves in the system. Contractor shall coordinate with Owner a minimum of 24 hours in advance to arrange for Town personnel to operate valves.

   3) Perform pressure and leakage testing in accordance with specification 02704.

   4) Feed chlorine into pipe so water entering contains 25 mg/l of available chlorine.

   5) Apply chlorine continuously until entire pipe is filled with chlorine solution. All chlorination ports must be open before system gates are operated to ensure one way flow.

   6) Retain treated water in pipe for at least 24 hours.

   7) Ensure that chlorine residual at end of test is at least 10 mg/l.

   8) Coordinate a third party testing agency to collect samples as specified.

   9) Provide all laboratory results and chain of custody documentation to Owner and Engineer under a submittal cover when results are available. Contractor shall not activate mains until final approval is received.
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DISINFECTION OF WATER MAINS

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from the Town. Allow for 24 hours for approval.

10) All corporations used for disinfection purposes shall
be closed and plugged after disinfection is complete.
All tubing shall be removed.

11) Activate water main

2. Ensure that appurtenances are fully disinfected.

3.4 FIELD QUALITY CONTROL

A. Tests:

1. Measure chlorine levels with meters or color-wheel. Paper pool strips
are not acceptable methods for determining chlorine levels.

2. Bacteriological test samples shall be collected by the Contractor after
the chlorine solution has been flushed out of the pipe.

3. Disinfection shall be repeated, as necessary, to produce satisfactory
bacteriological samples.

4. Twenty-four (24) hours after the main has been fully dechlorinated and
flushed, bacteriological samples shall be taken. Water samples shall be
taken from corporation stops along the length of the water main as
designated by the Engineer. Samples shall be collected every 1,200 ft
of new or rehabilitated water main, plus one set from each end of the
line and at least one from each branch greater than one pipe length,
each in duplicate, in sterile bottles and furnished to the Engineer or
Owner for delivery to a State approved laboratory for analyses.
Duplicate samples, shall be collected a minimum of 15 minutes after
the original while the sampling taps are left running. The Contractor
shall be responsible for all necessary work including delivery of
samples to a certified laboratory and shall include the cost for sampling
and analysis in his bid price.

5. The results of the tests on these samples will determine the acceptance
of the work and allow these new mains to be connected to the Owner’s
system. The failure of any sample to pass the laboratory tests shall
require the Contractor to re-flush and rechlorinate the mains and re-
sample and test the water until acceptable results are obtained, all at no
additional cost to the Owner.

B. Activation:

1. Upon receipt of satisfactory bacteria sample test results and
successful pressure tests, Contractor shall notify Engineer. Copies of
all test reports shall be given to the Engineer and Owner. Contractor
shall not activate main until authorization from the owner is received.
2. Contractor shall note that work under this Contract shall not be considered completed until satisfactory installation and testing of the water mains have been completed.

3. All corporations installed for disinfection purposes shall be closed and plugged. All tubing shall be removed.

3.5 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01701.

END OF SECTION 02675
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes furnishing all labor, materials, equipment and appurtenant work to satisfactorily maintain water service to customers connected to pipelines which may be disturbed or taken out of service during the work of this contract.

B. Temporary piping used for fire protection shall be a minimum of 6-inch diameter. Pipe for potable water shall be a minimum of 2-inch diameter.

C. Related Sections include the following:

1. Section 02600 – Water Main and Appurtenances
2. Section 02675 – Disinfection of Water Mains
3. Section 02704 – Pipeline Pressure and Leakage Testing
4. Section 02711 – Cleaning and Cement Mortar Lining

1.3 SUBMITTALS

A. Submit the following in accordance with Section 01300 – SUBMITTALS:

1. Submit to the Engineer, the Owner and the local Fire Department for review, prior to providing temporary service, a complete by-pass piping layout including specific by-pass pipe diameter to be used in specific locations and types of temporary fire hydrants.

2. Submit to the Engineer for review Shop Drawings detailing pipe, hose and temporary fire hydrants to be furnished and utilized for use in conjunction with the temporary by-pass pipe and connections to services and laterals.

3. Submit to the Engineer for review, descriptive literature detailing disinfection procedures relating to the by-pass piping prior to its use.

4. Materials used for wetted surface metals in contact with potable water shall be lead free with lead level not exceeding 0.25%. Materials shall
comply with the 2014 Safe Drinking Water Act Lead Reduction law and comply with NSF 372. Submit certification that all pipe, valves and fittings are in full compliance with latest EPA lead free requirements.

1.4 QUALITY ASSURANCE

A. Provide in accordance with Section 01400 and as specified.

B. The Contractor designing and installing the bypass flow handling system shall have completed at least five (5) projects of similar size and complexity as this project in the United States within the past three (3) years. Contractor may employ the services of a subcontractor that specializes in this work to fulfill this requirement.

C. Rejection of any subcontractor and/or manufacturer by the Engineer due to insufficient qualifications shall not be grounds for modifications to the Contract Documents such as change in scope, time of completion or contract amount.

1.5 DELIVERY, STORAGE AND HANDLING

A. Provide in accordance with Section 01610.

PART 2 - PRODUCTS

2.1 PIPE AND MATERIALS

A. Piping and materials to be used by the Contractor shall be PVC, HDPE, or steel and have been previously reviewed by the Engineer and shall be fully adequate to withstand the distribution system pressures in the vicinity of project.

B. All by-pass piping connected to fire hydrants must be provided with a tee, valve, and hydrant quick connect, for each hose connection so as to maintain sufficient fire protection during the course of the work.

C. All temporary piping, valves and appurtenances shall be “lead free”. Materials used for wetted surface metals in contact with potable water shall be lead free with lead level not exceeding 0.25%. Materials shall comply with the 2014 Safe Drinking Water Act Lead Reduction law and comply with NSF 372.

2.2 PRESSURE REDUCING VALVES

A. Bypass connections to fire hydrants on the high service system, as indicated on the Drawings, shall have pressure reducing valves on the potable water piping to reduce system pressure prior to service connections to customers on the low service system. The Owner to provide high service system pressure and low service system pressure.


2. Globe or Angle-pattern, as indicated, 125-lb. ANSI flanges.
3. **Materials:**  

4. Valve to be hydraulically operated, pilot controlled, single acting, single seat design.

5. Valve shall be either diaphragm or piston-operated.

6. Throttling shall be accomplished by V-ports.

7. Valve seats and discs shall be replaceable.

8. Valve stem and disc movement shall be guided through its entire travel.

9. Pilot piping shall be supplied with strainer and isolation cocks. Pilot valve shall modulate to position the diaphragm or piston to maintain an established downstream pressure.

**PART 3 – EXECUTION**

**3.1 TEMPORARY WATER SERVICE MAINTENANCE**

**A.** All Pipe and fittings shall be watertight and shall be disinfected prior to being put into service. Disinfection and testing shall be performed by the Contractor and shall comply with Sections 02675 and 02704 of the specifications.

**B.** Temporary by-pass facilities shall include hoses and necessary outlets and fittings to each service connection. The Contractor shall furnish, install, and maintain the temporary lines in a safe and operative condition at all times. After service has been restored to a section of water main, the Contractor shall remove the temporary by-pass and related facilities and shall leave the work site in its original condition.

**C.** Temporary piping shall be installed adjacent to the roadways where it will cause the least obstruction and where it will be least susceptible to damage. At street intersections or access ways, the pipe shall be installed in a shallow trench to be overlaid with temporary bituminous pavement. At driveways, pipe crossings shall be provided utilizing cold patch cover or other method acceptable to the Engineer.

**D.** Contractor to provide 24-hour emergency service personnel to fix and repair any damage to temporary by-pass piping. Contractor to furnish Owner with name and telephone number of person assigned to emergency repair service. Said person shall be capable of arriving at site within 1-hour of notification and providing necessary tools, equipment, and labor to repair damaged by-pass line. If emergency personnel fail to arrive, Owner’s forces shall be authorized to take corrective actions, and all costs for labor, materials and equipment shall be backcharged to the Contractor. Minimum charge for Owner’s forces shall be two (2) men at 4 hours minimum, overtime rate, plus materials, equipment costs, and cost of estimated water loss. All backcharges shall be deducted from payments due the Contractor for work performed under this contract.
E. Where water for temporary servicing is taken from the high service system, the Contractor shall provide pressure reducing valves to reduce the pressure of potable water service to the low service system. Owner to provide system pressures.

F. Water for temporary servicing shall be taken from the nearest available fire hydrant, or as directed by the Engineer and the Owner. If hydrants are unavailable, below ground taps for by-pass connection will be installed by the Contractor under the supervision of the Engineer and the Owner.

G. All dwellings, whether occupied at the time of the project or not, shall be provided with temporary water service. Prior to activating the service, the Contractor shall disinfect and flush the piping. The Engineer shall review the temporary piping system prior to placing in service.

H. Prior to installing and activating the temporary service, the Contractor shall notify the Engineer and the Owner in advance to allow the Owner to notify all customers accordingly.

I. The use of bleeder hoses is prohibited without the consent of the Owner. If the Owner permits the use of bleeder hoses, the Contractor is required to report dates and durations of usage of bleeder hoses to the Owner for review.

J. The Contractor shall operate all valves with an Owner's representative present. All necessary safety precautions, including traffic cones and highway safety barriers, shall be provided by the Contractor while operating valves in roadways.

K. When replacing defective sideline valves, temporary by-pass piping shall not be used for the sole purpose of feeding customers affected by the temporary shutdown of service. The shutdown shall be coordinated with the Owner and the defective valve shall be replaced.

L. Temporary fire hydrants shall be furnished, installed and maintained by the Contractor and shall be placed adjacent to existing hydrants while they are out of service procedures. Temporary hydrants shall be maintained by the Contractor until the existing hydrants are restored to service.

M. Restoration of service to the customer, including disconnection from the by-pass system and reconnection to the new pipeline, is the Contractor's responsibility and shall be performed at his expense.

N. Contractor shall be responsible for restoring adjacent properties to original condition. All paved roadways, access ways and driveways shall be repaired and repaved to original condition.

3.3 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01701.

PART 4 – COMPENSATION (Not Used)

END OF SECTION 02685
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This section includes the following:

1. Perform field hydrostatic pressure and leakage testing of pipes.

B. Related section includes the following:

1. Section 02615 - Ductile Iron Pipe and Fittings

1.3 DEFINITIONS

A. Leakage - Leakage is defined as total amount of water introduced into pipe during leakage test to maintain test pressure.

1.4 SYSTEM DESCRIPTION

A. Pipe installed under Section 02600 shall be tested in accordance with the requirements of this section.

1.5 SUBMITTALS

A. Shop Drawings: Submit the following in accordance with Section 01300 - SUBMITTALS:

1. Testing schedule and test procedure.

a. Indicate proposed time and sequence of testing on schedule.

b. Indicated test procedure requirements as follows:

(1) Limits of each pipe tested.

(2) Position of all valves during testing.
(3) Location of temporary bulkheads.

(4) Other applicable procedures.

(5) Equipment to be utilized.

1.6 SEQUENCING AND SCHEDULING

A. Complete pressure and leakage testing of pipes prior to final cleaning and disinfection; Engineer shall be present during all testing.

1. Notify Engineer of time and place of testing at least 3 days prior to commencement of work.

PART 2 - PRODUCTS

2.1 EQUIPMENT

A. Provide test equipment as follows:

1. Piping connections between pipe tested and water source.

2. Equipment, materials, and facilities required to perform specified tests including but not limited to the following:
   a. Pumping equipment
   b. Calibrated barrel
   c. Pressure gauges

3. Sectionalizing devices required including but not limited to the following:
   a. Flanges
   b. Valves
   c. Bulkheads
   d. Bracing
   e. Blocking
PART 3 - EXECUTION

3.1 PREPARATION

A. Provide blocks, anchors, and supports for pipe before test pressure is applied.

3.2 INSTALLATION

A. Water:

1. Schedule filling of line through Engineer at least three (3) days in advance of testing.

2. Do not allow water to enter other parts of the pipeline, not subject to testing, unless approved by the Engineer.

3. Dispose of test water in a manner approved by the Engineer.

B. Venting:

1. Ensure that air release valves and other venting devices are properly installed and placed in open position when filling pipe with water.

2. Do not close hand-operated vent valves until water flows in an uninterrupted stream from each valve.

3.3 APPLICATION

A. Pressure Testing:

1. All pipe and appurtenances installed shall be hydrostatically tested in accordance with ANSI/AWWA C600, latest version unless stated otherwise herein.

   a. Test pressure, expressed in terms of feet of water, applied at any point in pipe equals arithmetic difference between specified test pressure plane elevation and elevation of horizontal center line of pipe at selected location.

   b. Multiply value by 0.433 to obtain pounds per square inch.

   c. Ensure pressure gauges are accurately calibrated.

   d. Do not attempt pressure testing until all air has been vented from the mains.
2. All new water mains which shall become the property of the Owner shall be pressure tested at 150 psi for a continuous period of two hours.

B. Leakage Testing:

1. Conduct leakage testing in conjunction with pressure tests.

2. Ensure that joints in piping are watertight and free from visible leaks during leakage test.

3. Leakage Test Pressure:
   a. Maintain specified normal operating line pressure for pressure testing of reach during leakage test.
   b. Maintain hydrostatic pressure within plus or minus 5 percent during entire time of leakage measurements.

4. Leakage Measurement:
   a. Do not attempt measurement of leakage until trapped air has been vented and constant test pressure has been established.
   b. Measure leakage by means of an approved calibrated barrel installed in the pressure piping on discharge of the pump.

      (1) Ensure that barrel is accurately calibrated.

5. Allowable Leakage:
   a. Ensure that pipe reach does not exceed the allowable leakage rate.
   b. Calculate allowable leakage with following formula:

      \[
      Q = 0.0075 \times DLN
      \]

      \[
      Q = \text{allowable leakage in gallons per hour}
      \]

      \[
      D = \text{nominal diameter of pipe in inches}
      \]

      \[
      L = \text{length of section tested in thousand feet (1000-foot maximum)}
      \]

      \[
      N = \text{square root of avg test pressure in psi (14.14 for 200 psi)}
      \]

   c. Calculate allowable leakage separately for each diameter and add resulting allowable leakage rates to obtain total allowable leakage for entire reach.
3.4 FIELD QUALITY CONTROL

A. Inspection:

1. Locate defective joints and pipe materials during pressure testing.

2. Locate and repair leaking joints and other defective items of work to reduce pipe leakage to an amount acceptable to Engineer, or where applicable, the Owner’s requirements.

3.5 CONTRACT CLOSEOUT

A. Provide in accordance with Section 01701.

END OF SECTION 02704
APPENDIX A

MASSACHUSETTS PREVAILING WAGE RATES
To be provided through Addenda
APPENDIX B

ORDER OF CONDITIONS
To be provided through Addenda