

INVITATION FOR BID (IFB)

# MORNINGSIDE DRIVE CULVERT REPLACEMENT PROJECT



TOWN OF LONGMEADOW  
MASSACHUSETTS



August 8, 2019





**Morningside Drive Culvert Replacement Project  
Town of Longmeadow DPW  
Longmeadow, Massachusetts**

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INVITATION FOR BIDS (IFB)  
MORNINGSIDE DRIVE CULVERT REPLACEMENT PROJECT

The Town of Longmeadow is soliciting bids for the Morningside Drive Culvert Replacement Project. The bid package is available from the Longmeadow Purchasing Department, Attn: Chad Thompson, Procurement Manager, 735 Longmeadow Street, Suite 101, Longmeadow, MA 01106, Phone: 413-565-4185, email: [cthompson@longmeadow.org](mailto:cthompson@longmeadow.org). Sealed bids shall be delivered to the Purchasing Department with the label "IFB: Morningside Drive Culvert Replacement Project" followed by the complete contact information of the bidder. Bids will be received until the bid deadline of **Thursday, August 22, 2019, at 11:00 AM**. Late bids will be rejected. A public bid opening will immediately follow in the auditorium.

The work consists of: replacement of approximately 150 linear feet (LF) of existing 24-inch CMP culvert with 60-inch polypropylene culvert, replacement of approximately 50 LF of existing 12-inch CPP drain with 18-inch polypropylene drain pipe, replacement of approximately 60 LF of existing 12-inch CPP drain with 12-inch polypropylene drain pipe, and replacement of 2 catch basins and installation of 1 new drain structure with manhole riser; temporary water system installation and replacement of approximately 120 LF of existing 8-inch asbestos cement (AC) water main with 8-inch ductile iron water main and replacement of 1 hydrant; replacement of approximately 100 LF of existing 8-inch AC gravity sewer with 8-inch PVC sewer and replacement of 1 sewer manhole riser section; installation of temporary gas line and replacement of approximately 120 LF of existing gas main (by the utility company); site and paving restoration, grading and slope stabilization. Additive Alternate No. 1 includes the replacement of two catch basin top slab/inlet structures. Additive Alternate No. 2 includes the chemical sealing and cementitious lining of one sanitary sewer manhole. Time for completion shall be as specified in Section 00520 (Agreement). The Town intends for utility work and paving repair to be completed prior to a Winter 2019 shutdown, with final milling and overlay paving to be completed in Spring 2020.

Bid documents are available from the Longmeadow Purchasing Department at no charge. Bid documents may also be downloaded online at the town website [www.longmeadow.org](http://www.longmeadow.org) through the Purchasing Department page, and then select the link labeled 'Bids & RFPs', then select the link labeled 'Bid & RFP Finder' to access bid documents. Bidders that access bid documents online are encouraged to register with the Purchasing Department to receive updates. Others are required to monitor bid postings linked to the Purchasing Department page prior to the bid deadline for additional information and issued addenda. Failure to acknowledge Addenda may result in a bid rejection.

A bid deposit in the amount of five percent (5%) shall be included with the bid submission. Bid deposits shall be made payable to the "Town of Longmeadow" in the form of a bid bond, certified check, treasurer's check or cashier's check issued by a responsible bank or trust company. Performance and payment bonds in the full amount of the contract will be required upon Contract Award. All bids shall comply with minimum wage rates as set forth under Massachusetts General Law Chapter 149, Sections 26 to 27H.

All bids for this project are subject to the provisions of Massachusetts General Laws Chapter 30, Section 39M as amended.



No Bid may be withdrawn within thirty (30) days after the date of the opening of bids.

The Town of Longmeadow, acting through the Town Manager, the Awarding Authority, reserves the right to reject any or all bids, waive minor informalities, and to award the contract in the best interest of the Town.

END OF SECTION

## SECTION 00200

### INSTRUCTIONS TO BIDDERS

#### TABLE OF ARTICLES

1. Defined Terms
2. Copies of Bidding Documents
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23. Sales Taxes
24. Massachusetts Wage Rates
25. Massachusetts Requirements

#### ARTICLE 1 DEFINED TERMS

- 1.1 Terms used in these Instructions to Bidders will have the meanings indicated in the General Conditions and Supplementary Conditions.

#### ARTICLE 2 COPIES OF BIDDING DOCUMENTS

- 2.1 Refer to Invitation for Bids for information on examination and procurement of documents.
- 2.2 Complete sets of Bidding Documents shall be used in preparing Bids; neither Owner nor Engineer assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

- 2.3 Owner and Engineer in making copies of Bidding Documents available on the above terms do so only for the purpose of obtaining Bids for the Work and do not confer a license or grant for any other use.

### ARTICLE 3 QUALIFICATIONS OF BIDDERS

- 3.1 Bidders shall be experienced in the kind of Work to be performed, shall have the necessary equipment, and shall possess sufficient capital to properly execute the Work within the time allowed. Bids received from Bidders who have previously failed to complete Work within the time required, or who have previously performed similar Work in an unsatisfactory manner, may be rejected. A Bid may be rejected if Bidder cannot show that he has the necessary ability, plant and equipment to commence the Work at the time prescribed and thereafter to prosecute and complete the Work at the rate or within the time specified. A Bid may be rejected if Bidder is already obligated for the performance of other Work which would delay the commencement, prosecution or completion of the Work.
- 3.2 Bidders shall have a minimum of 5 years experience and shall have successfully completed 3 culvert replacement projects of similar. Submit the following information with the bid:
- A. Summary of experience and representative projects to show compliance with the requirements listed above.
  - B. No award will be made to any Bidder who cannot meet all of the following requirements. Bidder:
    - 1. Shall not have defaulted on any contract within three years prior to the bid date.
    - 2. Shall maintain a permanent place of business.
    - 3. Shall have adequate personnel and equipment to perform the work expeditiously.
    - 4. Shall have suitable financial status to meet obligations incident to the work.
    - 5. Shall have appropriate technical experience satisfactory to Owner in the class of work involved.
    - 6. Shall be registered with the Secretary of State of the Commonwealth of Massachusetts to do business in Massachusetts.
    - 7. Shall not have failed to perform satisfactorily on contracts of a similar nature.
    - 8. Shall not have failed to complete previous contracts on time.



- 3.3 Bidders may be investigated by Owner to determine if they are qualified to perform the Work. All Bidders shall be prepared to submit within five days of Owner's or Engineer's request, written evidence of such information and data necessary to make this determination. The investigation of a Bidder will seek to determine whether the organization is adequate in size, is authorized to do business in the jurisdiction where the project is located, has had previous experience and whether available equipment and financial resources are adequate to assure Owner that the Work will be completed in accordance with the terms of the Agreement. Owner reserves the right to reject any Bid if the evidence submitted by, or investigation of such Bidder fails to satisfy Owner that such Bidder is properly qualified to carry out the obligations of the Contract and to complete the Work contemplated therein.

#### ARTICLE 4 EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

- 4.1 It is the responsibility of each Bidder before submitting a Bid to:
- A. examine and carefully study the Bidding Documents, including any Addenda and the other related data identified in the Bidding Documents. Bidders that obtain bid documents online are encouraged to register with the Longmeadow Purchasing Department to receive updates and Addenda. Unregistered bidders are required to check for updates and addenda at [www.longmeadow.org](http://www.longmeadow.org) under the 'Purchasing Department' page of the website as instruction in the Legal Notice, Bid Section 00100. All addenda will be posted no later than two days prior to the bid deadline;
  - B. visit the Site, become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;
  - C. become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, or performance of the Work;
  - D. consider the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on 1) the cost, progress, and performance of the Work; 2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and 3) Bidder's safety precautions and programs;
  - E. agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times and in accordance with the other terms and conditions of the Bidding Documents;
  - F. become aware of the general nature of the Work to be performed by Owner and others at the site that relates to the Work as indicated in the Bidding Documents;

- G. promptly give Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by Engineer is acceptable to Bidder; and
  - H. determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.
- 4.2 On request, Owner will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.
- 4.3 Reference is made to Article 7 of the Supplementary Conditions for the identification of the general nature of other Work that is to be performed at the Site by Owner or others (such as utilities and other prime contractors) that relates to the Work for which a Bid is to be submitted. On request, Owner will provide to each Bidder for examination access to or copies of Contract Documents (other than portions thereof related to price) for such other Work.
- 4.4 Underground Facilities
- A. Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the site is based upon information and data furnished to Owner and Engineer by owners of such Underground Facilities, including Owner, or others.
- 4.5 Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated conditions appear in paragraphs 4.02, 4.03, and 4.04 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work appear in paragraph 4.06 of the General Conditions.

- 4.6 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given Engineer written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by Engineer are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and finishing the Work.

#### ARTICLE 5 PRE-BID CONFERENCE

- 5.1 There will not be a pre-bid conference for this Project.

#### ARTICLE 6 SITE AND OTHER AREAS

- 6.1 The Site is identified in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by Contractor. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by Owner unless otherwise provided in the Bidding Documents.

#### ARTICLE 7 INTERPRETATIONS AND ADDENDA

- 7.1 All questions about the meaning or intent of the Bidding Documents shall be submitted in writing to the Town of Longmeadow Purchasing Department, Attn: Chad Thompson- Procurement Manager, 735 Longmeadow Street, Suite 101, Longmeadow, MA 01106, fax: 413-565-4370, email: [cthompson@longmeadow.org](mailto:cthompson@longmeadow.org). In order to receive consideration. Questions must be received by the Purchasing Department no less than 96 hours (4 days) prior to the date fixed for the opening of Bids. Interpretations or clarifications considered necessary by the OWNER in response to such questions will be issued by Addenda distributed to all parties recorded by the Purchasing Department as having received the Bidding Documents. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 7.2 Addenda may be issued to clarify, correct or change the Bidding Documents. Such Addenda, if any, will be issued in the manner and within the time period stated in paragraph 6.1. Addenda will be posted online through the Purchasing Department page of the town website [www.longmeadow.org](http://www.longmeadow.org). Reference the instructions located in bid section 00100 on how to access bid documents online to obtain them. Addenda will be posted no less than 2 days prior to the bid deadline. Bid document plan holders that do not register with the Longmeadow Purchasing Department are responsible for checking online for issued addenda.
- 7.3 Addenda may be issued to clarify, correct or change the Bidding Documents. Such Addenda, if any, will be issued in the manner and within the time period stated in paragraph 7.1.
- 7.4 The Bidder must acknowledge receipt of each Addendum, if any, in the space provided on the Bid Form.

## ARTICLE 8 BID DEPOSIT

- 8.1 Bids must be accompanied by Bid deposit in an amount of 5% of the Bidder's maximum Bid price and in the form of cash, a certified check, treasurer's check or cashier's check issued by a responsible bank or trust company or a bid bond payable to Owner.
- 8.2 All Bid deposits of General Bidders, except those under consideration by Owner, will be returned within 5 days, excluding Saturdays, Sundays and legal holidays, after the opening of General Bids. Other Bid deposits will be returned upon the execution and delivery of the Agreement. The Bid deposit of the Successful Bidder will be retained until such bidder has furnished the required contract security and executed the Agreement, whereupon the bid deposit shall be returned. If the Successful Bidder fails to furnish the required contract security within 15 days after the Notice of Award and execute the Agreement within 5 days after receipt from Owner, Owner may annul the Notice of Award and the Bid deposit of that Bidder will be forfeited to Owner as liquidated damages for such failure.

## ARTICLE 9 CONTRACT TIME

- 9.1 The number of days within which, or the dates by which, the Work is to be:
- A. substantially completed, and/or;
  - B. completed and ready for final payment;
- are set forth in the Agreement.

## ARTICLE 10 LIQUIDATED DAMAGES

- 10.1 Provisions for liquidated damages, if any, are set forth in the Agreement.

## ARTICLE 11 SUBSTITUTE AND "OR EQUAL" ITEMS

- 11.1 The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or "or equal" items. Whenever it is specified or described in the Bidding Documents that a substitute or "or equal" item of material or equipment may be furnished or used by Contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the effective date of the Agreement. The procedure for submission of any such application by Contractor and consideration by Engineer is set forth in the General Conditions and may be supplemented in the General Requirements.

## ARTICLE 12 PREPARATION OF BID

- 12.1 A Bid must be made on the Bid form included with the Project Manual. The Bid form shall not be altered in any way. Each copy of the Bidding Documents contains a separate, unbound copy of the Bid form to be used for submittal.

- 12.2 The Bid form must be completed in ink. Blank spaces in the Bid form must be filled in correctly where indicated, and the Bidder must state, both in words and numerals, the prices for which he proposes to complete each and every item of Work. Ditto marks shall not be used.
- 12.3 A Bidder shall execute his Bid as stated below.
- A. A Bid by an individual shall show his name and official address.
  - B. A Bid by a partnership must be executed in the partnership name and signed by a partner accompanied by evidence of authority to sign. His title must appear under this signature and the official address of the partnership shall be shown.
  - C. A Bid by a corporation must be executed in the corporate name by an officer of the corporation and must be accompanied by a certified copy of a resolution of the board of directors authorizing the person signing the Bid to do so on behalf of the corporation. The corporate seal shall be affixed and attested by the secretary. The state of incorporation and the official corporate address shall be shown.
  - D. A Bid by a limited liability company shall be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm shall be shown.
  - E. A Bid by a joint venture shall be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture shall be shown.
  - F. All names must be printed below the signature.
- 12.4 The Bid shall contain an acknowledgment of the receipt of all Addenda in the space provided on the Bid form.
- 12.5 Postal and email addresses and telephone number to which communications regarding the Bid are to be directed shall be shown.
- 12.6 The following listed documents shall be submitted in addition to the Bid form:
- A. Bid Deposit
  - B. Certified copy of Resolution of Board of Directors
  - C. Contractor experience and project summary
- 12.7 In order to be considered for selection, the Bidder must submit a complete bid package in accordance with these Bidding Documents. Partial Bids will not be accepted.
- 12.8 Any deviations in completion of the Bid Form and accompanying documents from the instructions provided in this Article 12 may be cause for rejection of the Bid.

## ARTICLE 13 BASIS OF BID

### 13.1 Unit Price

- A. Bidders shall submit a Bid on a unit price basis for each item of Work listed in the Bid schedule.
- B. The total of all bid prices will be the sum of the products of the estimated quantity of each item and the corresponding unit price. The final quantities and Contract Price will be determined in accordance with paragraph 11.03 of the General Conditions.
- C. Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum. Discrepancies between words and figures will be resolved in favor of the words.
- D. Unit prices for identical item numbers that are in more than one bid schedule shall be equal. Discrepancies will be resolved in favor of the lowest unit price.

### 13.2 Allowances

- A. The Bid price shall include such amounts as the Bidder deems proper for Contractor's overhead, costs, profit, and other expenses on account of cash allowances, if any, named in the Contract Documents in accordance with paragraph 11.02 of the General Conditions.

### 13.3 Alternates

- A. The price for alternates included in the Bid form will be the amount added to the base Bid if Owner selects the alternate. In the evaluation of Bids, alternates will be applied in the same order as listed in the Bid form. The award will be based on the lowest eligible Bid including all selected alternates.

## ARTICLE 14 SUBMISSION OF BID

- 14.1 A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the Advertisement for Bids, section 00100 and shall be enclosed in an opaque sealed envelope plainly marked with the Project title, the name and address of Bidder, and shall be accompanied by the Bid Security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate envelope plainly marked on the outside with the notation "TOWN OF LONGMEADOW, MORNINGSIDE DRIVE CULVERT REPLACEMENT PROJECT, BID ENCLOSED". When using the mail or other delivery system, the Bidder is totally responsible for the mail or other delivery system delivering the Bid at the place and prior to the time indicated in the Advertisement for Bids. A mailed Bid shall be addressed to: Town of Longmeadow, Purchasing Department Attn: Chad Thompson, Procurement Manager, 735 Longmeadow Street, Suite 101, Longmeadow, MA, 01106.

## ARTICLE 15 MODIFICATION OR WITHDRAWAL OF BID

### 15.1 Withdrawal Prior to Bid Opening

- A. A Bidder may withdraw his Bid before the time fixed for the opening of Bids by communicating his purpose in writing to Owner. Upon receipt of such written notice, the unopened Bid will be returned to the Bidder.

#### 15.2 Modification Prior to Bid Opening

- A. If a Bidder wishes to modify his Bid, he must withdraw his initial Bid in the manner specified in paragraph 15.1.A and submit a new Bid.

### ARTICLE 16 OPENING OF BIDS

- 16.1 Bids will be opened as indicated in the Advertisement for Bids and publicly read aloud.
- 16.2 In order to be considered for selection, Bids must arrive at the designated location on or before the date and time specified in the Advertisement for Bids. Bidders mailing their Bids should allow for normal mail delivery time to ensure timely receipt of their Bids by Owner.
- 16.3 Bids received by mail or otherwise after the time specified for the opening of Bids will not be accepted and will be returned to the Bidder unopened.
- 16.4 No responsibility will attach to Owner, its employees or the Engineer for premature opening of a Bid not properly addressed and identified in accordance with the Bidding Documents.

### ARTICLE 17 DISQUALIFICATION OF BIDDERS

- 17.1 More than one Bid for the same Work from an individual, or a firm, partnership, corporation or an association under the same or different names will not be considered. Reasonable grounds for believing that any Bidder is interested in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder is interested.

### ARTICLE 18 BIDS TO REMAIN OPEN

- 18.1 All Bids will remain subject to acceptance for the period of time stated in the Bid form, but Owner may, in its sole discretion, release any Bid and return the Bid deposit prior to the end of this period.

### ARTICLE 19 AWARD OF CONTRACT

- 19.1 Owner reserves the right to reject any and all Bids, to waive any and all informalities, and the right to disregard all nonconforming, nonresponsive or conditional Bids.
- 19.2 Owner reserves the right to reject any Bid not accompanied by specified documentation and Bid deposit.
- 19.3 Owner reserves the right to reject any Bid if it shows any omissions, alterations of form, additions not called for, conditions or qualifications, or irregularities of any kind.
- 19.4 Owner reserves the right to reject any Bid that, in his sole discretion, is considered to be unbalanced or unreasonable as to the amount bid for any lump sum or unit price item.

- 19.5 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.
- 19.6 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions.
- 19.7 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities to perform the Work in accordance with the Contract Documents.
- 19.8 If a contract is to be awarded, it will be awarded to the lowest responsive and responsible Bidder who has neither been disqualified nor rejected pursuant to Article 17 or this Article 19.
- 19.9 Contents of the Bid of the Successful Bidder will become part of any contract awarded.

## ARTICLE 20 CONTRACT SECURITIES

- 20.1 Performance and payment bonds shall be furnished by the successful Bidder. The amounts of and other requirements for performance and payment bonds are stated in Article 5 of the General Conditions. Performance and payment bonds submitted shall be posted by a recognized surety company having a place of business in the Commonwealth of Massachusetts. All performance and payment bonds signed by an agent must be accompanied by a certified copy of the authority to act. Additional requirements may be stated in the General or Supplementary Conditions.
- 20.2 Within 5 days from the date of the Notice of Award, the Successful Bidder shall deliver to Owner and Engineer, for review and approval, the performance bond and the payment bond he proposes to furnish at the time of the execution of the Agreement.
- 20.3 The required contract securities will become part of the Contract Documents.

## ARTICLE 21 CONTRACT INSURANCE

- 21.1 The requirements for insurance to be provided by the Successful Bidder are stated in Article 5 of the General Conditions and in the Supplementary Conditions.
- 21.2 Within 5 days from the date of the Notice of Award, the Successful Bidder shall deliver evidence of required insurance to Owner and Engineer.
- 21.3 The required insurance certificates will become part of the Contract Documents.

## ARTICLE 22 EXECUTION OF AGREEMENT

- 22.1 After receipt of acceptable contract securities and insurance certificates from the Successful Bidder, the Owner will transmit the required number of unsigned Contract Documents to the Contractor. Within 5 days of receipt of the unsigned agreement and Contract Documents, the Contractor shall sign the Agreements and return the Contract Documents to the Owner. The Owner will return one executed Contract to the Contractor.



## ARTICLE 23 SALES TAXES

23.1 Owner is exempt from Massachusetts State sales and use taxes on materials and equipment to be incorporated in the Work. Said taxes shall not be included in the Bid. The tax exemption number will be provided to the Successful Bidder.

## ARTICLE 24 MASSACHUSETTS WAGE RATES

24.1 Minimum Wage Rates as determined by the Commissioner of Department of Workforce Development under the provision of the Massachusetts General Laws, Chapter 149, Sections 26 to 27D, as amended, apply to this project. The Wage Rate Determination is included in Part II of the Supplementary Conditions.

24.2 It is the responsibility of the Bidder before bid opening to request, if necessary, any additional information on Minimum Wage Rates for those tradespeople who are not covered by the applicable Wage Rate Determination, but who may be employed for the proposed Work under this Contract.

## ARTICLE 25 MASSACHUSETTS REQUIREMENTS

25.1 Applicable provisions of Massachusetts General Laws and Regulations and/or the United States Code and Code of Federal Regulations govern this Contract and any provision in violation of the foregoing shall be deemed null, void, and of no effect. Where conflict between Code of Federal Regulations and State Laws and Regulations exist, the more stringent requirement shall apply.

25.2 The Contractor guarantees that the Work and Services to be performed under the Contract, and all workmanship, materials, and equipment performed, furnished, used, or installed in the construction of the same shall be free from defects and flaws, and shall be performed and furnished in strict accordance with the Drawings, Specifications, and other Contract documents, that the strength of all parts of all manufactured equipment shall be adequate and as specified and that the performance test requirements of the Contract shall be fulfilled. This guarantee shall be for a period of one year from after the date of completion and acceptance of the Work as stated in the final estimate. If part of the Work is accepted in accordance with that subsection of the Agreement titled "Partial Acceptance", the guarantee for that part of the Work shall be for a period of one year from the date of such fixed acceptance.

- 25.3 If at any time within the said period of guarantee any part of the Work requires repairing, correction, or replacement, the Owner may notify the Contractor in writing to make the required repairs, correction, or replacements. If the Contractor neglects to commence making such repairs, corrections, or replacements to the satisfaction of the Owner within seven days from the date of receipt of such notice, or having commenced fails to prosecute such Work with diligence, the Owner may employ other persons to make said repairs, correction, or replacements, and charge the costs, including compensation for additional professional services, to the Contractor.
- 25.4 This project is subject to the Safety and Health Regulations of the U.S. Department of Labor set forth in Title 29 CFR, Part 1926 and to all subsequent amendments, 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.
- 25.5 Whenever 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 an "Efficiency Guarantee Bond" or cash deposit for the duration of the specified time period which will guarantee replacement of that equipment in the event of failure.

END OF SECTION

SECTION 00300  
GEOTECHNICAL DATA

PART 1 GENERAL

1.1 SUMMARY

- A. For the preparation of Bidding Documents, Engineer has relied upon the following reports and tests of subsurface and latent physical conditions of the site. The location of all bore holes is shown on the Drawings.
1. Soil boring data (attached)
    - a. The subsurface data are not guaranteed as to accuracy or completeness, nor are they a part of the Contract Documents.
    - b. Bidders are cautioned that the subsurface data have been utilized for general design purposes only. No explicit or implicit representation is made as to the nature of the materials which may be encountered below the surface of the ground.
    - c. The making available of this subsurface data to Bidders is not intended to relieve them from their responsibility to familiarize themselves with the subsurface and other site conditions.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

S:\Massachusetts\Clients\Longmeadow\Morningside Drainage\Specifications\00300.docx



# Geosearch Inc.

Client: DPC Engineering, LLC Date: 11/29/18 Page # 1 of 2

Location: Morningside Drive, Longmeadow, MA

Boring No. 1 Ground Elev Date Start 11/29/18 Date Complete 11/29/18 Drilling Foreman: Rodney Dean Eng/Hydrol. Geologist: Gray Fisher

D E P T H	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
5	S-1	0-2'	1-2-4-5	22		Very loose to loose, soft to stiff, silty SAND	
	S-2	2'-4'	5-5-6-7	17		Loose to medium dense, stiff, silty SAND	
	S-3	4'-6'	2-3-5-6	14		Loose to medium dense, medium stiff to stiff, silty SAND	
	S-4	6'-8'	5-6-6-5	16		Medium dense, stiff, silty SAND	
10	S-5	8'-10'	1-1-2-3	17		Very loose to loose, very soft to medium stiff, sandy SILT	
	S-6	10'-12'	1-1-1-2	15		Very loose, very soft to soft, sandy SILT	
15	S-7	12'-14'	3-3-2-2	18	12'	Loose, medium stiff, moist, sandy SILT    Groundwater @12'	
	S-8	14'-16'	1-1-1-1	17		Very loose, very soft, moist, silty CLAY	
	S-9	16'-18'	3-4-4-6	19		Loose, medium stiff to stiff, clayey SILT, moist	
20	S-10	18-20'	1-1-1-1	14		Very loose, very soft, silty SAND, very wet	
	S-11	20'-22'	1-1-2-2	13		Very loose, very soft to soft, clayey SAND, very wet	
25	S-12	22'-24'	1-2-2-1	10		Very loose, soft, sandy CLAY, wet	
	S-13	24'-26'	1-1-1-2	20		Very loose, very soft to soft, sandy CLAY/SAND, wet	
30	S-14	26'-28'	1-3-3-3	20		Loose, medium stiff, silty CLAY, wet	
	S-15	28'-30'	1-1-1-1	24		Very loose, very soft, silty CLAY, wet	
	S-16	30'-32'	1-1-1-2	18		Very loose, very soft to soft, silty CLAY/CLAY, very wet	
35	S-17	32'-34'	1-4-2-2	24		Loose, soft to medium stiff, CLAY, wet	
	S-18	34'-36'	1-1-1-1	24		Very loose, very soft, CLAY, wet	

Type Of Boring:	Casing Size	Hollow Stem Auger Size	Standard Penetration Test (ST) = 140lb hammer falling 30"	
Proportion Percentages		Granular Soils (blows per ft.)	Cohesive Soils (blows per ft.)	
Trace 0 to 10%		0 to 4 Very Loose                      30 to 50 Dense	0 to 2 Very Soft	8 to 15 Stiff
Some 10 to 40%		4 to 10 Loose                              Over 50 Very Dense	2 to 4 Soft	15 to 30 Very Stiff
And 40 to 50%		10 to 30 Medium Dense	4 to 8 Medium Stiff	Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.				



# Geosearch Inc.

Client: DPC Engineering, LLC Date: 11/29/18 Page # 1 of 2

Location: Morningside Drive, Longmeadow, MA

Boring No.2 Ground Elev Start 11/29/18 Complete 11/29/18 Drilling Foreman: Rodney Dean Eng/Hydr. Geologist: Gray Fisher

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
5	S1	0-2'	2-3-5-7	22	8'	Loose to medium dense, medium stiff to stiff, silty SAND	
	S2	2'-4'	5-7-8-8	18		Medium dense, stiff to very stiff, silty SAND	
	S3	4'-6'	4-4-6-6	22		Loose to medium dense, medium stiff to stiff, silty SAND	
	S4	6'-8'	5-4-4-4	20			
10	S5	8'-10'	1-1-1-1	15	Very loose, very stiff, silty SAND, moist		
	S6	10'-12'	1-1-2-2	18	Very loose to loose, very soft, clayey SILT, moist		
	S7	12'-14'	6-4-4-3	14	Loose to medium dense, stiff to medium stiff, silty SAND, moist		
15	S8	14'-16'	1-1-1-1	17	Very loose, very soft, clayey SILT, moist		
	S9	16'-18'	2-3-3-4	24	Loose, medium stiff, silty CLAY, moist		
20	S10	18'-20'	1-1-1-1	21	Very loose, very soft, silty CLAY, moist		
	S11	20'-22'	1-1-1-1	21			
	S12	22'-24'	1-1-1-1	24			
25	S13	24'-26'	1-1-1-1	22			
	S14	26'-28'	2-3-2-3	24	Loose, medium stiff, CLAY, wet		
30	S15	28'-30'	1-1-1-1	23	Very loose, very soft, CLAY, wet		
	S16	30'-32'	1-1-1-1	16			
	S17	32'-34'	1-2-1-2	24			
35	S18	34'-36'	1-1-1-1	22			

Type Of Boring:	Casing Size	Hollow Stem Auger Size	Standard Penetration Test (ST) = 140lb hammer falling 30"
Proportion Percentages	Granular Soils (blows per ft.)		Cohesive Soils (blows per ft.)
Trace 0 to 10%	0 to 4 Very Loose	30 to 50 Dense	0 to 2 Very Soft      8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose	Over 50 Very Dense	2 to 4 Soft      15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense		4 to 8 Medium Stiff      Over 30 Hard
Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.			

# Geosearch Inc.

**Client:** DPC Engineering, LLC      **Date:** 11/29/18      **Page #** 2 of 2

**Location:** Morningside Drive, Longmeadow, MA

**Boring** Ground      **Date**      **Date**      **Drilling**      **Eng/Hydrol.**  
**No.2**      **Elev**      **Start** 11/29/18 **Complete** 11/29/18 **Foreman:** Rodney Dean      **Geologist:** Gray Fisher

DEPTH	Sample Data				Casing Blows Per Ft.	Strata Change Depth	Visual Identification of Soil and/or Rock Strata
	Sample		Blows	Rec.			
	NO.	Depth(ft.)	6" Penetration	Inches			
	S-19	36'-38'	0-2-1-1	24			Very loose, very, soft, silty CLAY, wet
40'	S-20	38'-40'	2-2-3-3	24			Very loose to loose, medium stiff, silty CLAY, wet

**Type Of Boring:**      **Casing Size**      **Hollow Stem Auger Size**      **Standard Penetration Test (ST) = 140lb hammer falling 30"**

Proportion Percentages	Granular Soils (blows per ft.)		Cohesive Soils (blows per ft.)	
Trace 0 to 10%	0 to 4 Very Loose	30 to 50 Dense	0 to 2 Very Soft	8 to 15 Stiff
Some 10 to 40%	4 to 10 Loose	Over 50 Very Dense	2 to 4 Soft	15 to 30 Very Stiff
And 40 to 50%	10 to 30 Medium Dense		4 to 8 Medium Stiff	Over 30 Hard

Blows are per 6" taken with an 24" long X 2" OD X 1 3/8" I.D.





## SECTION 00410

### BID FORM

#### PROJECT IDENTIFICATION:

Morningside Drive Culvert Replacement Project  
Longmeadow, Massachusetts

#### TABLE OF ARTICLES

1. Bid Recipient
2. Bidder's Acknowledgements
3. Bidder's Representations
4. Bidder's Certifications
5. Basis of Bid
6. Time of Completion
7. Attachments to This Bid
8. Bid Submittal

#### ARTICLE 1 - BID RECIPIENT

##### 1.1 This Bid is submitted to:

Town of Longmeadow  
Purchasing Department  
Attn: Chad Thompson, Procurement Manager  
735 Longmeadow Street, Suite 101  
Longmeadow, MA 01106

- 1.2 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

#### ARTICLE 2 - BIDDER'S ACKNOWLEDGEMENTS

- 2.1 Bidder accepts all of the terms and conditions of the Advertisement for Bids and Instructions to Bidders, including without limitation, those dealing with the disposition of Bid deposit. The Bid will remain subject to acceptance for 30 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.
- 2.2 The Work under this Contract shall be subject to the provisions of Chapter 30, Section 39M of the Massachusetts General Laws.

### ARTICLE 3 - BIDDER'S REPRESENTATIONS

- 3.1 In submitting this Bid, Bidder represents, as set forth in the Agreement, that:
- A. Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents and the Addenda, receipt of all which is hereby acknowledged.
  - B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, and performance of the Work.
  - C. Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.
  - D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities) that have been identified in the Supplementary Conditions as provided in paragraph 4.02 of the General Conditions, and (2) reports and drawings of Hazardous Environmental Conditions, if any, at the Site that have been identified in SC-4.06 as containing reliable "technical data."
  - E. Bidder has considered the information known to Bidder; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents; and (3) Bidder's safety precautions and programs.
  - F. Based on the information and observations referred to in Paragraph 3.1E above, Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times required and in accordance with the other terms and conditions of the Bidding Documents.
  - G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
  - H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.
  - I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

#### ARTICLE 4 - BIDDER'S CERTIFICATION

- 4.1 Bidder 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 in the work, that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee, and that all employees to be employed in the work subject to this bid have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration.
- 4.2 Bidder hereby certifies under the penalties of perjury, to the best of Bidder's knowledge and belief, that Bidder has filed all State tax returns and paid all State taxes required by law.
- 4.3 Bidder 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 herein the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity.

#### ARTICLE 5 - BASIS OF BID

- 5.1 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):



Item Number	Item Name and Unit Bid Prices Written in Words and Figures	Estimated Quantity	Total Amount of Item (in figures)
1	Mobilization and Demobilization, per lump sum, the price of:  _____ ) (\$ _____)	lump sum =	\$ _____
2	Traffic Control (excludes Police), per lump sum, the price of:  _____ ) (\$ _____)	lump sum =	\$ _____
3	Clearing and Grubbing, per lump sum, the price of:  _____ ) (\$ _____)	lump sum =	\$ _____
4	Test Pits, per cubic yard, the price of:  _____ ) (\$ _____)	x 25 c.y. =	\$ _____
5	Unsuitable Material Excavation, per cubic yard, the price of:  _____ ) (\$ _____)	x 25 c.y. =	\$ _____
6	Gravel Borrow, per cubic yard, the price of:  _____ ) (\$ _____)	x 25 c.y. =	\$ _____
7	Crushed Stone Borrow, per cubic yard, the price of:  _____ ) (\$ _____)	x 25 c.y. =	\$ _____



Item Number	Item Name and Unit Bid Prices Written in Words and Figures	Estimated Quantity	Total Amount of Item (in figures)
8	Ordinary Borrow, per cubic yard, the price of:  _____	x 25 c.y. =	\$ _____
	(\$ _____ )		
9	Sand Borrow, per cubic yard, the price of:  _____	x 25 c.y. =	\$ _____
	(\$ _____ )		
10	Siltation Fencing, per linear foot, the price of:  _____	x 1,390 l.f. =	\$ _____
	(\$ _____ )		
11	Siltation Socks, per linear foot, the price of:  _____	x 380 l.f. =	\$ _____
	(\$ _____ )		
12	Catch Basin Sedimentation Control, per each, the price of:  _____	x 4 each =	\$ _____
	(\$ _____ )		
13	SMH#2- Precast Concrete Manhole Riser Section and Frame & Cover, per lump sum, the price of:  _____	lump sum =	\$ _____
	(\$ _____ )		



Item Number	Item Name and Unit Bid Prices Written in Words and Figures	Estimated Quantity	Total Amount of Item (in figures)
14	DMH#1- 8' x 8' Precast Concrete Structure with Manhole Riser Section and Frame & Cover, per lump sum, the price of:  _____	lump sum =	\$ _____
	(\$ _____ )		
15	Catch Basin Top Slab/Inlet Structure, per each, the price of:  _____	x 2 each =	\$ _____
	(\$ _____ )		
16	8-inch Mainline PVC Gravity Sewer Pipe, per linear foot, the price of:  _____	x 100 l.f. =	\$ _____
	(\$ _____ )		
17	Sanitary Sewer/Drain Mainline Connections, per each, the price of:  _____	x 4 each =	\$ _____
	(\$ _____ )		
18	60-inch Polypropylene Drain Pipe, per linear foot, the price of:  _____	x 150 l.f. =	\$ _____
	(\$ _____ )		
19	18-inch Polypropylene Drain Pipe, per linear foot, the price of:  _____	x 50 l.f. =	\$ _____
	(\$ _____ )		



Item Number	Item Name and Unit Bid Prices Written in Words and Figures	Estimated Quantity	Total Amount of Item (in figures)
20	12-inch Polypropylene Drain Pipe, per linear foot, the price of:  _____	x 60 l.f. =	\$ _____
	(\$ _____ )		
21	Temporary Water Main, per lump sum, the price of:  _____	lump sum =	\$ _____
	(\$ _____ )		
22	8-inch Ductile Iron Pipe & Fittings, per linear foot, the price of:  _____	x 120 l.f. =	\$ _____
	(\$ _____ )		
23	Hydrant Assemblies, per each, the price of:  _____	x 1 each =	\$ _____
	(\$ _____ )		
24	Water Main Connections, per each, the price of:  _____	x 2 each =	\$ _____
	(\$ _____ )		
25	Asbestos Cement Water and Sewer Pipe Removal and Disposal, per linear foot, the price of:  _____	x 220 l.f. =	\$ _____
	(\$ _____ )		



Item Number	Item Name and Unit Bid Prices Written in Words and Figures	Estimated Quantity	Total Amount of Item (in figures)
26	Bituminous Concrete Paving, per square yard, the price of:  _____	x 390 s.y. =	\$ _____
	(\$ _____ )		
27	Bituminous Concrete Curbing, per linear foot, the price of:  _____	x 280 l.f. =	\$ _____
	(\$ _____ )		
28	Steel-Backed Wooden Guardrail, per linear foot, the price of:  _____	x 170 l.f. =	\$ _____
	(\$ _____ )		
29	North Side of Culvert- Area Restoration and Slope Grading/Stabilization, per lump sum, the price of:  _____	lump sum =	\$ _____
	(\$ _____ )		
30	South Side of Culvert- Area Restoration and Slope Grading/Stabilization, including Riprap Embankment, per lump sum, the price of:  _____	lump sum =	\$ _____
	(\$ _____ )		
31	Loam & Seed (in tree belt adjacent to roadway, excluding culvert slopes), per lump sum, the price of:  _____	lump sum =	\$ _____
	(\$ _____ )		





Item Number	Item Name and Unit Bid Prices Written in Words and Figures	Estimated Quantity	Total Amount of Item (in figures)
-------------	---------------------------------------------------------------	--------------------	-----------------------------------

32 Temporary Support of Utility Pole(s), per lump sum, the price of:  
 \_\_\_\_\_ lump sum = \$ \_\_\_\_\_

(\$ \_\_\_\_\_ )

33 Gas Utility Allowance for Temporary Gas Main and Replacement of Existing Gas Line, the price of:  
Twenty-five thousand dollars and zero cents allowance = \$ 25,000.00

(\$ 25,000.00 )

**TOTAL AMOUNT OF BID (Base Bid) – Items 1 through 33**

\_\_\_\_\_ dollars  
 (words)

(\$ \_\_\_\_\_ )  
 (figures)

5.2 Additive Alternate No. 1:

Item Name and Unit Bid Prices Written in Words and Figures	Estimated Quantity	Total Amount of Item (in figures)
---------------------------------------------------------------	--------------------	-----------------------------------

CB#1 and CB#2- Replacement of Catch Basin Top Slabs/Inlet Structures, and all work incidental thereto, the price of:

\_\_\_\_\_ lump sum = \$ \_\_\_\_\_  
 (\$ \_\_\_\_\_ )



5.3 Additive Alternate No. 2:

Item Name and Unit Bid Prices Written in Words and Figures	Estimated Quantity	Total Amount of Item (in figures)
---------------------------------------------------------------	-----------------------	--------------------------------------

Chemical Sealing and Cementitious Lining of SMH#2, and all work incidental thereto, the price of:

\_\_\_\_\_ lump sum = \$ \_\_\_\_\_  
 (\$ \_\_\_\_\_ )

5.4 Acknowledge the receipt of all issued addenda. This Bid includes Addenda numbered 1, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_.

5.5 The price for alternates included in the Bid form will be the amount added to the base Bid if Owner selects the alternate. In the evaluation of Bids, alternates will be applied in the same order as listed in the Bid form. The award will be based on the Base Bid, Base Bid plus Additive Alternate No. 1, or Base Bid plus Additive Alternate No. 1 plus Additive Alternate No. 2.

ARTICLE 6 - TIME OF COMPLETION

- 6.1 Bidder agrees that the Work will be substantially completed and completed and ready for final payment in accordance with paragraph 14.07.B of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.
- 6.2 Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times specified above, which shall be stated in the Agreement.

ARTICLE 7 - ATTACHMENTS TO THIS BID

- 7.1 The following documents are attached to and made a condition of this Bid:
  - A. A bid deposit in the amount of five percent (5%) payable to the Town of Longmeadow in the form of a bid bond, certified check, treasurer's check or cashier's check issued by a responsible bank or trust company. Bid deposit in the amount of \_\_\_\_\_ dollars (\$\_\_\_\_\_), consisting of a bid bond or certified check, in the amount of five percent of the total amount of bid.
  - B. List of Subcontractors



ARTICLE 8 - BID SUBMITTAL

8.1 The Bid is submitted by:

Date \_\_\_\_\_

\_\_\_\_\_  
(Print Name of Firm Submitting a General Bid)

\_\_\_\_\_  
(Signature of Authorized Representative)

\_\_\_\_\_  
(Print Name of Person Signing Bid and Title)

Social Security Number or \_\_\_\_\_

Federal Identification Number: \_\_\_\_\_ (Business Address)

\_\_\_\_\_  
(City, State and Zip Code)

Phone #: \_\_\_\_\_

Fax #: \_\_\_\_\_

Email: \_\_\_\_\_



Complete the section applicable to the business type of the BIDDER:

**An Individual**

By \_\_\_\_\_

(Individual's Signature)

\_\_\_\_\_

(Printed or Typed Name of Individual)

Doing Business as \_\_\_\_\_

License or Registration Number: \_\_\_\_\_

Business Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone #: \_\_\_\_\_

Fax #: \_\_\_\_\_

**A Partnership**

By \_\_\_\_\_

(Firm's Name)

By \_\_\_\_\_

(Partner's Signature)

\_\_\_\_\_

(Printed or Typed Name and Title of Partner)

License or Registration Number: \_\_\_\_\_

Business Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone #: \_\_\_\_\_

Fax #: \_\_\_\_\_



**A Corporation**

By \_\_\_\_\_

(Corporation's Name)

\_\_\_\_\_

(State of Incorporation)

By \_\_\_\_\_

(Signature of Officer Authorized to Sign)

\_\_\_\_\_

(Printed or Typed Name and Title of Officer Authorized to Sign)

(CORPORATE SEAL)

Attest \_\_\_\_\_

(Secretary)

License or Registration Number: \_\_\_\_\_

Business Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Phone #: \_\_\_\_\_

Fax #: \_\_\_\_\_



**A Joint Venture**

By \_\_\_\_\_

(Signature)

\_\_\_\_\_

(Printed or Typed Name)

\_\_\_\_\_

(Address)

Phone #: \_\_\_\_\_

Fax #: \_\_\_\_\_

By \_\_\_\_\_

(Signature)

\_\_\_\_\_

(Printed or Typed Name)

\_\_\_\_\_

(Address)

Phone #: \_\_\_\_\_

Fax #: \_\_\_\_\_

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



## CERTIFICATE OF NON-COLLUSION

The undersigned certifies under the 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 or proposal)

---

(Name of Business)

---

(Date)



**CERTIFICATION AS TO PAYMENT OF STATE TAXES**

Pursuant to M.G.L.v.62C, S49A, I certify under the penalties of perjury that the Contractor has complied with all laws of the Commonwealth of Massachusetts relating to taxes.

\_\_\_\_\_

Social Security Number or Federal Identification Number

Signature of Individual or Corporate Name

By: \_\_\_\_\_

Corporate Officer

(If applicable)





**CONTRACTOR QUALIFICATIONS STATEMENT**

(To be submitted with bid)

The undersigned offers the following information as evidence of his qualifications to perform the work as bid upon according to all the requirements of the plans and specifications.

The bidder shall use the form provided below. Substitute forms of reference lists will not be considered.

Have been in business under present name for \_\_\_\_\_ years.

The names and addresses of all persons interested in the bid (if made by a partnership or corporation) as principals, are as follows:

---

---

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(Attach supplementary list if necessary)



BIDDER'S QUALIFICATIONS AND REFERENCES FORM

All questions must be answered, and the data given must be clear and comprehensive. Please type or print legibly. If necessary, add additional sheet for starred items. This information will be utilized by the Town for purposes of determining bidder responsiveness and responsibility with regard to the requirements and specifications of the Contract.

1.FIRM NAME: \_\_\_\_\_

2.WHEN ORGANIZED: \_\_\_\_\_

3. INCORPORATED?

\_\_\_\_\_ YES

\_\_\_\_\_ NO DATE AND STATE OF INCORPORATION : \_\_\_\_\_

4. IS YOUR BUSINESS REGISTERED WITH SOMWBA FOR THE FOLLOWING WOMEN AND/OR MINORITY CATEGORIES:

MBE? \_\_\_\_\_ YES \_\_\_\_\_ NO

WBE? \_\_\_\_\_ YES \_\_\_\_\_ NO or

MWBE? \_\_\_\_\_ YES \_\_\_\_\_ NO

5.LIST ALL CONTRACTS CURRENTLY ON HAND, SHOWING CONTRACT AMOUNT AND ANTICIPATED DATE OF COMPLETION:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6.HAVE YOU EVER FAILED TO COMPLETE A CONTRACT AWARDED TO YOU?

\_\_\_\_\_ YES

\_\_\_\_\_ NO

IF YES, WHERE AND WHY?

\_\_\_\_\_  
\_\_\_\_\_



7.HAVE YOU EVER DEFAULTED ON A CONTRACT? \_\_\_\_\_ YES \_\_\_\_\_ NO  
IF YES, PROVIDE DETAILS.

---

---

8.  
LIST YOUR VEHICLES/EQUIPMENT AVAILABLE FOR THIS CONTRACT:

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9.  
IN THE SPACES FOLLOWING, PROVIDE INFORMATION REGARDING  
**CONTRACTS COMPLETED BY YOUR FIRM LISTING ONLY PROJECTS OF  
SIMILAR NATURE TO THE PROJECT BEING BID.** THE CONTRACTOR SHALL  
HAVE EXPERIENCE WITH A SIMILAR PROJECT OF COMPARABLE SIZE. A  
MINIMUM OF TWO (S) CONTRACTS SHALL BE LISTED. PUBLICLY BID  
CONTRACTS ARE PREFERRED.

PROJECT NAME:  
\_\_\_\_\_

OWNER:  
\_\_\_\_\_

CITY/STATE:  
\_\_\_\_\_

DOLLAR AMOUNT: \$ \_\_\_\_\_ DATE COMPLETED: \_\_\_\_\_

PUBLICLY BID? \_\_\_\_\_ YES \_\_\_\_\_ NO

TYPE OF WORK?:  
\_\_\_\_\_

CONTACT PERSON: \_\_\_\_\_ TELEPHONE #: (\_\_\_\_) \_\_\_\_\_

CONTACT PERSON'S RELATION TO PROJECT?

\_\_\_\_\_  
(i.e., contract manager, purchasing agent, etc.)  
\_\_\_\_\_



PROJECT NAME:

\_\_\_\_\_

OWNER:

\_\_\_\_\_

CITY/STATE:

\_\_\_\_\_

DOLLAR AMOUNT: \$ \_\_\_\_\_ DATE COMPLETED:

\_\_\_\_\_

PUBLICLY BID? \_\_\_\_\_ YES \_\_\_\_\_ NO

TYPE OF WORK?

\_\_\_\_\_

CONTACT PERSON: \_\_\_\_\_ TELEPHONE #: (\_\_\_\_) \_\_\_\_\_

CONTACT PERSON'S RELATION TO PROJECT?

\_\_\_\_\_

(i.e., contract manager, purchasing agent, etc.)

\_\_\_\_\_

PROJECT NAME:

\_\_\_\_\_

OWNER:

\_\_\_\_\_

CITY/STATE:

\_\_\_\_\_

DOLLAR AMOUNT: \$ \_\_\_\_\_ DATE COMPLETED:

\_\_\_\_\_

PUBLICLY BID? \_\_\_\_\_ YES \_\_\_\_\_ NO

TYPE OF WORK?

\_\_\_\_\_

CONTACT PERSON: \_\_\_\_\_ TELEPHONE #: (\_\_\_\_) \_\_\_\_\_

CONTACT PERSON'S RELATION TO PROJECT? \_\_\_\_\_

(i.e., contract manager, purchasing agent, etc.)

\_\_\_\_\_

PROJECTNAME:

\_\_\_\_\_

OWNER:

\_\_\_\_\_

CITY/STATE:

\_\_\_\_\_

DOLLAR AMOUNT: \$ \_\_\_\_\_ DATE COMPLETED: \_\_\_\_\_



PUBLICLY BID? \_\_\_\_\_ YES \_\_\_\_\_ NO

TYPE OF WORK? \_\_\_\_\_

CONTACT PERSON: \_\_\_\_\_ TELEPHONE

#: (\_\_\_\_) \_\_\_\_\_

CONTACT PERSON'S RELATION TO PROJECT?

\_\_\_\_\_

(i.e., contract manager, purchasing agent, etc.)

\_\_\_\_\_

10.

The undersigned certifies that the information contained herein is complete and accurate and hereby authorizes and requests any person, firm, or corporation to furnish any information requested by the Town in verification of the recitals comprising this statement of Bidder's qualifications and experience.

DATE: \_\_\_\_\_

BIDDER: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_

PRINTED NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_



END OF SECTION



## SECTION 00520

### AGREEMENT

This Agreement, made this \_\_\_\_\_ day of \_\_\_\_\_ in the year two thousand and nineteen between the Town of Longmeadow, through its Town Manager acting through the office of the Select Board, hereinafter called OWNER and \_\_\_\_\_, hereinafter called CONTRACTOR, with an address of \_\_\_\_\_.

Owner and Contractor hereby agree as follows:

#### ARTICLE 1 WORK

1.1 Contractor shall complete all Work as specified or indicated in the Contract Documents for the Town of Longmeadow, Massachusetts, Invitation for Bid (IFB), Morningside Drive Culvert Replacement Project, dated August 8, 2019; and Addendum No.....(if issued)

#### ARTICLE 2 ENGINEER

2.1 The Project has been designed by the Town of Longmeadow, through its Department of Public Works. The WORK will be overseen and administered by the Town Engineer who is hereinafter called ENGINEER. ENGINEER will act as OWNER's representative, assuming all duties and responsibilities, rights and authority assigned to ENGINEER in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents.

#### ARTICLE 3 CONTRACT TIMES

##### 3.1 Dates for Substantial Completion and Final Payment

A. The Work will be substantially completed within 180 days from the date of the Notice to Proceed, the Substantial Completion date. The project will be completed and ready for final payment in accordance with paragraph 14.07 of the General Conditions within 210 days from the date of the Notice to Proceed.

##### 3.2 Liquidated Damages

A. Contractor and Owner recognize that time is of the essence and that Owner will suffer financial loss if the Work is not completed within the times specified in Paragraph 3.1 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize the delays, expense, and difficulties involved in proving in a legal or arbitration proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner \$500.00 for each day that expires after the time specified in Paragraph 3.1 above for Substantial Completion until the Work is substantially finally completed.

#### ARTICLE 4 CONTRACT PRICE

- 4.1 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the prices stated in Contractor's Bid, attached hereto as an exhibit.
- 4.2 The total amount will be adjusted by measurement of actual installed quantities in strict conformity with the provisions contained herein.
- 4.3 The total amount will be based on the inclusion of Bid alternates \_\_\_\_\_.

#### ARTICLE 5 PAYMENT PROCEDURES

- 5.1 Applications for Payment shall be processed in accordance with Article 14 of the General Conditions and in accordance with Massachusetts General Law.
- 5.2 Owner shall make progress payments on account of the Contract Price on the basis of processed Applications for Payment monthly during construction. All progress payments will be measured by the schedule of values established in Paragraph 2.07.A of the General Conditions, or in the event there is no schedule of values, as provided in the General Requirements.
- 5.3 Owner shall retain from progress payments 5 percent of the value of Work completed.

#### ARTICLE 6 CONTRACTOR'S REPRESENTATIONS

- 6.1 Contractor makes the following representations:
  - A. Contractor has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.
  - B. Contractor has visited the site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
  - C. Contractor is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.
  - D. Contractor has considered the information known to Contractor; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; and the Site-related reports and drawings identified in the Contract Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Contract Documents; and (3) Contractor's safety precautions and programs.
  - E. Based on the information and observations referenced in Paragraph 6.1 above, Contractor does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.



- F. Contractor is aware of the general nature of Work to be performed by Owner and others at the Site that relates to the Work as indicated in the Contract Documents.
- G. Contractor has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Contractor has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- H. The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

## ARTICLE 7 CONTRACT DOCUMENTS

### 7.1 Contents

- A. The Contract Documents consist of the following:
  - 1. This Agreement (pages 00520-1 to 00520-8, inclusive);
  - 2. 100% Performance Bond;
  - 3. 100% Payment Bond;
  - 4. General Conditions (title pages, table of contents, and pages 00700-1 to 00700-64, inclusive);
  - 5. Supplementary Conditions (pages 00800-1 to 00800-12, inclusive);
  - 6. General Requirements (Division 1);
  - 7. Specifications (Divisions 2 through 13);
  - 8. Plans (Sheets 1 to 8, inclusive);
  - 9. Addenda (numbers \_\_\_\_\_ to \_\_\_\_\_, inclusive);
  - 10. Prevailing Wage Rates 20190807-070
  - 11. Exhibits to this Agreement (enumerated as follows):
    - a. Contractor's Bid (pages 00410-1 to 00410-\_\_\_, inclusive);
    - b. Documentation submitted by Contractor prior to Notice of Award;
  - 12. The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:
    - a. Notice to Proceed;
    - b. Written Amendments;
    - c. Work Change Directives;
    - d. Change Order(s).
- B. The documents listed in Paragraph 7.1.A are attached to this Agreement (except as expressly noted otherwise above).

- C. There are no Contract Documents other than those listed above in this Article 7.
- D. The Contract Documents may only be amended, modified, or supplemented as provided in paragraph 3.04 of the General Conditions.

## ARTICLE 8 MISCELLANEOUS

### 8.1 Terms

- A. Terms used in this Agreement will have the meanings indicated in the General Conditions and the Supplementary Conditions.

### 8.2 Assignment of Contract

- A. No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.

### 8.3 Successors and Assigns

- A. Owner and Contractor each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

### 8.4 Severability

- A. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon Owner and Contractor, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.

### 8.5 Contractor Certifications

- A. Contractor certifies that it has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for or in executing the Contract. For the purposes of this Paragraph 8.5:
  - 1. “corrupt practice” means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process or in the Contract execution;
  - 2. “fraudulent practice” means an intentional misrepresentation of facts made (a) to influence the bidding process or the execution of the Contract to the detriment of Owner, (b) to establish Bid or Contract prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;

3. “collusive practice” means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish Bid prices at artificial, non-competitive levels; and
4. “coercive practice” means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

8.6 Safety and Protection: Protection of the work and Owner’s Property: The contractor shall at all times safety guard the owner’s property from injury or loss in connection with this agreement. The contractor shall at all times safety guard and protect their own work, and that of adjacent property from damage. The contractor shall replace or make good any such damage, loss or injury. The Contractor shall clean the work are and restore it to its original condition upon the completion of the work, the Contractor shall comply with all applicable OSHA, state and municipal regulations and requirements for services and facilities in the performance of all requirements of this contract. OSHA safety requirements and training certification shall be adhered to for all personnel working on Town property. IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement. Counterparts have been delivered to Owner and Contractor. All portions of the Contract Documents have been signed or identified by Owner and Contractor or on their behalf.

**(END OF SECTION)**

# PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

---

CONTRACTOR (*Name and Address*):                      SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

## CONTRACT

Effective Date of Agreement:  
Amount:  
Description (*Name and Location*):

## BOND

Bond Number:  
Date (*Not earlier than Effective Date of Agreement*):  
Amount:  
Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Performance Bond to be duly executed by an authorized officer, agent, or representative.

## CONTRACTOR AS PRINCIPAL

## SURETY

\_\_\_\_\_  
Contractor's Name and Corporate Seal (Seal)

\_\_\_\_\_  
Surety's Name and Corporate Seal (Seal)

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_  
Signature

Attest: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

*Note: Provide execution by additional parties, such as joint venturers, if necessary.*

Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner for the performance of the Contract, which is incorporated herein by reference.

1. If Contractor performs the Contract, Surety and Contractor have no obligation under this Bond, except to participate in conferences as provided in Paragraph 2.1.
2. If there is no Owner Default, Surety's obligation under this Bond shall arise after:
  - 2.1 Owner has notified Contractor and Surety, at the addresses described in Paragraph 9 below, that Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with Contractor and Surety to be held not later than 15 days after receipt of such notice to discuss methods of performing the Contract. If Owner, Contractor, and Surety agree, Contractor shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive Owner's right, if any, subsequently to declare a Contractor Default; and
  - 2.2 Owner has declared a Contractor Default and formally terminated Contractor's right to complete the Contract. Such Contractor Default shall not be declared earlier than 20 days after Contractor and Surety have received notice as provided in Paragraph 2.1; and
  - 2.3 Owner has agreed to pay the Balance of the Contract Price to:
    1. Surety in accordance with the terms of the Contract; or
    2. Another contractor selected pursuant to Paragraph 3.3 to perform the Contract.
3. When Owner has satisfied the conditions of Paragraph 2, Surety shall promptly, and at Surety's expense, take one of the following actions:
  - 3.1 Arrange for Contractor, with consent of Owner, to perform and complete the Contract; or
  - 3.2 Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or
  - 3.3 Obtain bids or negotiated proposals from qualified contractors acceptable to Owner for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by Owner and contractor selected with Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Contract, and pay to Owner the amount of damages as described in Paragraph 5 in excess of the Balance of the Contract Price incurred by Owner resulting from Contractor Default; or
  - 3.4 Waive its right to perform and complete, arrange for completion, or obtain a new contractor, and with reasonable promptness under the circumstances:
    1. After investigation, determine the amount for which it may be liable to Owner and, as soon as practicable after the amount is determined, tender payment therefor to Owner; or
    2. Deny liability in whole or in part and notify Owner citing reasons therefor.
4. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond 15 days after receipt of an additional written notice from Owner to Surety demanding that Surety perform its obligations under this Bond, and Owner shall be entitled to enforce any remedy available to Owner. If Surety proceeds as provided in Paragraph 3.4, and Owner refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice Owner shall be entitled to enforce any remedy available to Owner.
5. After Owner has terminated Contractor's right to complete the Contract, and if Surety elects to act under Paragraph 3.1, 3.2, or 3.3 above, then the responsibilities of Surety to Owner shall not be greater than those of Contractor under the Contract, and the responsibilities of Owner to Surety shall not be greater than those of Owner under the Contract. To the limit of the amount of this Bond, but subject to commitment by Owner of the Balance of the Contract Price to mitigation of costs and damages on the Contract, Surety is obligated without duplication for:

- 5.1 The responsibilities of Contractor for correction of defective Work and completion of the Contract;
- 5.2 Additional legal, design professional, and delay costs resulting from Contractor's Default, and resulting from the actions of or failure to act of Surety under Paragraph 3; and
- 5.3 Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of Contractor.

6. Surety shall not be liable to Owner or others for obligations of Contractor that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than Owner or its heirs, executors, administrators, or successors.

7. Surety hereby waives notice of any change, including changes of time, to Contract or to related subcontracts, purchase orders, and other obligations.

8. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located, and shall be instituted within two years after Contractor Default or within two years after Contractor ceased working or within two years after Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

9. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the address shown on the signature page.

10. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

11. Definitions.

- 11.1 Balance of the Contract Price: The total amount payable by Owner to Contractor under the Contract after all proper adjustments have been made, including allowance to Contractor of any amounts received or to be received by Owner in settlement of insurance or other Claims for damages to which Contractor is entitled, reduced by all valid and proper payments made to or on behalf of Contractor under the Contract.
- 11.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 11.3 Contractor Default: Failure of Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.
- 11.4 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – *(Name, Address and Telephone)*  
Surety Agency or Broker:  
Owner's Representative *(Engineer or other party)*:



# PAYMENT BOND

Any singular reference to Contractor, Surety, Owner, or other party shall be considered plural where applicable.

---

CONTRACTOR (*Name and Address*):

SURETY (*Name, and Address of Principal Place of Business*):

OWNER (*Name and Address*):

## CONTRACT

Effective Date of Agreement:

Amount:

Description (*Name and Location*):

## BOND

Bond Number:

Date (*Not earlier than Effective Date of Agreement*):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms set forth below, do each cause this Payment Bond to be duly executed by an authorized officer, agent, or representative.

## CONTRACTOR AS PRINCIPAL

## SURETY

\_\_\_\_\_  
Contractor's Name and Corporate Seal (Seal)

\_\_\_\_\_  
Surety's Name and Corporate Seal (Seal)

By: \_\_\_\_\_  
Signature

By: \_\_\_\_\_  
Signature (Attach Power of Attorney)

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

Attest: \_\_\_\_\_  
Signature

Attest: \_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

*Note: Provide execution by additional parties, such as joint venturers, if necessary.*



1. Contractor and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to Owner to pay for labor, materials, and equipment furnished by Claimants for use in the performance of the Contract, which is incorporated herein by reference.
2. With respect to Owner, this obligation shall be null and void if Contractor:
  - 2.1 Promptly makes payment, directly or indirectly, for all sums due Claimants, and
  - 2.2 Defends, indemnifies, and holds harmless Owner from all claims, demands, liens, or suits alleging non-payment by Contractor by any person or entity who furnished labor, materials, or equipment for use in the performance of the Contract, provided Owner has promptly notified Contractor and Surety (at the addresses described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens, or suits to Contractor and Surety, and provided there is no Owner Default.
3. With respect to Claimants, this obligation shall be null and void if Contractor promptly makes payment, directly or indirectly, for all sums due.
4. Surety shall have no obligation to Claimants under this Bond until:
  - 4.1 Claimants who are employed by or have a direct contract with Contractor have given notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
  - 4.2 Claimants who do not have a direct contract with Contractor:
    1. Have furnished written notice to Contractor and sent a copy, or notice thereof, to Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials or equipment were furnished or supplied, or for whom the labor was done or performed; and
    2. Have either received a rejection in whole or in part from Contractor, or not received within 30 days of furnishing the above notice any communication from Contractor by which Contractor had indicated the claim will be paid directly or indirectly; and
    3. Not having been paid within the above 30 days, have sent a written notice to Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to Contractor.
5. If a notice by a Claimant required by Paragraph 4 is provided by Owner to Contractor or to Surety, that is sufficient compliance.
6. Reserved.
7. Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by Surety.
8. Amounts owed by Owner to Contractor under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any performance bond. By Contractor furnishing and Owner accepting this Bond, they agree that all funds earned by Contractor in the performance of the Contract are dedicated to satisfy obligations of Contractor and Surety under this Bond, subject to Owner's priority to use the funds for the completion of the Work.
9. Surety shall not be liable to Owner, Claimants, or others for obligations of Contractor that are unrelated to the Contract. Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders, and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Paragraph 4.1 or Paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to Surety, Owner, or Contractor shall be mailed or delivered to the addresses shown on the signature page. Actual receipt of notice by Surety, Owner, or Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory requirement shall be deemed deleted herefrom and provisions conforming to such statutory requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory Bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. Definitions

15.1 Claimant: An individual or entity having a direct contract with Contractor, or with a first-tier subcontractor of Contractor, to furnish labor, materials, or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms “labor, materials or equipment” that part of water, gas, power, light, heat, oil, gasoline, telephone service, or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of Contractor and Contractor’s subcontractors, and all other items for which a mechanic’s lien may be asserted in the jurisdiction where the labor, materials, or equipment were furnished.

15.2 Contract: The agreement between Owner and Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3 Owner Default: Failure of Owner, which has neither been remedied nor waived, to pay Contractor as required by the Contract, or to perform and complete or otherwise comply with the other terms thereof.

FOR INFORMATION ONLY – *(Name, Address, and Telephone)*

Surety Agency or Broker:

Owner’s Representative *(Engineer or other)*:



# STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

**ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE**

and

Issued and Published Jointly by



AMERICAN COUNCIL OF ENGINEERING COMPANIES

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ASSOCIATED GENERAL CONTRACTORS OF AMERICA

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AMERICAN SOCIETY OF CIVIL ENGINEERS

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*A Practice Division of the*  
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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 and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. 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 which is evidence of the agreement between Owner and Contractor covering the Work.
  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. *Asbestos*—Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.
  5. *Bid*—The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
  6. *Bidder*—The individual or entity who submits a Bid directly to Owner.
  7. *Bidding Documents*—The Bidding Requirements and the proposed Contract Documents (including all Addenda).
  8. *Bidding Requirements*—The advertisement or invitation to bid, Instructions to Bidders, Bid security of acceptable form, if any, and the Bid Form with any supplements.
  9. *Change Order*—A document recommended by Engineer 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, issued on or after the Effective Date of the Agreement.
  10. *Claim*—A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.
  11. *Contract*—The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*—Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.
13. *Contract Price*—The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).
14. *Contract Times*—The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any; (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.
15. *Contractor*—The individual or entity with whom Owner has entered into the Agreement.
16. *Cost of the Work*—See Paragraph 11.01 for definition.
17. *Drawings*—That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.
18. *Effective Date of the Agreement*—The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.
19. *Engineer*—The individual or entity named as such in the Agreement.
20. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.
21. *General Requirements*—Sections of Division 1 of the Specifications.
22. *Hazardous Environmental Condition*—The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto.
23. *Hazardous Waste*—The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.
24. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. *Liens*—Charges, security interests, or encumbrances upon Project funds, real property, or personal property.
26. *Milestone*—A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.
27. *Notice of Award*—The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.
28. *Notice to Proceed*—A written notice given 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 under the Contract Documents.
29. *Owner*—The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.
30. *PCBs*—Polychlorinated biphenyls.
31. *Petroleum*—Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.
32. *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.
33. *Project*—The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.
34. *Project Manual*—The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.
35. *Radioactive Material*—Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.
36. *Resident Project Representative*—The authorized representative of Engineer who may be assigned to the Site or any part thereof.
37. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.
38. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

39. *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.
40. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.
41. *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 for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.
42. *Specifications*—That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.
43. *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 at the Site.
44. *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.
45. *Successful Bidder*—The Bidder submitting a responsive Bid to whom Owner makes an award.
46. *Supplementary Conditions*—That part of the Contract Documents which amends or supplements these General Conditions.
47. *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 Subcontractor.
48. *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 those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.
49. *Unit Price Work*—Work to be paid for on the basis of unit prices.
50. *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, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

51. *Work Change Directive*—A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

## 1.02 *Terminology*

- A. The words and terms discussed in Paragraph 1.02.B through F 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 Paragraph 9.09 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 14.04 or 14.05).

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. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.
- 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. 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 Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

### *2.02 Copies of Documents*

- A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

### *2.03 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 Agreement 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

Agreement. 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 Agreement, whichever date is earlier.

#### 2.04 *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 the date on which the Contract Times commence to run.

#### 2.05 *Before Starting Construction*

- A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), 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 Documents;
  - 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.

#### 2.06 *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 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, 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 instructions, receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

#### 2.07 *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 2.05.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 component parts of the Work.

### **ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, 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. Any labor, documentation, services, materials, or equipment that reasonably may be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the indicated result will be provided whether or not specifically called for, at no additional cost to Owner.
- C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

#### **3.02 *Reference Standards***

- A. Standards, Specifications, Codes, Laws, and Regulations
  1. Reference to standards, specifications, manuals, 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, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement 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, 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 Contract Documents. 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 Contract Documents.

### 3.03 *Reporting and Resolving Discrepancies*

#### A. *Reporting Discrepancies:*

1. *Contractor's Review of Contract Documents Before Starting Work:* Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor discovers, or has actual knowledge of, and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.
2. *Contractor's Review of Contract Documents During Performance of Work:* If, 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) any standard, specification, manual, or code, or (c) 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 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.
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 Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:
  - a. the provisions of any standard, specification, manual, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference in the Contract Documents); 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 *Amending and Supplementing Contract Documents*

- A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

- B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:
1. A Field Order;
  2. Engineer's approval of a Shop Drawing or Sample (subject to the provisions of Paragraph 6.17.D.3); or
  3. Engineer's written interpretation or clarification.

### 3.05 *Reuse of Documents*

- A. Contractor and any Subcontractor or Supplier 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
  2. 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.
- 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.

### 3.06 *Electronic Data*

- A. Unless otherwise stated in the Supplementary Conditions, the data furnished by Owner or Engineer to Contractor, or by Contractor to Owner or Engineer, that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.
- B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.
- C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

## **ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS**

### **4.01 *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. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.
- 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 the Work is to be performed 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.

### **4.02 *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 contiguous to the Site; and
  - 2. those drawings known to Owner of physical conditions relating to existing surface or subsurface structures at the Site (except Underground Facilities).
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "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.

#### 4.03 *Differing Subsurface or Physical Conditions*

- A. *Notice:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed 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 4.02 is materially inaccurate; or
  2. is of such a nature as to require a change in the Contract Documents; 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 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

- B. *Engineer’s Review:* After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner’s obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer’s findings and conclusions.

C. *Possible Price and Times Adjustments:*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition 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 meet any one or more of the categories described in Paragraph 4.03.A; and
  - 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 Paragraphs 9.07 and 11.03.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:
  - a. Contractor knew of the existence of such conditions at the time Contractor made a final 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
  - b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and

contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

- c. Contractor failed to give the written notice as required by Paragraph 4.03.A.
3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or 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) sustained by Contractor on or in connection with any other project or anticipated project.

#### 4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous 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 shall not be responsible for 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 such information and data;
  - b. locating all Underground Facilities shown or indicated in the Contract Documents;
  - c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction; and
  - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated:*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, 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 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the

consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

#### 4.05 *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.

#### 4.06 *Hazardous Environmental Condition at Site*

- A. *Reports and Drawings:* The Supplementary Conditions identify those reports and drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at the Site.
- B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "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 any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.
- D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) 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 4.06.E.
- E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered written notice to Contractor: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. 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, either party may make a Claim therefor as provided in Paragraph 10.05.
- F. 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. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.
- G. 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: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is



responsible. Nothing in this Paragraph 4.06.G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

- H. 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 a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

## **ARTICLE 5 – BONDS AND INSURANCE**

### *5.01 Performance, Payment, and Other Bonds*

- A. Contractor shall furnish performance and payment bonds, 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 Documents. 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 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds 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 each bond.
- C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, 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 requirements of Paragraphs 5.01.B and 5.02.

### *5.02 Licensed Sureties and Insurers*

- A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly

licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

### 5.03 *Certificates of Insurance*

- A. Contractor shall deliver to Owner, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.
- B. Owner shall deliver to Contractor, with copies to each additional insured and loss payee identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.
- C. Failure of Owner to demand such certificates or other evidence of Contractor's full compliance with these insurance requirements or failure of Owner to identify a deficiency in compliance from the evidence provided shall not be construed as a waiver of Contractor's obligation to maintain such insurance.
- D. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor.
- E. The insurance and insurance limits required herein shall not be deemed as a limitation on Contractor's liability under the indemnities granted to Owner in the Contract Documents.

### 5.04 *Contractor's Insurance*

- A. Contractor shall purchase and maintain such insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which 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:
  - 1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;
  - 2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;
  - 3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;
  - 4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

- a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or
  - b. by any other person for any other reason;
5. 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; and
  6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.
- B. The policies of insurance required by this Paragraph 5.04 shall:
1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, be written on an occurrence basis, include as additional insureds (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and 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;
  2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;
  3. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;
  4. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);
  5. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and
  6. include completed operations coverage:
    - a. Such insurance shall remain in effect for two years after final payment.
    - b. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

## 5.05 *Owner's Liability Insurance*

- A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, 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.

## 5.06 *Property Insurance*

- A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full 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 interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee;
  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, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, 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.
  3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);
  4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;
  5. allow for partial utilization of the Work by Owner;
  6. include testing and startup; and
  7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other loss payee to whom a certificate of insurance has been issued.
- B. Owner shall purchase and maintain such equipment breakdown insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors,

members, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as a loss payee.

- C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with this Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other loss payee to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.
- D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.
- E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under this Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

#### 5.07 *Waiver of Rights*

- A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies 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 of the insureds or loss payees thereunder. Owner and Contractor waive all rights against each other and their 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 Subcontractors and Engineer, and all other individuals or entities identified in the Supplementary Conditions as loss payees (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 as trustee 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 utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.
- C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.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, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

- A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the loss payees, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order.
- B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

- A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds

and insurance required of such party by the Contract Documents, 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. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

- A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

**ARTICLE 6 – CONTRACTOR'S RESPONSIBILITIES**

6.01 *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. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.
- 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.

6.02 *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. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

### 6.03 *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.
- B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, 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.

### 6.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 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 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.
  - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

### 6.05 *Substitutes and "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 specification or description 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 or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.
  - 1. *"Or-Equal" Items:* If in Engineer's sole discretion 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, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements



for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, 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; and
  - 3) it has a proven record of performance and availability of responsive service.
- 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.

2. *Substitute Items:*

- a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.
- b. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.
- c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented by the General Requirements, and as Engineer may decide is appropriate under the circumstances.
- d. 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:
  - 1) shall certify that the proposed substitute item will:
    - a) perform adequately the functions and achieve the results called for by the general design,
    - b) be similar in substance to that specified, and
    - c) be suited to the same use as that specified;

- 2) will state:
  - a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time,
  - b) 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
  - c) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;
- 3) will identify:
  - a) all variations of the proposed substitute item from that specified, and
  - b) available engineering, sales, maintenance, repair, and replacement services; and
- 4) shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change.

- B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.
- C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by a Change Order in the case of a substitute and an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.
- D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- E. *Engineer's Cost Reimbursement:* Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. 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.

- F. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

- A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.
- B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued. 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 any right of Owner or Engineer to reject defective Work.
- C. 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. 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 moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.
- D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.
- E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

- F. 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.
- G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as a loss payee on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or loss payees (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 such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

#### 6.07 *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.

#### 6.08 *Permits*

- A. Unless otherwise provided in the Supplementary Conditions, 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 opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

#### 6.09 *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 knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear 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. However, it shall not be Contractor's responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.
- C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

#### 6.10 *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.

#### 6.11 *Use of Site and Other Areas*

##### A. *Limitation on Use of Site and Other Areas:*

- 1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full

responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.
  3. 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 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 by or based upon Contractor's performance of the Work.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other 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 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 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 property to stresses or pressures that will endanger it.

#### 6.12 *Record Documents*

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

#### 6.13 *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, 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 owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.
- 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 6.13.A.2 or 6.13.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 (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 for protection of the Work 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 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

#### 6.14 *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.

6.15 *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.

6.16 *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.

6.17 *Shop Drawings and Samples*

- A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. *Shop Drawings:*

- a. Submit number of copies specified in the General Requirements.
- 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 6.17.D.

2. *Samples:*

- a. Submit number of Samples specified in the Specifications.
  - b. 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 6.17.D.
- B. 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. *Submittal Procedures:*

1. Before submitting each Shop Drawing or Sample, Contractor shall have:
  - a. reviewed and coordinated each 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 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 and approval of that 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 both a written communication separate from the Shop Drawings or Sample submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

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 (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
3. Engineer's review and approval 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 6.17.C.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's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

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.

6.18 *Continuing the Work*

- A. 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, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *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 representation of 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 or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or
7. any correction of defective Work by Owner.

#### 6.20 *Indemnification*

- A. 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 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 6.20.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 6.20.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.

#### 6.21 *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 law.

- 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, Shop Drawings 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 6.21, 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 6.17.D.1.
- E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

## **ARTICLE 7 – OTHER WORK AT THE SITE**

### *7.01 Related Work at Site*

- A. Owner may perform other work related to the Project at the Site with Owner's employees, or through other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:
  - 1. written notice thereof will be given to Contractor prior to starting any such other work; and
  - 2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.
- B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner, and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and properly coordinate the Work with theirs. 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. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

- C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, 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.

#### 7.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:
  - 1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
  - 2. the specific matters to be covered by such authority and responsibility will be itemized; and
  - 3. the extent of such authority and responsibilities will be provided.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

#### 7.03 *Legal Relationships*

- A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.
- B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's wrongful actions or inactions.
- C. Contractor shall be liable to Owner and any other contractor under direct contract to Owner for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's wrongful action or inactions.

### **ARTICLE 8 – OWNER'S RESPONSIBILITIES**

#### 8.01 *Communications to Contractor*

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

8.02 *Replacement of Engineer*

- A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

- A. Owner's duties with respect to providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

8.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

- A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *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.

8.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *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.

8.12 *Compliance with Safety Program*

- 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 pursuant to Paragraph 6.13.D.

**ARTICLE 9 – ENGINEER'S STATUS DURING CONSTRUCTION**

9.01 *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 Documents.

9.02 *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 9.09. 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.

### 9.03 *Project Representative*

- A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. 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.

### 9.04 *Authorized Variations in Work*

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which 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. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

### 9.05 *Rejecting Defective Work*

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

### 9.06 *Shop Drawings, Change Orders and Payments*

- A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.
- B. In connection with 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, see Paragraph 6.21.
- C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.
- D. In connection with Engineer's authority as to Applications for Payment, see Article 14.



9.07 *Determinations for Unit Price Work*

- A. 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 Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

- A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.
- B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believes that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.
- C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.
- D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

- A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents 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 14.07.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 9.09 shall also apply to the Resident Project Representative, if any, and assistants, if any.

#### 9.10 *Compliance with Safety Program*

- A. While at the Site, Engineer's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Engineer has been informed pursuant to Paragraph 6.13.D.

### **ARTICLE 10 – CHANGES IN THE WORK; CLAIMS**

#### 10.01 *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 by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).
- B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

#### 10.02 *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 as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.D.

#### 10.03 *Execution of Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;
2. 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; and
3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

#### 10.04 *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.

#### 10.05 *Claims*

- A. *Engineer's Decision Required:* All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.
- B. *Notice:* Written notice stating the general nature of each Claim shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Times shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

- C. *Engineer's Action:* Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:
1. deny the Claim in whole or in part;
  2. approve the Claim; or
  3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.
- D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.
- E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.
- F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

## **ARTICLE 11 – COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK**

### *11.01 Cost of the Work*

- A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs 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 11.01.B, 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, 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 11.01.
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 5.06.D), 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 telegrams, long distance telephone calls, telephone 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 Contractor is required by the Contract Documents to purchase and maintain.

B. *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, expeditors, 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 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which 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 Paragraphs 11.01.A.

C. *Contractor's Fee:* When all the Work 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 or when a Claim for an 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 12.01.C.

- D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, 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.

#### 11.02 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:*

1. Contractor agrees that:

- a. 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
- b. 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:*

1. 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.

#### 11.03 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. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.
- 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. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 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; and
  2. there is no corresponding adjustment with respect to any other item of Work; and
  3. Contractor believes that Contractor 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 12 – CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES**

### *12.01 Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. The value of any Work covered by a Change Order or of any Claim for 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, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or
  2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or
  3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).
- C. *Contractor's Fee:* 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 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;
    - b. for costs incurred under Paragraph 11.01.A.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 12.01.C.2.a and 12.01.C.2.b is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;
- d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;
- 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 12.01.C.2.a through 12.01.C.2.e, inclusive.

#### 12.02 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.
- B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

#### 12.03 *Delays*

- A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.
- B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, 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 Price or the Contract Times, or both. 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.

- C. If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is 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 described in this Paragraph 12.03.C.
- D. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or 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) sustained by Contractor on or in connection with any other project or anticipated project.
- E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

## **ARTICLE 13 – TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK**

### *13.01 Notice of Defects*

- A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. Defective Work may be rejected, corrected, or accepted as provided in this Article 13.

### *13.02 Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests 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.

### *13.03 Tests and Inspections*

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:
  - 1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in Paragraph 13.04.C; and
  3. as otherwise specifically provided in the Contract Documents.
- 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 and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.
  - E. 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.
  - F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

#### 13.04 *Uncovering Work*

- A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, 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, furnishing all necessary labor, material, and equipment.
- C. If it is found that the uncovered Work is defective, 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 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 Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.
- D. 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, Contractor may make a Claim therefor as provided in Paragraph 10.05.

#### 13.05 *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, 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.

#### 13.06 *Correction or Removal of Defective Work*

- A. Promptly after receipt of written notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. 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 removal (including but not limited to all costs of repair or replacement of work of others).
- B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

#### 13.07 *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 land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
  - 1. repair such defective land or areas; or
  - 2. correct such defective Work; or
  - 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 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. 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) will be paid by Contractor.
- 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 13.07, 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 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

#### 13.08 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. 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) 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 pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

#### 13.09 *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 in accordance with Paragraph 13.06.A, 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, 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 13.09, 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, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, 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 (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) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. 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 13.09.

## **ARTICLE 14 – PAYMENTS TO CONTRACTOR AND COMPLETION**

### *14.01 Schedule of Values*

- A. The Schedule of Values established as provided in Paragraph 2.07.A 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.

### *14.02 Progress Payments*

#### *A. 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 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.

B. *Review of Applications:*

1. Engineer will, within 10 days after receipt of each Application for Payment, 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 9.07, 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 Documents; 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 moneys 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 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:
  - a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;
  - b. the Contract Price has been reduced by Change Orders;
  - c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or
  - d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

*C. Payment Becomes Due:*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

*D. Reduction in Payment:*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:
  - a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;



- b. 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;
  - c. there are other items entitling Owner to a set-off against the amount recommended; or
  - d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.
2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action 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, when Contractor remedies the reasons for such action.
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 14.02.C.1 and subject to interest as provided in the Agreement.

#### 14.03 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

#### 14.04 *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 (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.
- 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 tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the tentative certificate to Owner, notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will, within said 14 days, execute and deliver to Owner and Contractor a definitive

certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

- D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.
- E. 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 tentative list.

#### 14.05 *Partial Utilization*

- 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. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and 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 14.04.A through D for that part of the Work.
  - 2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and 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 14.04 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 5.10 regarding property insurance.

#### 14.06 *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 is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

#### 14.07 *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, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.
2. The final Application for Payment shall be accompanied (except as previously delivered) by:
  - a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.6;
  - b. consent of the surety, if any, to final payment;
  - c. a list of all Claims against Owner that Contractor believes are unsettled; and
  - d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.
3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) 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.

##### 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 Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for

Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. 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 14.09. 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. *Payment Becomes Due:*

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

- A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

- A. The making and acceptance of final payment will constitute:
1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and
  2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

## ARTICLE 15 – SUSPENSION OF WORK AND TERMINATION

### 15.01 *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 notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

### 15.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will 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 established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);
  2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;
  3. Contractor's repeated disregard of the authority of Engineer; or
  4. Contractor's violation in any substantial way of any provisions of the Contract Documents.
- B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:
1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion);
  2. 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
  3. complete the Work as Owner may deem expedient.
- C. If Owner proceeds as provided in Paragraph 15.02.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 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) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed 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.

- D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.
- E. 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. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.
- F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B and 15.02.C.

#### 15.03 *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;
  - 3. 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) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
  - 4. reasonable expenses directly attributable to termination.
- B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

#### 15.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) 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 15.03.

- 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 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 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 16 – DISPUTE RESOLUTION**

### *16.01 Methods and Procedures*

- A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.
- B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.
- C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:
  - 1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions; or
  - 2. agrees with the other party to submit the Claim to another dispute resolution process; or
  - 3. gives written notice to the other party of the intent to submit the Claim to a court of competent jurisdiction.

## **ARTICLE 17 – MISCELLANEOUS**

### *17.01 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 to the individual or to a member of the firm or to an officer of the corporation for whom it is intended; or
2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

#### 17.02 *Computation of Times*

- A. When any period of time is referred to in the Contract Documents 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.

#### 17.03 *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 Documents. 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.

#### 17.04 *Survival of Obligations*

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

#### 17.05 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

#### 17.06 *Headings*

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





## SECTION 00800

### SUPPLEMENTARY CONDITIONS

#### PART 1 AMENDMENTS TO GENERAL CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC C-700, 2007 Edition) and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions have the meanings indicated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings indicated below, which are applicable to both the singular and plural thereof.

The address system used in the Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

#### ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC-1.01 Delete paragraph 1.01A.42 in its entirety and insert the following in its place:

42. Specifications – Sections included under Division 1 through Division 16 of the Project Manual.

SC-1.01 Add the following language at the end of the first sentence of paragraph 1.01A.44:

or has been completed except for work having a contract price of less than one percent of the then adjusted total Contract Price.

#### ARTICLE 2 – PRELIMINARY MATTERS

SC-2.01B Delete paragraph 2.01B in its entirety and insert the following in its place:

2.01B Evidence of Insurance: Within 15 days from the date of the Notice of Award, Contractor shall deliver to Owner, with a copy to Engineer, certificates of insurance (and other evidence requested by Owner) which Contractor is required to purchase and maintain in accordance with the requirements of Article 5.

SC-2.03A Delete paragraph 2.03A in its entirety and insert the following in its place:

2.03A Contract Time will commence to run on the date specified in the Notice to Proceed.

#### ARTICLE 3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

SC-3.01B Add the following new paragraph immediately after paragraph 3.01B:

- 3.01B.1 Each and every provision of law and clause required by law to be inserted in these Contract Documents shall be deemed to be inserted herein, and they shall be read and enforced as though it were included herein, and if through mistake or otherwise, any such provision is not inserted, or if not correctly inserted, then upon the application of either party, the Contract Documents shall forthwith be physically amended to make such insertion.

ARTICLE 4 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

SC-4.03B Amend paragraph 4.03B by striking out the following:

(with a copy to Contractor)

SC-4.03C Add the following new paragraph immediately after paragraph 4.03C.3:

- 4.03C.4 Adjustment resulting from subsurface or latent physical conditions will be in accordance with Massachusetts General Law Chapter 30, Section 39N referenced in Part II of the Supplementary Conditions.

ARTICLE 5 - BONDS AND INSURANCE

SC-5.02A Add the following at the end of paragraph 5.02A:

Surety and insurance companies shall be rated B+ or higher by A. M. Best at the time of contract award.

SC-5.03B Add the following new paragraph immediately after paragraph 5.03E:

5.03F Insurance certificate(s) shall also contain the following:

1. Clarification regarding whether the General Liability policy covers all of the Contractor's operations or only the Work under this contract, with project specific limits.
2. Confirmation that the General Liability policy includes XCU coverage.
3. Confirmation that Automobile insurance covers all Scheduled, Hired and Non-Owned vehicles.
4. Names of all additional insureds as specified herein.

SC-5.04B Add the following new paragraph immediately after paragraph 5.04B6

- 5.04C The limits of liability for the insurance required by paragraph 5.04 shall provide coverage for not less than the following amounts or greater where required by law:

1. Worker's Compensation and Employer's Liability as required by law.
  
2. Contractor's General Liability under paragraphs 5.04A.3 through A.6 of the General Conditions which shall include completed operations and product liability coverages:
  - a. General Aggregate \$2,000,000
  - b. Products/Completed Operations Aggregate \$2,000,000
  - c. Personal and Advertising Injury \$1,000,000
  - d. Each Occurrence (Bodily Injury and Property Damage) \$1,000,000
  - e. Damage to Rented Premises \$500,000
  - f. Excess or Umbrella Liability, which may be used to satisfy the limits of liability required for the insurance to be purchased and maintained in accordance with paragraph 5.04
    - 1) General Aggregate \$2,000,000
    - 2) Each Occurrence \$2,000,000
  
3. Comprehensive Automobile Liability under paragraph 5.04A.6 of the General Conditions including all scheduled, hired and non-owned vehicles:
  - a. Bodily Injury :
 

Each Person	\$1,000,000
Each Accident	\$1,000,000
  - b. Property Damage:
 

Each Accident	\$1,000,000
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4. The following shall be included on the policy and identified on the certificate as additional insureds:



Attn: Chad Thompson, Procurement Manager  
Purchasing Department  
Town of Longmeadow  
735 Longmeadow Street, Suite 101  
Longmeadow, MA 01106

DPC Engineering, LLC  
22 Northfield Road  
Longmeadow, MA 01106

SC-5.05 Delete paragraph 5.05 in its entirety and insert the following in its place:

5.05 Contractor shall purchase and maintain a separate Owner's Protective Liability policy, issued to Owner at the expense of Contractor, including Owner and Engineer as named insured. This insurance shall provide coverage for not less than the following amounts:

Bodily Injury	\$1,000,000 Each Occurrence
Property Damage	\$1,000,000 Each Occurrence \$2,000,000 Aggregate

SC-5.06 Delete the first sentence of paragraph 5.06.A and replace with the following:

Contractor shall purchase and maintain property insurance upon the Work at the Site, in the amount of the full replacement cost thereof. Contractor shall be responsible for any deductible or self-insured retention.

SC-5.06A.1 Delete paragraph 5.06A.1 in its entirety and insert the following in its place:

5.06A.1. include the interests of Owner, Contractor, Subcontractors and Engineer and officers, directors, members, partners, employees, agents and other consultants and subcontractors of any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or loss payee;

SC-5.06A Add the following new paragraph immediately after paragraph 5.06A.7:

5.06A.8. comply with the requirements of paragraph 5.06C. of the General Conditions.

SC-5.06 Delete paragraph 5.06B in its entirety.

SC-5.06 Delete paragraph 5.06E in its entirety.

SC-5.08 Delete paragraph 5.08 in its entirety.

## ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

SC-6.01B Add the following new paragraph immediately after paragraph 6.01B.

6.01C Whenever Owner shall notify Contractor in writing that any person on the Work appears to be incompetent, disorderly, or otherwise unsatisfactory, such person shall be removed from the Project and shall not again be employed on it except with the consent of Owner.

SC-6.06 Delete paragraphs 6.06A and 6.06B in their entirety and insert the following in their place.

6.06A Contractor shall not employ any Subcontractor, Supplier or other person or organization, (including those who are to furnish the principal items of materials or equipment), whether initially or as a substitute, against whom Owner may have reasonable objection. Acceptance of any Subcontractor, other person or organization by Owner shall not constitute a waiver of any right of Owner to reject defective Work. Contractor shall not be required to employ any Subcontractor, other person or organization against whom Contractor has reasonable objection.

SC-6.06C Add the following language at the end of paragraph 6.06C:

Contractor shall make payments to Subcontractors in accordance with Massachusetts General Law Chapter 30, Section 39F which is referenced in PART II of these Supplementary Conditions.

SC-6.06C Add the following new paragraph immediately after paragraph 6.06C.2:

6.06C.3 Owner or Engineer may furnish to any such Subcontractor, Supplier or other person or organization, to the extent practicable, information about amounts paid on their behalf to Contractor in accordance with Contractor's Applications for Payment.

SC-6.07B Delete paragraph 6.07B in its entirety.

SC-6.08 Delete the word "Owner" in the last sentence of Paragraph 6.08A and replace with the word "Contractor."

SC-6.08 Add the following new paragraph immediately after paragraph SC-6.08A:

6.08B The Owner has obtained the following permits and approvals for the Project. The Contractor is required to comply with the permit provisions. Copies of the permits are appended to this section.

A. Town of Longmeadow Conservation Commission Order of Conditions

SC-6.09 Add the following new paragraph immediately after paragraph 6.09C.

6.09D Contractor shall comply with all applicable provisions of Chapter 30, Section 39R of the Massachusetts General Laws regarding Contractor's records.

SC-6.10 Add the following sentence at the end of paragraph 6.10.A.

All materials provided under this Contract are exempt from the Sales and Use Taxes of the Commonwealth of Massachusetts. The tax exemption number will be provided to the Contractor.

SC-6.17 Add the following new paragraphs immediately after paragraph 6.17E:

F. Contractor shall furnish required submittals with sufficient information and accuracy in order to obtain required approval of an item with no more than three submittals. Engineer will record Engineer's time for reviewing subsequent submittals of Shop Drawings, samples, or other items requiring approval and Contractor shall reimburse Owner for Engineer's charges for such time.

G. In the event that Contractor requests a change of a previously approved item, Contractor shall reimburse Owner for Engineer's charges for its review time unless the need for such change is beyond the control of the Contractor.

SC-6.20C Add the following new paragraph immediately after paragraph 6.20.C.

6.20D If, through acts of neglect on the part of Contractor, any other Contractor or any Subcontractor shall suffer loss or damage on the Work, Contractor shall settle with such other Contractor or Subcontractor by agreement or arbitration if such other Contractor or Subcontractor will so settle. If such other Contractor or Subcontractor shall assert any claim against Owner on account of any such damage alleged to have been sustained, Owner shall notify Contractor, who shall indemnify, defend, and save harmless Owner against any such claim.

## ARTICLE 7 - OTHER WORK AT THE SITE

## ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

SC-10.05 Amend the first sentence of paragraph 10.05B by replacing "30 days" with "15 days".

Amend the second sentence of paragraph 10.05B by replacing "60 days" with "30 days".

## ARTICLE 11 - COST OF THE WORK; CASH ALLOWANCES; UNIT PRICE WORK

SC-11.01 Delete paragraph 11.01A.5.c in its entirety and replace with the following:

11.01A.5.c The fair rental of all machinery and equipment used on the extra work for the period of such use. The fair rental for all machinery and equipment shall be based upon the most recent edition of "Rental Rate Bluebook for Construction Equipment" (the "Bluebook"), published by Nielson/Dataquest, or a similar publication approved by Engineer. Rental periods corresponding to the overall period of use shall be used, except if a piece of equipment used on extra work is already on the job, or has previously been rented for a long period of time (months), then the long-term rental rate (monthly) shall be used in determining costs.

SC-11.01B.1 Insert in the first sentence after the word "architects" the word "superintendents".

SC-11.01B.5 Add the following new paragraph immediately after paragraph 11.01B.5:

11.01B.6 Costs of or rental of small tools; costs of or rental of buildings.

## ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

SC-13.03 Insert after the word "notice" the words "(minimum 24 hours)" in paragraph 13.03A.

SC-13.04 Insert in the first sentence of paragraph 13.04B after the word "others" the words "following prior written concurrence of Engineer to cover such work".

SC-13.05 Add the following new paragraph immediately after paragraph 13.05A.

13.05B If Owner stops work under Paragraph 13.05, Contractor shall not be entitled to an extension of Contract Time nor to an increase in Contract Price.

SC-13.06 Add the following new paragraph immediately after Paragraph 13.06B.

13.06C At any time during the progress of the Work, Engineer shall have the right to reject any work which does not conform to the requirements of the Contract Documents, even though such work has been previously inspected and paid for.



## ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

SC-14.02 Delete the first sentence of paragraph 14.02A.1 and replace with the following:

14.02A.1 Engineer will, once in each month, make an estimate in writing of the total value of the work completed as of the date of the Application. Engineer shall review the Application with Contractor and Contractor shall sign the Application.

SC-14.02 Delete paragraph 14.02B.1 in its entirety and insert the following in its place:

14.02B.1 Progress Payments will be made in accordance with Massachusetts General Law Chapter 30, Section 39G, which is referenced in Part II of these Supplementary Conditions.

SC-14.02 Add the following new paragraph immediately after paragraph 14.02B.5.d.

14.02B.5.e Owner is required to pay Engineer additional compensation because of Contractor delays or rejection of defective Work.

SC-14.02 Delete paragraph 14.02C.1 in its entirety and insert the following in its place:

14.02C.1 Progress Payments will be made in accordance with Massachusetts General Law Chapter 30, Section 39G, which is referenced in Part II of these Supplementary Conditions.

SC-14.04 Delete paragraphs 14.04A through 14.04D in their entirety and insert the following in its place:

14.04A 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 (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a Certificate of Substantial Completion. Within a reasonable time thereafter, Owner, Contractor and Engineer shall make an inspection of the Work to determine the status of completion. If, after consultation with Owner, Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor. If, after consultation with Owner, Engineer considers and the Owner agrees that the Work is substantially complete, Engineer will prepare and deliver to Contractor, in a form approved by Owner, a Certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be included in the certificate a list of items to be completed or corrected before final payment.

SC-14.04 Add the following new paragraph immediately after paragraph 14.04A:

14.04A.1 Substantial Completion shall be as defined in Chapter 30, Section 39G of the Massachusetts General Law.

SC-14.05 Add the following new paragraph immediately after paragraph 14.05A.3:

14.05.A.4 Owner may at any time request Contractor in writing to permit Owner to take over operation of any part of the Work although it is not substantially complete. A copy of such request will be sent to Engineer, and within a reasonable time thereafter Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion and will prepare a list of the items remaining to be completed or corrected thereon before final payment. If Contractor does not object in writing to Owner and Engineer that such part of the Work is not ready for separate operation by Owner, Engineer will finalize the list of items to be completed or corrected and will deliver such lists to Owner and Contractor together with a written recommendation as to the division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, maintenance, utilities, insurance, warranties, and guarantees for that part of the Work which will become binding upon Owner and Contractor at the time when Owner takes over such operation (unless they shall have otherwise agreed in writing and so informed Engineer). During such operation and prior to Substantial Completion of such part of the Work, Owner shall allow Contractor reasonable access to complete or correct items on said list and to complete other related Work.

Paragraph 14.05.A.4 shall be renumbered to 14.05.A.5

SC-14.07 Delete paragraphs 14.07.B. and 14.07.C in their entirety and insert the following in their place:

14.07.B 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, all as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract Documents have been fulfilled, Engineer will indicate in writing his/her recommendation of payment and present the Application to Owner for payment. Thereupon Engineer will give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of paragraph 14.09. Otherwise, Engineer will return the Application 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. If the Application and accompanying documentation are appropriate as to form and substance, Owner shall in accordance with the applicable Law, pay Contractor the amount recommended by Engineer.

## ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

SC-15.01 Delete paragraph 15.01.A in its entirety and insert the following in its place:

15.01.A Owner may order, at any time and without cause, suspension of the Work in accordance with Massachusetts General Law Chapter 30, Section 39O, which is referenced in Part II of the Supplementary Conditions.

SC- 15.02 Add the following new paragraph immediately after paragraph 15.02.A.4:

15.02.A.5. If Contractor abandons the Work, or sublets this Contract or any part thereof, without the previous written consent of Owner, or if the Contract or any claim thereunder shall be assigned by Contractor otherwise than as herein specified.

## ARTICLE 16 - DISPUTE RESOLUTION

SC-16.01 Delete paragraph 16.01 in its entirety and insert the following in its place:

16.01.A Subject to the provisions of paragraphs 9.08 and 10.05, Owner and Contractor may exercise such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any dispute.

## ARTICLE 17 - MISCELLANEOUS

SC-17.06 Add the following new paragraphs immediately after paragraph 17.06.

17.07 Wage Rates

- A. The requirements and provisions of all applicable laws and any amendments thereof or additions thereto as to the employment of labor, and to the schedule of minimum wage rates established in compliance with laws shall be a part of these Contract Documents. Copies of the wage schedules are included in Part II of these Supplementary Conditions. If it becomes necessary to employ any person in a trade or occupation not classified in the wage determinations, such person shall be paid at not less than such rates as shall be determined by the officials administering the laws mentioned above. Such approved minimum rate shall be retroactive to the time of the initial employment of such person in such trade or occupation.
- B. The schedules of wages referred to above are minimum rates only, and Owner will not consider any claims for additional compensation made by Contractor because of payment by Contractor of any wage rate in excess of the applicable rate contained in these Contract Documents. All disputes in regard to the payment of wages in excess of those specified in the schedules shall be resolved by Contractor.

- C. The said schedules of wages shall continue to be the minimum rates to be paid during the life of this Agreement and a legible copy of said schedules shall be kept posted in a conspicuous place at the site of the work.

## PART II – FEDERAL AND STATE GOVERNMENT PROVISIONS

Federal and State Government Provisions included herein, have been selected from those to which specific references have been made elsewhere in the Contract Documents. Each and every other provision of law or clause required by law to be inserted in this Contract shall be deemed to be also inserted herein in accordance with paragraph 3.01.B.1 of the Supplementary Conditions.

### 1.0 FEDERAL GOVERNMENT PROVISIONS

Not used

### 2.1 COMMONWEALTH OF MASSACHUSETTS PROVISIONS

2.2 The OWNER and CONTRACTOR agree that the following Commonwealth of Massachusetts Provisions apply to the work to be performed under this Contract and that these provisions supersede any conflicting provisions of this Contract.

2.3 Applicable provisions of Massachusetts General Laws and Regulations and/or the United States Code and Code of Federal Regulations govern this Contract and any provision violation of the foregoing shall be deemed null, void and of no effect.

#### 2.4 Massachusetts General Laws

2.4.1 Chapter 30, Section 39F

2.4.2 Chapter 30, Section 39G

2.4.3 Chapter 30, Section 39I

2.4.4 Chapter 30, Section 39J

2.4.5 Chapter 30, Section 39K

2.4.6 Chapter 30, Section 39L

2.4.7 Chapter 30, Section 39M

2.4.8 Chapter 30, Section 39M1/2

2.4.9 Chapter 30, Section 39N

2.4.10 Chapter 30, Section 39O

2.4.11 Chapter 30, Section 39P

2.4.12 Chapter 30, Section 39Q

2.4.13 Chapter 30, Section 39R

2.4.14 Chapter 30, Section 39S

2.4.15 Chapter 44, Section 31C

2.4.16 Chapter 82 Section 40

2.4.17 Chapter 149, Section 34

2.4.18 Chapter 149, Section 44J

2.5 State Wage Rates

END OF SECTION



CHARLES D. BAKER  
Governor

KARYN E. POLITO  
Lt. Governor

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

**Prevailing Wage Rates**

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

ROSALIN ACOSTA  
Secretary

WILLIAM D MCKINNEY  
Director

**Awarding Authority:** Town of Longmeadow  
**Contract Number:** **City/Town:** LONGMEADOW  
**Description of Work:** IFB Morningside Drive Culvert Replacement Project - REMOVAL AND REPLACEMENT OF UNDERGROUND CULVERT, PAVING, PLUMBING, ELECTRICAL.  
**Job Location:** MORNINGSID DRIVE, LONGMEADOW, MQA

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Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
<b>Construction</b>						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	08/01/2019	\$34.25	\$12.41	\$12.70	\$0.00	\$59.36
	12/01/2019	\$34.25	\$12.41	\$13.72	\$0.00	\$60.38
	06/01/2020	\$35.15	\$12.41	\$13.72	\$0.00	\$61.28
	08/01/2020	\$35.15	\$12.91	\$13.72	\$0.00	\$61.78
	12/01/2020	\$35.15	\$12.91	\$14.82	\$0.00	\$62.88
	06/01/2021	\$35.95	\$12.91	\$14.82	\$0.00	\$63.68
	08/01/2021	\$35.95	\$13.41	\$14.82	\$0.00	\$64.18
	12/01/2021	\$35.95	\$13.41	\$16.01	\$0.00	\$65.37
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	08/01/2019	\$34.32	\$12.41	\$12.70	\$0.00	\$59.43
	12/01/2019	\$34.32	\$12.41	\$13.72	\$0.00	\$60.45
	06/01/2020	\$35.22	\$12.41	\$13.72	\$0.00	\$61.35
	08/01/2020	\$35.22	\$12.91	\$13.72	\$0.00	\$61.85
	12/01/2020	\$35.22	\$12.91	\$14.82	\$0.00	\$62.95
	06/01/2021	\$36.02	\$12.91	\$14.82	\$0.00	\$63.75
	08/01/2021	\$36.02	\$13.41	\$14.82	\$0.00	\$64.25
	12/01/2021	\$36.02	\$13.41	\$16.01	\$0.00	\$65.44
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	08/01/2019	\$34.44	\$12.41	\$12.70	\$0.00	\$59.55
	12/01/2019	\$34.44	\$12.41	\$13.72	\$0.00	\$60.57
	06/01/2020	\$35.34	\$12.41	\$13.72	\$0.00	\$61.47
	08/01/2020	\$35.34	\$12.91	\$13.72	\$0.00	\$61.97
	12/01/2020	\$35.34	\$12.91	\$14.82	\$0.00	\$63.07
	06/01/2021	\$36.14	\$12.91	\$14.82	\$0.00	\$63.87
	08/01/2021	\$36.14	\$13.41	\$14.82	\$0.00	\$64.37
	12/01/2021	\$36.14	\$13.41	\$16.01	\$0.00	\$65.56
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2019	\$102.78	\$9.90	\$21.15	\$0.00	\$133.83
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/03/2019	\$32.25	\$7.85	\$14.22	\$0.00	\$54.32
	12/02/2019	\$33.06	\$7.85	\$14.22	\$0.00	\$55.13
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	06/01/2019	\$32.25	\$7.85	\$12.18	\$0.00	\$52.28
	12/01/2019	\$33.04	\$7.85	\$12.18	\$0.00	\$53.07
	06/01/2020	\$33.85	\$7.85	\$12.18	\$0.00	\$53.88
	12/01/2020	\$34.66	\$7.85	\$12.18	\$0.00	\$54.69
	06/01/2021	\$35.50	\$7.85	\$12.18	\$0.00	\$55.53
	12/01/2021	\$36.33	\$7.85	\$12.18	\$0.00	\$56.36
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS WORKER (PIPES & TANKS) <i>HEAT &amp; FROST INSULATORS LOCAL 6 (SPRINGFIELD)</i>	06/01/2019	\$32.76	\$12.50	\$8.00	\$0.00	\$53.26
	12/01/2019	\$33.66	\$12.50	\$8.00	\$0.00	\$54.16
	06/01/2020	\$34.56	\$12.50	\$8.00	\$0.00	\$55.06
	12/01/2020	\$35.46	\$12.50	\$8.00	\$0.00	\$55.96
ASPHALT RAKER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/03/2019	\$31.75	\$7.85	\$14.22	\$0.00	\$53.82
	12/02/2019	\$32.56	\$7.85	\$14.22	\$0.00	\$54.63
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
ASPHALT RAKER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	06/01/2019	\$31.75	\$7.85	\$12.18	\$0.00	\$51.78
	12/01/2019	\$32.54	\$7.85	\$12.18	\$0.00	\$52.57
	06/01/2020	\$33.35	\$7.85	\$12.18	\$0.00	\$53.38
	12/01/2020	\$34.16	\$7.85	\$12.18	\$0.00	\$54.19
	06/01/2021	\$35.00	\$7.85	\$12.18	\$0.00	\$55.03
	12/01/2021	\$35.83	\$7.85	\$12.18	\$0.00	\$55.86
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
AUTOMATIC GRADER-EXCAVATOR (RECLAIMER) <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$35.05	\$11.69	\$14.08	\$0.00	\$60.82
	12/01/2019	\$35.65	\$11.69	\$14.35	\$0.00	\$61.69
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$35.05	\$11.69	\$14.08	\$0.00	\$60.82
	12/01/2019	\$35.65	\$11.69	\$14.35	\$0.00	\$61.69
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/03/2019	\$31.75	\$7.85	\$14.22	\$0.00	\$53.82
	12/02/2019	\$32.56	\$7.85	\$14.22	\$0.00	\$54.63
For apprentice rates see "Apprentice- LABORER"						
BATCH/CEMENT PLANT - ON SITE <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$34.52	\$11.69	\$14.08	\$0.00	\$60.29
	12/01/2019	\$35.12	\$11.69	\$14.35	\$0.00	\$61.16
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/03/2019	\$32.25	\$7.85	\$14.22	\$0.00	\$54.32
	12/02/2019	\$33.06	\$7.85	\$14.22	\$0.00	\$55.13
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	06/01/2019	\$32.25	\$7.85	\$12.18	\$0.00	\$52.28
	12/01/2019	\$33.04	\$7.85	\$12.18	\$0.00	\$53.07
	06/01/2020	\$33.85	\$7.85	\$12.18	\$0.00	\$53.88
	12/01/2020	\$34.66	\$7.85	\$12.18	\$0.00	\$54.69
	06/01/2021	\$35.50	\$7.85	\$12.18	\$0.00	\$55.53
	12/01/2021	\$36.33	\$7.85	\$12.18	\$0.00	\$56.36
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2019	\$44.71	\$7.07	\$17.72	\$0.00	\$69.50
	01/01/2020	\$46.10	\$7.07	\$17.98	\$0.00	\$71.15



**Apprentice - BOILERMAKER - Local 29**

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

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$29.06	\$7.07	\$11.52	\$0.00	\$47.65
2	65	\$29.06	\$7.07	\$11.52	\$0.00	\$47.65
3	70	\$31.30	\$7.07	\$12.40	\$0.00	\$50.77
4	75	\$33.53	\$7.07	\$13.30	\$0.00	\$53.90
5	80	\$35.77	\$7.07	\$14.18	\$0.00	\$57.02
6	85	\$38.00	\$7.07	\$15.07	\$0.00	\$60.14
7	90	\$40.24	\$7.07	\$15.95	\$0.00	\$63.26
8	95	\$42.47	\$7.07	\$16.84	\$0.00	\$66.38

**Effective Date - 01/01/2020**

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

**Notes:**

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

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING)	08/01/2019	\$42.81	\$10.75	\$19.41	\$0.00	\$72.97
BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)	02/01/2020	\$43.36	\$10.75	\$19.41	\$0.00	\$73.52
	08/01/2020	\$44.71	\$10.75	\$19.56	\$0.00	\$75.02
	02/01/2021	\$45.26	\$10.75	\$19.56	\$0.00	\$75.57
	08/01/2021	\$46.66	\$10.75	\$19.72	\$0.00	\$77.13
	02/01/2022	\$47.19	\$10.75	\$19.72	\$0.00	\$77.66

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Springfield/Pittsfield**

**Effective Date - 08/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.41	\$10.75	\$19.41	\$0.00	\$51.57
2	60	\$25.69	\$10.75	\$19.41	\$0.00	\$55.85
3	70	\$29.97	\$10.75	\$19.41	\$0.00	\$60.13
4	80	\$34.25	\$10.75	\$19.41	\$0.00	\$64.41
5	90	\$38.53	\$10.75	\$19.41	\$0.00	\$68.69

**Effective Date - 02/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.68	\$10.75	\$19.41	\$0.00	\$51.84
2	60	\$26.02	\$10.75	\$19.41	\$0.00	\$56.18
3	70	\$30.35	\$10.75	\$19.41	\$0.00	\$60.51
4	80	\$34.69	\$10.75	\$19.41	\$0.00	\$64.85
5	90	\$39.02	\$10.75	\$19.41	\$0.00	\$69.18

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

BULLDOZER/POWER SHOVEL/TREE SHREDDER /CLAM SHELL OPERATING	06/01/2019	\$35.05	\$11.69	\$14.08	\$0.00	\$60.82
ENGINEERS LOCAL 98 For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2019	\$35.65	\$11.69	\$14.35	\$0.00	\$61.69
CAISSON & UNDERPINNING BOTTOM MAN LABORERS - FOUNDATION AND MARINE	06/01/2019	\$40.25	\$7.85	\$16.05	\$0.00	\$64.15
	12/01/2019	\$41.25	\$7.85	\$16.05	\$0.00	\$65.15
	06/01/2020	\$42.24	\$7.85	\$16.05	\$0.00	\$66.14
	12/01/2020	\$43.22	\$7.85	\$16.05	\$0.00	\$67.12
	06/01/2021	\$44.24	\$7.85	\$16.05	\$0.00	\$68.14
	12/01/2021	\$45.25	\$7.85	\$16.05	\$0.00	\$69.15
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER LABORERS - FOUNDATION AND MARINE	06/01/2019	\$39.10	\$7.85	\$16.05	\$0.00	\$63.00
	12/01/2019	\$40.10	\$7.85	\$16.05	\$0.00	\$64.00
	06/01/2020	\$41.09	\$7.85	\$16.05	\$0.00	\$64.99
	12/01/2020	\$42.07	\$7.85	\$16.05	\$0.00	\$65.97
	06/01/2021	\$43.09	\$7.85	\$16.05	\$0.00	\$66.99
	12/01/2021	\$44.10	\$7.85	\$16.05	\$0.00	\$68.00
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN LABORERS - FOUNDATION AND MARINE	06/01/2019	\$39.10	\$7.85	\$16.05	\$0.00	\$63.00
	12/01/2019	\$40.10	\$7.85	\$16.05	\$0.00	\$64.00
	06/01/2020	\$41.09	\$7.85	\$16.05	\$0.00	\$64.99
	12/01/2020	\$42.07	\$7.85	\$16.05	\$0.00	\$65.97
	06/01/2021	\$43.09	\$7.85	\$16.05	\$0.00	\$66.99
	12/01/2021	\$44.10	\$7.85	\$16.05	\$0.00	\$68.00
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/03/2019	\$31.75	\$7.85	\$14.22	\$0.00	\$53.82
	12/02/2019	\$32.56	\$7.85	\$14.22	\$0.00	\$54.63
For apprentice rates see "Apprentice- LABORER"						
CARPENTER <i>CARPENTERS LOCAL 108 - HAMPDEN HAMPSHIRE FRANKLIN</i>	03/04/2019	\$38.64	\$8.26	\$15.00	\$0.00	\$61.90

**Apprentice - CARPENTER - Local 108 Hampden Hampshire Franklin**

**Effective Date - 03/04/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.32	\$8.26	\$1.22	\$0.00	\$28.80
2	60	\$23.18	\$8.26	\$1.22	\$0.00	\$32.66
3	70	\$27.05	\$8.26	\$11.34	\$0.00	\$46.65
4	75	\$28.98	\$8.26	\$11.34	\$0.00	\$48.58
5	80	\$30.91	\$8.26	\$12.56	\$0.00	\$51.73
6	80	\$30.91	\$8.26	\$12.56	\$0.00	\$51.73
7	90	\$34.78	\$8.26	\$13.78	\$0.00	\$56.82
8	90	\$34.78	\$8.26	\$13.78	\$0.00	\$56.82

**Notes:**

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80  
Step 1&2 \$25.93/ 3&4 \$30.77/ 5&6 \$46.41/ 7&8 \$51.29

**Apprentice to Journeyworker Ratio:1:5**

CARPENTER WOOD FRAME <i>CARPENTERS LOCAL 108 - HAMPDEN HAMPSHIRE FRANKLIN</i>	04/01/2019	\$23.10	\$7.07	\$7.86	\$0.00	\$38.03
	10/01/2019	\$23.49	\$7.07	\$7.86	\$0.00	\$38.42
All Aspects of New Wood Frame Work						

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - CARPENTER (Wood Frame) - 108 Hampden Hampshire**

**Effective Date - 04/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$13.86	\$7.07	\$0.00	\$0.00	\$20.93
2	60	\$13.86	\$7.07	\$0.00	\$0.00	\$20.93
3	65	\$15.02	\$7.07	\$7.86	\$0.00	\$29.95
4	70	\$16.17	\$7.07	\$7.86	\$0.00	\$31.10
5	75	\$17.33	\$7.07	\$7.86	\$0.00	\$32.26
6	80	\$18.48	\$7.07	\$7.86	\$0.00	\$33.41
7	85	\$19.64	\$7.07	\$7.86	\$0.00	\$34.57
8	90	\$20.79	\$7.07	\$7.86	\$0.00	\$35.72

**Effective Date - 10/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$14.09	\$7.07	\$0.00	\$0.00	\$21.16
2	60	\$14.09	\$7.07	\$0.00	\$0.00	\$21.16
3	65	\$15.27	\$7.07	\$7.86	\$0.00	\$30.20
4	70	\$16.44	\$7.07	\$7.86	\$0.00	\$31.37
5	75	\$17.62	\$7.07	\$7.86	\$0.00	\$32.55
6	80	\$18.79	\$7.07	\$7.86	\$0.00	\$33.72
7	85	\$19.97	\$7.07	\$7.86	\$0.00	\$34.90
8	90	\$21.14	\$7.07	\$7.86	\$0.00	\$36.07

**Notes:**  
 % Indentured After 10/1/17; 45/45/55/55/70/70/80/80  
 Step 1&2 \$17.47/ 3&4 \$24.53/ 5&6 \$31.10/ 7&8 \$33.41

**Apprentice to Journeyworker Ratio:1:5**

CEMENT MASONRY/PLASTERING	07/01/2019	\$40.46	\$12.70	\$17.64	\$0.62	\$71.42
BRICKLAYERS LOCAL 3 (SPRINGFIELD/PITTSFIELD)	01/01/2020	\$41.94	\$12.70	\$17.64	\$0.62	\$72.90

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - CEMENT MASONRY/PLASTERING - Springfield/Pittsfield**

**Effective Date - 07/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.23	\$12.70	\$15.41	\$0.00	\$48.34
2	60	\$24.28	\$12.70	\$17.64	\$0.62	\$55.24
3	65	\$26.30	\$12.70	\$17.64	\$0.62	\$57.26
4	70	\$28.32	\$12.70	\$17.64	\$0.62	\$59.28
5	75	\$30.35	\$12.70	\$17.64	\$0.62	\$61.31
6	80	\$32.37	\$12.70	\$17.64	\$0.62	\$63.33
7	90	\$36.41	\$12.70	\$17.64	\$0.62	\$67.37

**Effective Date - 01/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$20.97	\$12.70	\$15.41	\$0.00	\$49.08
2	60	\$25.16	\$12.70	\$17.64	\$0.62	\$56.12
3	65	\$27.26	\$12.70	\$17.64	\$0.62	\$58.22
4	70	\$29.36	\$12.70	\$17.64	\$0.62	\$60.32
5	75	\$31.46	\$12.70	\$17.64	\$0.62	\$62.42
6	80	\$33.55	\$12.70	\$17.64	\$0.62	\$64.51
7	90	\$37.75	\$12.70	\$17.64	\$0.62	\$68.71

**Notes:**

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

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

<b>CHAIN SAW OPERATOR</b> <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/03/2019	\$31.75	\$7.85	\$14.22	\$0.00	\$53.82
For apprentice rates see "Apprentice- LABORER"	12/02/2019	\$32.56	\$7.85	\$14.22	\$0.00	\$54.63
<b>COMPRESSOR OPERATOR</b> <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$34.52	\$11.69	\$14.08	\$0.00	\$60.29
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2019	\$35.12	\$11.69	\$14.35	\$0.00	\$61.16
<b>CRANE OPERATOR</b> <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$38.55	\$11.69	\$14.08	\$0.00	\$64.32
For apprentice rates see "Apprentice- OPERATING ENGINEERS"	12/01/2019	\$39.15	\$11.69	\$14.35	\$0.00	\$65.19
<b>DELEADER (BRIDGE)</b> <i>PAINTERS LOCAL 35 - ZONE 3</i>	07/01/2019	\$50.66	\$8.20	\$21.45	\$0.00	\$80.31
	01/01/2020	\$50.96	\$8.20	\$22.10	\$0.00	\$81.26
	07/01/2020	\$52.06	\$8.20	\$22.10	\$0.00	\$82.36
	01/01/2021	\$53.16	\$8.20	\$22.10	\$0.00	\$83.46

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - PAINTER Local 35 - BRIDGES/TANKS**

**Effective Date - 07/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.33	\$8.20	\$0.00	\$0.00	\$33.53
2	55	\$27.86	\$8.20	\$5.78	\$0.00	\$41.84
3	60	\$30.40	\$8.20	\$6.30	\$0.00	\$44.90
4	65	\$32.93	\$8.20	\$6.83	\$0.00	\$47.96
5	70	\$35.46	\$8.20	\$18.30	\$0.00	\$61.96
6	75	\$38.00	\$8.20	\$18.83	\$0.00	\$65.03
7	80	\$40.53	\$8.20	\$19.35	\$0.00	\$68.08
8	90	\$45.59	\$8.20	\$20.40	\$0.00	\$74.19

**Effective Date - 01/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.48	\$8.20	\$0.00	\$0.00	\$33.68
2	55	\$28.03	\$8.20	\$5.94	\$0.00	\$42.17
3	60	\$30.58	\$8.20	\$6.48	\$0.00	\$45.26
4	65	\$33.12	\$8.20	\$7.02	\$0.00	\$48.34
5	70	\$35.67	\$8.20	\$18.51	\$0.00	\$62.38
6	75	\$38.22	\$8.20	\$19.05	\$0.00	\$65.47
7	80	\$40.77	\$8.20	\$19.59	\$0.00	\$68.56
8	90	\$45.86	\$8.20	\$20.67	\$0.00	\$74.73

**Notes:**

Steps are 750 hrs.

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

DEMO: ADZEMAN LABORERS - ZONE 3 (BUILDING & SITE)	06/01/2019	\$39.30	\$7.85	\$15.85	\$0.00	\$63.00
	12/01/2019	\$40.30	\$7.85	\$15.85	\$0.00	\$64.00

For apprentice rates see "Apprentice- LABORER"

DEMO: BACKHOE/LOADER/HAMMER OPERATOR LABORERS - ZONE 3 (BUILDING & SITE)	06/01/2019	\$40.30	\$7.85	\$15.85	\$0.00	\$64.00
	12/01/2019	\$41.30	\$7.85	\$15.85	\$0.00	\$65.00

For apprentice rates see "Apprentice- LABORER"

DEMO: BURNERS LABORERS - ZONE 3 (BUILDING & SITE)	06/01/2019	\$40.05	\$7.85	\$15.85	\$0.00	\$63.75
	12/01/2019	\$41.05	\$7.85	\$15.85	\$0.00	\$64.75

For apprentice rates see "Apprentice- LABORER"

DEMO: CONCRETE CUTTER/SAWYER LABORERS - ZONE 3 (BUILDING & SITE)	06/01/2019	\$40.30	\$7.85	\$15.85	\$0.00	\$64.00
	12/01/2019	\$41.30	\$7.85	\$15.85	\$0.00	\$65.00

For apprentice rates see "Apprentice- LABORER"

DEMO: JACKHAMMER OPERATOR LABORERS - ZONE 3 (BUILDING & SITE)	06/01/2019	\$40.05	\$7.85	\$15.85	\$0.00	\$63.75
	12/01/2019	\$41.05	\$7.85	\$15.85	\$0.00	\$64.75

For apprentice rates see "Apprentice- LABORER"

DEMO: WRECKING LABORER LABORERS - ZONE 3 (BUILDING & SITE)	06/01/2019	\$39.30	\$7.85	\$15.85	\$0.00	\$63.00
	12/01/2019	\$40.30	\$7.85	\$15.85	\$0.00	\$64.00

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DIVER <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2019	\$68.52	\$9.90	\$21.15	\$0.00	\$99.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2019	\$48.94	\$9.90	\$21.15	\$0.00	\$79.99
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2019	\$73.41	\$9.90	\$21.15	\$0.00	\$104.46
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2019	\$102.78	\$9.90	\$21.15	\$0.00	\$133.83
For apprentice rates see "Apprentice- PILE DRIVER"						
ELECTRICIAN (Including Core Drilling) <i>ELECTRICIANS LOCAL 7</i>	06/30/2019	\$42.66	\$10.75	\$12.33	\$0.00	\$65.74
	12/29/2019	\$43.41	\$11.00	\$12.60	\$0.00	\$67.01

**Apprentice - ELECTRICIAN - Local 7**

**Effective Date - 06/30/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$17.06	\$5.85	\$0.51	\$0.00	\$23.42
2	45	\$19.20	\$5.85	\$0.58	\$0.00	\$25.63
3	50	\$21.33	\$10.75	\$6.94	\$0.00	\$39.02
4	55	\$23.46	\$10.75	\$7.00	\$0.00	\$41.21
5	65	\$27.73	\$10.75	\$8.13	\$0.00	\$46.61
6	70	\$29.86	\$10.75	\$9.20	\$0.00	\$49.81

**Notes:**

Steps 1-2 are 1000 hrs; Steps 3-6 are 1500 hrs.

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

ELEVATOR CONSTRUCTOR <i>ELEVATOR CONSTRUCTORS LOCAL 41</i>	01/01/2019	\$53.11	\$15.58	\$17.51	\$0.00	\$86.20
	01/01/2020	\$54.85	\$15.73	\$18.41	\$0.00	\$88.99
	01/01/2021	\$56.69	\$15.88	\$19.31	\$0.00	\$91.88
	01/01/2022	\$58.62	\$16.03	\$20.21	\$0.00	\$94.86

**Apprentice - ELEVATOR CONSTRUCTOR - Local 41**

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

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.56	\$15.58	\$0.00	\$0.00	\$42.14
2	55	\$29.21	\$15.58	\$17.51	\$0.00	\$62.30
3	65	\$34.52	\$15.58	\$17.51	\$0.00	\$67.61
4	70	\$37.18	\$15.58	\$17.51	\$0.00	\$70.27
5	80	\$42.49	\$15.58	\$17.51	\$0.00	\$75.58

**Effective Date - 01/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.43	\$15.73	\$0.00	\$0.00	\$43.16
2	55	\$30.17	\$15.73	\$18.41	\$0.00	\$64.31
3	65	\$35.65	\$15.73	\$18.41	\$0.00	\$69.79
4	70	\$38.40	\$15.73	\$18.41	\$0.00	\$72.54
5	80	\$43.88	\$15.73	\$18.41	\$0.00	\$78.02

**Notes:**

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

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

ELEVATOR CONSTRUCTOR HELPER <i>ELEVATOR CONSTRUCTORS LOCAL 41</i>	01/01/2019	\$37.18	\$15.58	\$17.51	\$0.00	\$70.27
	01/01/2020	\$38.40	\$15.73	\$18.41	\$0.00	\$72.54
	01/01/2021	\$39.68	\$15.88	\$19.31	\$0.00	\$74.87
	01/01/2022	\$41.03	\$16.03	\$20.21	\$0.00	\$77.27

For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"

FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	06/01/2019	\$31.75	\$7.85	\$12.18	\$0.00	\$51.78
	12/01/2019	\$32.54	\$7.85	\$12.18	\$0.00	\$52.57
	06/01/2020	\$33.35	\$7.85	\$12.18	\$0.00	\$53.38
	12/01/2020	\$34.16	\$7.85	\$12.18	\$0.00	\$54.19
	06/01/2021	\$35.00	\$7.85	\$12.18	\$0.00	\$55.03
	12/01/2021	\$35.83	\$7.85	\$12.18	\$0.00	\$55.86

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

FIELD ENG.INST/ROD-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/1999	\$18.84	\$4.80	\$4.10	\$0.00	\$27.74
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FIELD ENG.PARTY CHIEF:BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/1999	\$21.33	\$4.80	\$4.10	\$0.00	\$30.23
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FIELD ENG.SURVEY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/1999	\$22.33	\$4.80	\$4.10	\$0.00	\$31.23
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FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 7</i>	06/30/2019	\$42.66	\$10.75	\$12.33	\$0.00	\$65.74
	12/29/2019	\$43.41	\$11.00	\$12.60	\$0.00	\$67.01

For apprentice rates see "Apprentice- ELECTRICIAN"

FIRE ALARM REPAIR / MAINTENANCE <i>LOCAL 7</i> / COMMISSIONING <i>ELECTRICIANS</i>	06/30/2019	\$42.66	\$10.75	\$12.33	\$0.00	\$65.74
	12/29/2019	\$43.41	\$11.00	\$12.60	\$0.00	\$67.01

For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIREMAN	06/01/2019	\$34.52	\$11.69	\$14.08	\$0.00	\$60.29
<i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2019	\$35.12	\$11.69	\$14.35	\$0.00	\$61.16

**Apprentice - OPERATING ENGINEERS - Local 98 Class 3**

**Effective Date - 06/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$20.71	\$11.69	\$14.08	\$0.00	\$46.48
2	70	\$24.16	\$11.69	\$14.08	\$0.00	\$49.93
3	80	\$27.62	\$11.69	\$14.08	\$0.00	\$53.39
4	90	\$31.07	\$11.69	\$14.08	\$0.00	\$56.84

**Effective Date - 12/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$21.07	\$11.69	\$14.35	\$0.00	\$47.11
2	70	\$24.58	\$11.69	\$14.35	\$0.00	\$50.62
3	80	\$28.10	\$11.69	\$14.35	\$0.00	\$54.14
4	90	\$31.61	\$11.69	\$14.35	\$0.00	\$57.65

**Notes:**

Steps 1-2 are 1000 hrs.; Steps 3-4 are 2000 hrs.

**Apprentice to Journeyworker Ratio:1:6**

FLAGGER & SIGNALER (HEAVY & HIGHWAY)	06/01/2019	\$22.50	\$7.85	\$12.18	\$0.00	\$42.53
<i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	12/01/2019	\$23.50	\$7.85	\$12.18	\$0.00	\$43.53
	06/01/2020	\$23.50	\$7.85	\$12.18	\$0.00	\$43.53
	12/01/2020	\$24.50	\$7.85	\$12.18	\$0.00	\$44.53
	06/01/2021	\$24.50	\$7.85	\$12.18	\$0.00	\$44.53
	12/01/2021	\$24.50	\$7.85	\$12.18	\$0.00	\$44.53

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

FLOORCOVERER	03/01/2016	\$32.60	\$8.55	\$14.42	\$0.00	\$55.57
<i>FLOORCOVERERS LOCAL 2168 ZONE III</i>						

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - FLOORCOVERER - Local 2168 Zone III**

**Effective Date - 03/01/2016**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$16.30	\$8.55	\$1.20	\$0.00	\$26.05
2	55	\$17.93	\$8.55	\$1.20	\$0.00	\$27.68
3	60	\$19.56	\$8.55	\$10.82	\$0.00	\$38.93
4	65	\$21.19	\$8.55	\$10.82	\$0.00	\$40.56
5	70	\$22.82	\$8.55	\$12.02	\$0.00	\$43.39
6	75	\$24.45	\$8.55	\$12.02	\$0.00	\$45.02
7	80	\$26.08	\$8.55	\$13.22	\$0.00	\$47.85
8	85	\$27.71	\$8.55	\$13.22	\$0.00	\$49.48

**Notes:** Steps are 750 hrs.  
 % After 09/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)  
 Step 1&2 \$24.42/ 3&4 \$28.84/ 5&6 \$43.39/ 7&8 \$47.85

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

<b>FORK LIFT</b>	06/01/2019	\$34.74	\$11.69	\$14.08	\$0.00	\$60.51
<i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2019	\$35.34	\$11.69	\$14.35	\$0.00	\$61.38
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
<b>GENERATORS/LIGHTING PLANTS</b>	06/01/2019	\$31.29	\$11.69	\$14.08	\$0.00	\$57.06
<i>OPERATING ENGINEERS LOCAL 98</i>	12/01/2019	\$31.89	\$11.69	\$14.35	\$0.00	\$57.93
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
<b>GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS)</b>	06/01/2019	\$38.18	\$10.60	\$9.90	\$0.00	\$58.68
<i>GLAZIERS LOCAL 1333</i>	06/01/2020	\$39.18	\$10.80	\$10.45	\$0.00	\$60.43

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - GLAZIER - Local 1333**

**Effective Date - 06/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.09	\$10.60	\$1.80	\$0.00	\$31.49
2	56	\$21.48	\$10.60	\$1.80	\$0.00	\$33.88
3	63	\$23.86	\$10.60	\$2.40	\$0.00	\$36.86
4	69	\$26.25	\$10.60	\$2.40	\$0.00	\$39.25
5	75	\$28.64	\$10.60	\$2.90	\$0.00	\$42.14
6	81	\$31.02	\$10.60	\$2.90	\$0.00	\$44.52
7	88	\$33.41	\$10.60	\$9.90	\$0.00	\$53.91
8	94	\$35.79	\$10.60	\$9.90	\$0.00	\$56.29

**Effective Date - 06/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.59	\$10.80	\$1.80	\$0.00	\$32.19
2	56	\$22.04	\$10.80	\$1.80	\$0.00	\$34.64
3	63	\$24.49	\$10.80	\$2.45	\$0.00	\$37.74
4	69	\$26.94	\$10.80	\$2.45	\$0.00	\$40.19
5	75	\$29.39	\$10.80	\$3.15	\$0.00	\$43.34
6	81	\$31.83	\$10.80	\$3.15	\$0.00	\$45.78
7	88	\$34.28	\$10.80	\$10.45	\$0.00	\$55.53
8	94	\$36.73	\$10.80	\$10.45	\$0.00	\$57.98

**Notes:**

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

GRADER/TRENCHING MACHINE/DERRICK <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$35.05	\$11.69	\$14.08	\$0.00	\$60.82
	12/01/2019	\$35.65	\$11.69	\$14.35	\$0.00	\$61.69
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
HVAC (DUCTWORK) <i>SHEETMETAL WORKERS LOCAL 63</i>	07/01/2019	\$35.74	\$10.64	\$16.22	\$1.77	\$64.37
	01/01/2020	\$36.99	\$10.64	\$16.22	\$1.77	\$65.62
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) <i>ELECTRICIANS LOCAL 7</i>	06/30/2019	\$42.66	\$10.75	\$12.33	\$0.00	\$65.74
	12/29/2019	\$43.41	\$11.00	\$12.60	\$0.00	\$67.01
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) <i>SHEETMETAL WORKERS LOCAL 63</i>	07/01/2019	\$35.74	\$10.64	\$16.22	\$1.77	\$64.37
	01/01/2020	\$36.99	\$10.64	\$16.22	\$1.77	\$65.62
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) <i>PLUMBERS &amp; PIPEFITTERS LOCAL 104</i>	03/17/2019	\$40.21	\$8.75	\$16.35	\$0.00	\$65.31
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC <i>PLUMBERS &amp; PIPEFITTERS LOCAL 104</i>	03/17/2019	\$40.21	\$8.75	\$16.35	\$0.00	\$65.31
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HYDRAULIC DRILLS (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	06/01/2019	\$32.25	\$7.85	\$12.18	\$0.00	\$52.28
	12/01/2019	\$33.04	\$7.85	\$12.18	\$0.00	\$53.07
	06/01/2020	\$33.85	\$7.85	\$12.18	\$0.00	\$53.88
	12/01/2020	\$34.66	\$7.85	\$12.18	\$0.00	\$54.69
	06/01/2021	\$35.50	\$7.85	\$12.18	\$0.00	\$55.53
	12/01/2021	\$36.33	\$7.85	\$12.18	\$0.00	\$56.36
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
INSULATOR (PIPES & TANKS) <i>HEAT &amp; FROST INSULATORS LOCAL 6 (SPRINGFIELD)</i>	09/01/2018	\$37.67	\$12.50	\$15.60	\$0.00	\$65.77
	09/01/2019	\$39.67	\$12.50	\$15.60	\$0.00	\$67.77

**Apprentice - ASBESTOS INSULATOR (Pipes & Tanks) - Local 6 Springfield**

**Effective Date - 09/01/2018**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$18.84	\$12.50	\$11.40	\$0.00	\$42.74
2	60	\$22.60	\$12.50	\$12.24	\$0.00	\$47.34
3	70	\$26.37	\$12.50	\$13.08	\$0.00	\$51.95
4	80	\$30.14	\$12.50	\$13.92	\$0.00	\$56.56

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

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$19.84	\$12.50	\$11.40	\$0.00	\$43.74
2	60	\$23.80	\$12.50	\$12.24	\$0.00	\$48.54
3	70	\$27.77	\$12.50	\$13.08	\$0.00	\$53.35
4	80	\$31.74	\$12.50	\$13.92	\$0.00	\$58.16

**Notes:**

Steps are 1 year

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

IRONWORKER/WELDER <i>IRONWORKERS LOCAL 7 (SPRINGFIELD AREA)</i>	03/16/2019	\$34.20	\$8.00	\$20.75	\$0.00	\$62.95
	09/16/2019	\$35.10	\$8.00	\$20.75	\$0.00	\$63.85
	03/16/2020	\$35.95	\$8.00	\$20.75	\$0.00	\$64.70
	09/16/2020	\$36.85	\$8.00	\$20.75	\$0.00	\$65.60
	03/16/2021	\$37.70	\$8.00	\$20.75	\$0.00	\$66.45

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - IRONWORKER - Local 7 Springfield**

**Effective Date - 03/16/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$20.52	\$8.00	\$20.75	\$0.00	\$49.27
2	70	\$23.94	\$8.00	\$20.75	\$0.00	\$52.69
3	75	\$25.65	\$8.00	\$20.75	\$0.00	\$54.40
4	80	\$27.36	\$8.00	\$20.75	\$0.00	\$56.11
5	85	\$29.07	\$8.00	\$20.75	\$0.00	\$57.82
6	90	\$30.78	\$8.00	\$20.75	\$0.00	\$59.53

**Effective Date - 09/16/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$21.06	\$8.00	\$20.75	\$0.00	\$49.81
2	70	\$24.57	\$8.00	\$20.75	\$0.00	\$53.32
3	75	\$26.33	\$8.00	\$20.75	\$0.00	\$55.08
4	80	\$28.08	\$8.00	\$20.75	\$0.00	\$56.83
5	85	\$29.84	\$8.00	\$20.75	\$0.00	\$58.59
6	90	\$31.59	\$8.00	\$20.75	\$0.00	\$60.34

**Notes:**

Structural 1:6; Ornamental 1:4

**Apprentice to Journeyworker Ratio:**

JACKHAMMER & PAVING BREAKER OPERATOR LABORERS - ZONE 3 (BUILDING & SITE)	06/03/2019	\$31.75	\$7.85	\$14.22	\$0.00	\$53.82
	12/02/2019	\$32.56	\$7.85	\$14.22	\$0.00	\$54.63
For apprentice rates see "Apprentice- LABORER"						
LABORER LABORERS - ZONE 3 (BUILDING & SITE)	06/03/2019	\$31.50	\$7.85	\$14.22	\$0.00	\$53.57
	12/02/2019	\$32.31	\$7.85	\$14.22	\$0.00	\$54.38

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - LABORER - Zone 3 Building & Site**

**Effective Date - 06/03/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$18.90	\$7.85	\$14.22	\$0.00	\$40.97
2	70	\$22.05	\$7.85	\$14.22	\$0.00	\$44.12
3	80	\$25.20	\$7.85	\$14.22	\$0.00	\$47.27
4	90	\$28.35	\$7.85	\$14.22	\$0.00	\$50.42

**Effective Date - 12/02/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$19.39	\$7.85	\$14.22	\$0.00	\$41.46
2	70	\$22.62	\$7.85	\$14.22	\$0.00	\$44.69
3	80	\$25.85	\$7.85	\$14.22	\$0.00	\$47.92
4	90	\$29.08	\$7.85	\$14.22	\$0.00	\$51.15

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

LABORER (HEAVY & HIGHWAY)	06/01/2019	\$31.50	\$7.85	\$12.18	\$0.00	\$51.53
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/01/2019	\$32.29	\$7.85	\$12.18	\$0.00	\$52.32
	06/01/2020	\$33.10	\$7.85	\$12.18	\$0.00	\$53.13
	12/01/2020	\$33.91	\$7.85	\$12.18	\$0.00	\$53.94
	06/01/2021	\$34.75	\$7.85	\$12.18	\$0.00	\$54.78
	12/01/2021	\$35.58	\$7.85	\$12.18	\$0.00	\$55.61

**Apprentice - LABORER (Heavy & Highway) - Zone 3**

**Effective Date - 06/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$18.90	\$7.85	\$12.18	\$0.00	\$38.93
2	70	\$22.05	\$7.85	\$12.18	\$0.00	\$42.08
3	80	\$25.20	\$7.85	\$12.18	\$0.00	\$45.23
4	90	\$28.35	\$7.85	\$12.18	\$0.00	\$48.38

**Effective Date - 12/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$19.37	\$7.85	\$12.18	\$0.00	\$39.40
2	70	\$22.60	\$7.85	\$12.18	\$0.00	\$42.63
3	80	\$25.83	\$7.85	\$12.18	\$0.00	\$45.86
4	90	\$29.06	\$7.85	\$12.18	\$0.00	\$49.09

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

<b>Classification</b>	<b>Effective Date</b>	<b>Base Wage</b>	<b>Health</b>	<b>Pension</b>	<b>Supplemental Unemployment</b>	<b>Total Rate</b>
LABORER: CARPENTER TENDER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/03/2019	\$31.50	\$7.85	\$14.22	\$0.00	\$53.57
	12/02/2019	\$32.31	\$7.85	\$14.22	\$0.00	\$54.38
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/03/2019	\$31.75	\$7.85	\$14.22	\$0.00	\$53.82
	12/02/2019	\$32.56	\$7.85	\$14.22	\$0.00	\$54.63
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/01/2019	\$31.60	\$7.85	\$14.22	\$0.00	\$53.67
	12/01/2019	\$32.41	\$7.85	\$14.22	\$0.00	\$54.48
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/03/2019	\$32.50	\$7.85	\$14.22	\$0.00	\$54.57
	12/02/2019	\$33.31	\$7.85	\$14.22	\$0.00	\$55.38
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	06/01/2019	\$31.75	\$7.85	\$12.18	\$0.00	\$51.78
	12/01/2019	\$32.54	\$7.85	\$12.18	\$0.00	\$52.57
	06/01/2020	\$33.35	\$7.85	\$12.18	\$0.00	\$53.38
	12/01/2020	\$34.16	\$7.85	\$12.18	\$0.00	\$54.19
	06/01/2021	\$35.00	\$7.85	\$12.18	\$0.00	\$55.03
	12/01/2021	\$35.83	\$7.85	\$12.18	\$0.00	\$55.86
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
LABORER: MULTI-TRADE TENDER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/03/2019	\$31.50	\$7.85	\$14.22	\$0.00	\$53.57
	12/02/2019	\$32.31	\$7.85	\$14.22	\$0.00	\$54.38
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/03/2019	\$31.50	\$7.85	\$14.22	\$0.00	\$53.57
	12/02/2019	\$32.31	\$7.85	\$14.22	\$0.00	\$54.38
This classification applies to all tree work associated with the removal of standing trees, and trimming and removal of branches and limbs when the work is not done for a utility company for the purpose of operation, maintenance or repair of utility company equipment. For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/03/2019	\$31.75	\$7.85	\$14.22	\$0.00	\$53.82
	12/02/2019	\$32.56	\$7.85	\$14.22	\$0.00	\$54.63
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	06/01/2019	\$31.75	\$7.85	\$12.18	\$0.00	\$51.78
	12/01/2019	\$32.54	\$7.85	\$12.18	\$0.00	\$52.57
	06/01/2020	\$33.35	\$7.85	\$12.18	\$0.00	\$53.38
	12/01/2020	\$34.16	\$7.85	\$12.18	\$0.00	\$54.19
	06/01/2021	\$35.00	\$7.85	\$12.18	\$0.00	\$55.03
	12/01/2021	\$35.83	\$7.85	\$12.18	\$0.00	\$55.86
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS <i>BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE &amp; TILE</i>	08/01/2019	\$35.17	\$10.75	\$18.87	\$0.00	\$64.79
	02/01/2020	\$35.67	\$10.75	\$18.87	\$0.00	\$65.29
	08/01/2020	\$36.67	\$10.75	\$18.99	\$0.00	\$66.41
	02/01/2021	\$37.17	\$10.75	\$18.99	\$0.00	\$66.91
	08/01/2021	\$38.17	\$10.75	\$19.12	\$0.00	\$68.04
	02/01/2022	\$38.62	\$10.75	\$19.12	\$0.00	\$68.49

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - MARBLE-TILE FINISHER-Local 3 Marble/Tile (Spr/Pitt)**

**Effective Date - 08/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.59	\$10.75	\$18.87	\$0.00	\$47.21
2	60	\$21.10	\$10.75	\$18.87	\$0.00	\$50.72
3	70	\$24.62	\$10.75	\$18.87	\$0.00	\$54.24
4	80	\$28.14	\$10.75	\$18.87	\$0.00	\$57.76
5	90	\$31.65	\$10.75	\$18.87	\$0.00	\$61.27

**Effective Date - 02/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.84	\$10.75	\$18.87	\$0.00	\$47.46
2	60	\$21.40	\$10.75	\$18.87	\$0.00	\$51.02
3	70	\$24.97	\$10.75	\$18.87	\$0.00	\$54.59
4	80	\$28.54	\$10.75	\$18.87	\$0.00	\$58.16
5	90	\$32.10	\$10.75	\$18.87	\$0.00	\$61.72

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

MARBLE MASON/TILE LAYER(SP/PT)SeeBrick  
BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE

See "BRICK/STONE/ARTIFICIAL MASONRY(INCL.MASONRY WATERPROOFING)

MECH. SWEEPER OPERATOR (ON CONST. SITES) OPERATING ENGINEERS LOCAL 98	06/01/2019	\$35.05	\$11.69	\$14.08	\$0.00	\$60.82
	12/01/2019	\$35.65	\$11.69	\$14.35	\$0.00	\$61.69

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MECHANIC/WELDER/BOOM TRUCK OPERATING ENGINEERS LOCAL 98	06/01/2019	\$34.52	\$11.69	\$14.08	\$0.00	\$60.29
	12/01/2019	\$35.12	\$11.69	\$14.35	\$0.00	\$61.16

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MILLWRIGHT (Zone 3) MILLWRIGHTS LOCAL 1121 - Zone 3	04/01/2019	\$37.11	\$9.90	\$18.50	\$0.00	\$65.51
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**Apprentice - MILLWRIGHT - Local 1121 Zone 3**

**Effective Date - 04/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$20.41	\$9.90	\$5.31	\$0.00	\$35.62
2	65	\$24.12	\$9.90	\$15.13	\$0.00	\$49.15
3	75	\$27.83	\$9.90	\$16.10	\$0.00	\$53.83
4	85	\$31.54	\$9.90	\$17.06	\$0.00	\$58.50

**Notes:**

Steps are 2,000 hours

**Apprentice to Journeyworker Ratio:1:5**



Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
MORTAR MIXER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/03/2019	\$31.75	\$7.85	\$14.22	\$0.00	\$53.82
	12/02/2019	\$32.56	\$7.85	\$14.22	\$0.00	\$54.63
For apprentice rates see "Apprentice- LABORER"						
OILER <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$30.21	\$11.69	\$14.08	\$0.00	\$55.98
	12/01/2019	\$30.81	\$11.69	\$14.35	\$0.00	\$56.85
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS VI <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$28.23	\$11.69	\$14.08	\$0.00	\$54.00
	12/01/2019	\$28.83	\$11.69	\$14.35	\$0.00	\$54.87
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) <i>PAINTERS LOCAL 35 - ZONE 3</i>	07/01/2019	\$50.66	\$8.20	\$21.45	\$0.00	\$80.31
	01/01/2020	\$50.96	\$8.20	\$22.10	\$0.00	\$81.26
	07/01/2020	\$52.06	\$8.20	\$22.10	\$0.00	\$82.36
	01/01/2021	\$53.16	\$8.20	\$22.10	\$0.00	\$83.46

**Apprentice - PAINTER Local 35 - BRIDGES/TANKS**

**Effective Date - 07/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.33	\$8.20	\$0.00	\$0.00	\$33.53
2	55	\$27.86	\$8.20	\$5.78	\$0.00	\$41.84
3	60	\$30.40	\$8.20	\$6.30	\$0.00	\$44.90
4	65	\$32.93	\$8.20	\$6.83	\$0.00	\$47.96
5	70	\$35.46	\$8.20	\$18.30	\$0.00	\$61.96
6	75	\$38.00	\$8.20	\$18.83	\$0.00	\$65.03
7	80	\$40.53	\$8.20	\$19.35	\$0.00	\$68.08
8	90	\$45.59	\$8.20	\$20.40	\$0.00	\$74.19

**Effective Date - 01/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.48	\$8.20	\$0.00	\$0.00	\$33.68
2	55	\$28.03	\$8.20	\$5.94	\$0.00	\$42.17
3	60	\$30.58	\$8.20	\$6.48	\$0.00	\$45.26
4	65	\$33.12	\$8.20	\$7.02	\$0.00	\$48.34
5	70	\$35.67	\$8.20	\$18.51	\$0.00	\$62.38
6	75	\$38.22	\$8.20	\$19.05	\$0.00	\$65.47
7	80	\$40.77	\$8.20	\$19.59	\$0.00	\$68.56
8	90	\$45.86	\$8.20	\$20.67	\$0.00	\$74.73

**Notes:**

Steps are 750 hrs.

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

PAINTER (SIGN, PICTORIAL & DISPLAY) <i>PAINTERS LOCAL 35 - ZONE 3</i>	06/01/2013	\$25.81	\$7.07	\$7.05	\$0.00	\$39.93
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**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - PAINTER SIGN - Local 35 Zone 3**

**Effective Date - 06/01/2013**

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

**Notes:**  
Steps are 4 mos.

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

PAINTER (SPRAY OR SANDBLAST, NEW) *	07/01/2019	\$34.03	\$8.20	\$17.55	\$0.00	\$59.78
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 3	01/01/2020	\$34.33	\$8.20	\$18.20	\$0.00	\$60.73
	07/01/2020	\$35.43	\$8.20	\$18.20	\$0.00	\$61.83
	01/01/2021	\$36.53	\$8.20	\$18.20	\$0.00	\$62.93

**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - PAINTER Local 35 Zone 3 - Spray/Sandblast - New**

**Effective Date - 07/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.02	\$8.20	\$0.00	\$0.00	\$25.22
2	55	\$18.72	\$8.20	\$3.63	\$0.00	\$30.55
3	60	\$20.42	\$8.20	\$3.96	\$0.00	\$32.58
4	65	\$22.12	\$8.20	\$4.29	\$0.00	\$34.61
5	70	\$23.82	\$8.20	\$15.57	\$0.00	\$47.59
6	75	\$25.52	\$8.20	\$15.90	\$0.00	\$49.62
7	80	\$27.22	\$8.20	\$16.23	\$0.00	\$51.65
8	90	\$30.63	\$8.20	\$16.89	\$0.00	\$55.72

**Effective Date - 01/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$17.17	\$8.20	\$0.00	\$0.00	\$25.37
2	55	\$18.88	\$8.20	\$3.80	\$0.00	\$30.88
3	60	\$20.60	\$8.20	\$4.14	\$0.00	\$32.94
4	65	\$22.31	\$8.20	\$4.49	\$0.00	\$35.00
5	70	\$24.03	\$8.20	\$15.78	\$0.00	\$48.01
6	75	\$25.75	\$8.20	\$16.13	\$0.00	\$50.08
7	80	\$27.46	\$8.20	\$16.47	\$0.00	\$52.13
8	90	\$30.90	\$8.20	\$17.16	\$0.00	\$56.26

**Notes:**  
Steps are 750 hrs.

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

PAINTER (SPRAY OR SANDBLAST, REPAINT)	07/01/2019	\$31.35	\$8.20	\$17.55	\$0.00	\$57.10
PAINTERS LOCAL 35 - ZONE 3	01/01/2020	\$31.65	\$8.20	\$18.20	\$0.00	\$58.05
	07/01/2020	\$32.75	\$8.20	\$18.20	\$0.00	\$59.15
	01/01/2021	\$33.85	\$8.20	\$18.20	\$0.00	\$60.25

**Apprentice - PAINTER Local 35 Zone 3 - Spray/Sandblast - Repaint**

**Effective Date - 07/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$15.68	\$8.20	\$0.00	\$0.00	\$23.88
2	55	\$17.24	\$8.20	\$3.63	\$0.00	\$29.07
3	60	\$18.81	\$8.20	\$3.96	\$0.00	\$30.97
4	65	\$20.38	\$8.20	\$4.29	\$0.00	\$32.87
5	70	\$21.95	\$8.20	\$15.57	\$0.00	\$45.72
6	75	\$23.51	\$8.20	\$15.90	\$0.00	\$47.61
7	80	\$25.08	\$8.20	\$16.23	\$0.00	\$49.51
8	90	\$28.22	\$8.20	\$16.89	\$0.00	\$53.31

**Effective Date - 01/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$15.83	\$8.20	\$0.00	\$0.00	\$24.03
2	55	\$17.41	\$8.20	\$3.80	\$0.00	\$29.41
3	60	\$18.99	\$8.20	\$4.14	\$0.00	\$31.33
4	65	\$20.57	\$8.20	\$4.49	\$0.00	\$33.26
5	70	\$22.16	\$8.20	\$15.78	\$0.00	\$46.14
6	75	\$23.74	\$8.20	\$16.13	\$0.00	\$48.07
7	80	\$25.32	\$8.20	\$16.47	\$0.00	\$49.99
8	90	\$28.49	\$8.20	\$17.16	\$0.00	\$53.85

**Notes:**  
Steps are 750 hrs.

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

PAINTER / TAPER (BRUSH, NEW) *	07/01/2019	\$32.63	\$8.20	\$17.55	\$0.00	\$58.38
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 3	01/01/2020	\$32.93	\$8.20	\$18.20	\$0.00	\$59.33
	07/01/2020	\$34.03	\$8.20	\$18.20	\$0.00	\$60.43
	01/01/2021	\$35.13	\$8.20	\$18.20	\$0.00	\$61.53

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - PAINTER - Local 35 Zone 3 - BRUSH NEW**

**Effective Date - 07/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$16.32	\$8.20	\$0.00	\$0.00	\$24.52
2	55	\$17.95	\$8.20	\$3.63	\$0.00	\$29.78
3	60	\$19.58	\$8.20	\$3.96	\$0.00	\$31.74
4	65	\$21.21	\$8.20	\$4.29	\$0.00	\$33.70
5	70	\$22.84	\$8.20	\$15.57	\$0.00	\$46.61
6	75	\$24.47	\$8.20	\$15.90	\$0.00	\$48.57
7	80	\$26.10	\$8.20	\$16.23	\$0.00	\$50.53
8	90	\$29.37	\$8.20	\$16.89	\$0.00	\$54.46

**Effective Date - 01/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$16.47	\$8.20	\$0.00	\$0.00	\$24.67
2	55	\$18.11	\$8.20	\$3.80	\$0.00	\$30.11
3	60	\$19.76	\$8.20	\$4.14	\$0.00	\$32.10
4	65	\$21.40	\$8.20	\$4.49	\$0.00	\$34.09
5	70	\$23.05	\$8.20	\$15.78	\$0.00	\$47.03
6	75	\$24.70	\$8.20	\$16.13	\$0.00	\$49.03
7	80	\$26.34	\$8.20	\$16.47	\$0.00	\$51.01
8	90	\$29.64	\$8.20	\$17.16	\$0.00	\$55.00

**Notes:**  
Steps are 750 hrs.

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

PAINTER / TAPER (BRUSH, REPAINT)	07/01/2019	\$29.95	\$8.20	\$17.55	\$0.00	\$55.70
PAINTERS LOCAL 35 - ZONE 3	01/01/2020	\$30.25	\$8.20	\$18.20	\$0.00	\$56.65
	07/01/2020	\$31.35	\$8.20	\$18.20	\$0.00	\$57.75
	01/01/2021	\$32.45	\$8.20	\$18.20	\$0.00	\$58.85

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - PAINTER Local 35 Zone 3 - BRUSH REPAINT**

**Effective Date - 07/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$14.98	\$8.20	\$0.00	\$0.00	\$23.18
2	55	\$16.47	\$8.20	\$3.63	\$0.00	\$28.30
3	60	\$17.97	\$8.20	\$3.96	\$0.00	\$30.13
4	65	\$19.47	\$8.20	\$4.29	\$0.00	\$31.96
5	70	\$20.97	\$8.20	\$15.57	\$0.00	\$44.74
6	75	\$22.46	\$8.20	\$15.90	\$0.00	\$46.56
7	80	\$23.96	\$8.20	\$16.23	\$0.00	\$48.39
8	90	\$26.96	\$8.20	\$16.89	\$0.00	\$52.05

**Effective Date - 01/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$15.13	\$8.20	\$0.00	\$0.00	\$23.33
2	55	\$16.64	\$8.20	\$3.80	\$0.00	\$28.64
3	60	\$18.15	\$8.20	\$4.14	\$0.00	\$30.49
4	65	\$19.66	\$8.20	\$4.49	\$0.00	\$32.35
5	70	\$21.18	\$8.20	\$15.78	\$0.00	\$45.16
6	75	\$22.69	\$8.20	\$16.13	\$0.00	\$47.02
7	80	\$24.20	\$8.20	\$16.47	\$0.00	\$48.87
8	90	\$27.23	\$8.20	\$17.16	\$0.00	\$52.59

**Notes:**

Steps are 750 hrs.

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

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY)	06/01/2019	\$31.50	\$7.85	\$12.18	\$0.00	\$51.53
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/01/2019	\$32.29	\$7.85	\$12.18	\$0.00	\$52.32
	06/01/2020	\$33.10	\$7.85	\$12.18	\$0.00	\$53.13
	12/01/2020	\$33.91	\$7.85	\$12.18	\$0.00	\$53.94
	06/01/2021	\$34.75	\$7.85	\$12.18	\$0.00	\$54.78
	12/01/2021	\$35.58	\$7.85	\$12.18	\$0.00	\$55.61

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)

PANEL & PICKUP TRUCKS DRIVER	08/01/2019	\$34.08	\$12.41	\$12.70	\$0.00	\$59.19
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/01/2019	\$34.08	\$12.41	\$13.72	\$0.00	\$60.21
	06/01/2020	\$34.98	\$12.41	\$13.72	\$0.00	\$61.11
	08/01/2020	\$34.98	\$12.91	\$13.72	\$0.00	\$61.61
	12/01/2020	\$34.98	\$12.91	\$14.82	\$0.00	\$62.71
	06/01/2021	\$35.78	\$12.91	\$14.82	\$0.00	\$63.51
	08/01/2021	\$35.78	\$13.41	\$14.82	\$0.00	\$64.01
	12/01/2021	\$35.78	\$13.41	\$16.01	\$0.00	\$65.20

PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK)	08/01/2019	\$43.79	\$9.90	\$21.15	\$0.00	\$74.84
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PILE DRIVER LOCAL 56 (ZONE 3)

For apprentice rates see "Apprentice- PILE DRIVER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PILE DRIVER <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2019	\$43.79	\$9.90	\$21.15	\$0.00	\$74.84

**Apprentice - PILE DRIVER - Local 56 Zone 3**

**Effective Date - 08/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	0	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

**Notes:** Apprentice wages shall be no less than the following Steps;  
(Same as set in Zone 1)  
1\$54.34/2\$58.99/3\$63.65/4\$65.98/5\$68.31/6\$68.31/7\$72.96/8\$72.96

**Apprentice to Journeyworker Ratio:1:5**

PIPELAYER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/03/2019	\$31.75	\$7.85	\$14.22	\$0.00	\$53.82
	12/02/2019	\$32.56	\$7.85	\$14.22	\$0.00	\$54.63

For apprentice rates see "Apprentice- LABORER"

PIPELAYER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	06/01/2019	\$31.75	\$7.85	\$12.18	\$0.00	\$51.78
	12/01/2019	\$32.54	\$7.85	\$12.18	\$0.00	\$52.57
	06/01/2020	\$33.35	\$7.85	\$12.18	\$0.00	\$53.38
	12/01/2020	\$34.16	\$7.85	\$12.18	\$0.00	\$54.19
	06/01/2021	\$35.00	\$7.85	\$12.18	\$0.00	\$55.03
	12/01/2021	\$35.83	\$7.85	\$12.18	\$0.00	\$55.86

For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"

PLUMBER & PIPEFITTER <i>PLUMBERS &amp; PIPEFITTERS LOCAL 104</i>	03/17/2019	\$40.21	\$8.75	\$16.35	\$0.00	\$65.31
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**Apprentice - PLUMBER/PIPEFITTER - Local 104**

**Effective Date - 03/17/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$18.09	\$8.75	\$9.60	\$0.00	\$36.44
2	50	\$20.11	\$8.75	\$9.60	\$0.00	\$38.46
3	55	\$22.12	\$8.75	\$9.60	\$0.00	\$40.47
4	60	\$24.13	\$8.75	\$9.60	\$0.00	\$42.48
5	65	\$26.14	\$8.75	\$9.60	\$0.00	\$44.49
6	70	\$28.15	\$8.75	\$9.60	\$0.00	\$46.50
7	75	\$30.16	\$8.75	\$9.60	\$0.00	\$48.51
8	80	\$32.17	\$8.75	\$9.60	\$0.00	\$50.52
9	80	\$32.17	\$8.75	\$16.35	\$0.00	\$57.27
10	80	\$32.17	\$8.75	\$16.35	\$0.00	\$57.27

**Notes: \*\*1:1,2:5,3:9,4:12**

**Apprentice to Journeyworker Ratio:\*\***

PNEUMATIC CONTROLS (TEMP.) <i>PLUMBERS &amp; PIPEFITTERS LOCAL 104</i>	03/17/2019	\$40.21	\$8.75	\$16.35	\$0.00	\$65.31
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For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	06/01/2019	\$31.75	\$7.85	\$12.18	\$0.00	\$51.78
	12/01/2019	\$32.54	\$7.85	\$12.18	\$0.00	\$52.57
	06/01/2020	\$33.35	\$7.85	\$12.18	\$0.00	\$53.38
	12/01/2020	\$34.16	\$7.85	\$12.18	\$0.00	\$54.19
	06/01/2021	\$35.00	\$7.85	\$12.18	\$0.00	\$55.03
	12/01/2021	\$35.83	\$7.85	\$12.18	\$0.00	\$55.86
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
POWDERMAN & BLASTER <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/03/2019	\$32.50	\$7.85	\$14.22	\$0.00	\$54.57
	12/02/2019	\$33.31	\$7.85	\$14.22	\$0.00	\$55.38
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	06/01/2019	\$32.50	\$7.85	\$12.18	\$0.00	\$52.53
	12/01/2019	\$33.29	\$7.85	\$12.18	\$0.00	\$53.32
	06/01/2020	\$34.10	\$7.85	\$12.18	\$0.00	\$54.13
	12/01/2020	\$34.91	\$7.85	\$12.18	\$0.00	\$54.94
	06/01/2021	\$35.75	\$7.85	\$12.18	\$0.00	\$55.78
	12/01/2021	\$36.58	\$7.85	\$12.18	\$0.00	\$56.61
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$35.05	\$11.69	\$14.08	\$0.00	\$60.82
	12/01/2019	\$35.65	\$11.69	\$14.35	\$0.00	\$61.69
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$34.52	\$11.69	\$14.08	\$0.00	\$60.29
	12/01/2019	\$35.12	\$11.69	\$14.35	\$0.00	\$61.16
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS 404 - Construction Service (Northampton)</i>	05/01/2016	\$20.54	\$10.57	\$8.39	\$0.00	\$39.50
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/03/2019	\$31.75	\$7.85	\$14.22	\$0.00	\$53.82
	12/02/2019	\$32.56	\$7.85	\$14.22	\$0.00	\$54.63
For apprentice rates see "Apprentice- LABORER"						
ROLLER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$33.91	\$11.69	\$14.08	\$0.00	\$59.68
	12/01/2019	\$34.51	\$11.69	\$14.35	\$0.00	\$60.55
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Coal tar pitch) <i>ROOFERS LOCAL 248</i>	07/16/2019	\$32.66	\$10.05	\$16.20	\$0.00	\$58.91
For apprentice rates see "Apprentice- ROOFER"						
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg) <i>ROOFERS LOCAL 248</i>	07/16/2019	\$32.16	\$10.05	\$15.70	\$0.00	\$57.91



**Classification**

**Effective Date    Base Wage    Health    Pension    Supplemental Unemployment    Total Rate**

**Apprentice - ROOFER - Local 248**

**Effective Date - 07/16/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$19.30	\$10.05	\$0.00	\$0.00	\$29.35
2	65	\$20.90	\$10.05	\$15.70	\$0.00	\$46.65
3	70	\$22.51	\$10.05	\$15.70	\$0.00	\$48.26
4	75	\$24.12	\$10.05	\$15.70	\$0.00	\$49.87
5	80	\$25.73	\$10.05	\$15.70	\$0.00	\$51.48
6	85	\$27.34	\$10.05	\$15.70	\$0.00	\$53.09
7	90	\$28.94	\$10.05	\$15.70	\$0.00	\$54.69
8	95	\$30.55	\$10.05	\$15.70	\$0.00	\$56.30

**Notes:**

Steps are 750 hrs.Roofer(Tear Off)1:1; Same as above

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

ROOFER SLATE / TILE / PRECAST CONCRETE <i>ROOFERS LOCAL 248</i>	07/16/2019	\$32.66	\$10.05	\$16.20	\$0.00	\$58.91
For apprentice rates see "Apprentice- ROOFER"						
SCRAPER <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$34.52	\$11.69	\$14.08	\$0.00	\$60.29
	12/01/2019	\$35.12	\$11.69	\$14.35	\$0.00	\$61.16
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SELF-POWERED ROLLERS AND COMPACTORS (TAMPERS) <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$33.91	\$11.69	\$14.08	\$0.00	\$59.68
	12/01/2019	\$34.51	\$11.69	\$14.35	\$0.00	\$60.55
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SELF-PROPELLED POWER BROOM <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$31.29	\$11.69	\$14.08	\$0.00	\$57.06
	12/01/2019	\$31.89	\$11.69	\$14.35	\$0.00	\$57.93
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SHEETMETAL WORKER <i>SHEETMETAL WORKERS LOCAL 63</i>	07/01/2019	\$35.74	\$10.64	\$16.22	\$1.77	\$64.37
	01/01/2020	\$36.99	\$10.64	\$16.22	\$1.77	\$65.62

**Apprentice - SHEET METAL WORKER - Local 63**

**Effective Date - 07/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$16.08	\$6.21	\$4.67	\$0.00	\$26.96
2	50	\$17.87	\$6.55	\$5.19	\$0.00	\$29.61
3	55	\$19.66	\$6.88	\$9.33	\$1.08	\$36.95
4	60	\$21.44	\$7.22	\$9.33	\$1.14	\$39.13
5	65	\$23.23	\$7.55	\$9.33	\$1.20	\$41.31
6	70	\$25.02	\$7.88	\$9.33	\$1.27	\$43.50
7	75	\$26.81	\$8.22	\$9.33	\$1.33	\$45.69
8	80	\$28.59	\$9.30	\$15.18	\$1.59	\$54.66
9	85	\$30.38	\$9.64	\$15.18	\$1.66	\$56.86
10	90	\$32.17	\$9.98	\$15.18	\$1.72	\$59.05

**Effective Date - 01/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$16.65	\$6.21	\$4.67	\$0.00	\$27.53
2	50	\$18.50	\$6.55	\$5.19	\$0.00	\$30.24
3	55	\$20.34	\$6.88	\$9.33	\$1.08	\$37.63
4	60	\$22.19	\$7.22	\$9.33	\$1.14	\$39.88
5	65	\$24.04	\$7.55	\$9.33	\$1.20	\$42.12
6	70	\$25.89	\$7.88	\$9.33	\$1.27	\$44.37
7	75	\$27.74	\$8.22	\$9.33	\$1.33	\$46.62
8	80	\$29.59	\$9.30	\$15.18	\$1.59	\$55.66
9	85	\$31.44	\$9.64	\$15.18	\$1.66	\$57.92
10	90	\$33.29	\$9.98	\$15.18	\$1.72	\$60.17

**Notes:**

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP < 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	08/01/2019	\$34.54	\$12.41	\$12.70	\$0.00	\$59.65
	12/01/2019	\$34.54	\$12.41	\$13.72	\$0.00	\$60.67
	06/01/2020	\$35.44	\$12.41	\$13.72	\$0.00	\$61.57
	08/01/2020	\$35.44	\$12.91	\$13.72	\$0.00	\$62.07
	12/01/2020	\$35.44	\$12.91	\$14.82	\$0.00	\$63.17
	06/01/2021	\$36.24	\$12.91	\$14.82	\$0.00	\$63.97
	08/01/2021	\$36.24	\$13.41	\$14.82	\$0.00	\$64.47
	12/01/2021	\$36.24	\$13.41	\$16.01	\$0.00	\$65.66

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	08/01/2019	\$34.83	\$12.41	\$12.70	\$0.00	\$59.94
	12/01/2019	\$34.83	\$12.41	\$13.72	\$0.00	\$60.96
	06/01/2020	\$35.73	\$12.41	\$13.72	\$0.00	\$61.86
	08/01/2020	\$35.73	\$12.91	\$13.72	\$0.00	\$62.36
	12/01/2020	\$35.73	\$12.91	\$14.82	\$0.00	\$63.46
	06/01/2021	\$36.53	\$12.91	\$14.82	\$0.00	\$64.26
	08/01/2021	\$36.53	\$13.41	\$14.82	\$0.00	\$64.76
	12/01/2021	\$36.53	\$13.41	\$16.01	\$0.00	\$65.95
SPRINKLER FITTER <i>SPRINKLER FITTERS LOCAL 669</i>	01/01/2019	\$41.51	\$10.02	\$13.08	\$0.00	\$64.61

**Apprentice - SPRINKLER FITTER - Local 669**

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

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$18.68	\$7.75	\$0.00	\$0.00	\$26.43
2	50	\$20.76	\$7.75	\$0.00	\$0.00	\$28.51
3	55	\$22.83	\$10.02	\$7.25	\$0.00	\$40.10
4	60	\$24.91	\$10.02	\$7.25	\$0.00	\$42.18
5	65	\$26.98	\$10.02	\$7.50	\$0.00	\$44.50
6	70	\$29.06	\$10.02	\$7.50	\$0.00	\$46.58
7	75	\$31.13	\$10.02	\$7.50	\$0.00	\$48.65
8	80	\$33.21	\$10.02	\$7.50	\$0.00	\$50.73
9	85	\$35.28	\$10.02	\$7.50	\$0.00	\$52.80
10	90	\$37.36	\$10.02	\$7.50	\$0.00	\$54.88

**Notes:**

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

TELECOMMUNICATION TECHNICIAN <i>ELECTRICIANS LOCAL 7</i>	06/30/2019	\$42.66	\$10.75	\$12.33	\$0.00	\$65.74
	12/29/2019	\$43.41	\$11.00	\$12.60	\$0.00	\$67.01

**Apprentice - TELECOMMUNICATION TECHNICIAN - Local 7**

**Effective Date - 06/30/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$17.06	\$5.85	\$0.51	\$0.00	\$23.42
2	45	\$19.20	\$5.85	\$0.58	\$0.00	\$25.63
3	50	\$21.33	\$10.75	\$6.94	\$0.00	\$39.02
4	55	\$23.46	\$10.75	\$7.00	\$0.00	\$41.21
5	65	\$27.73	\$10.75	\$8.13	\$0.00	\$46.61
6	70	\$29.86	\$10.75	\$9.20	\$0.00	\$49.81

**Notes:**

Steps are 800 hours

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

TERRAZZO FINISHERS BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE & TILE	08/01/2019	\$53.34	\$10.75	\$21.30	\$0.00	\$85.39
	02/01/2020	\$53.98	\$10.75	\$21.30	\$0.00	\$86.03
	08/01/2020	\$55.33	\$10.75	\$21.45	\$0.00	\$87.53
	02/01/2021	\$55.97	\$10.75	\$21.45	\$0.00	\$88.17
	08/01/2021	\$57.37	\$10.75	\$21.61	\$0.00	\$89.73
	02/01/2022	\$57.96	\$10.75	\$21.61	\$0.00	\$90.32

**Apprentice - TERRAZZO FINISHER-Local 3 Marble/Tile (Spr/Ptt)**

**Effective Date - 08/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.67	\$10.75	\$21.30	\$0.00	\$58.72
2	60	\$32.00	\$10.75	\$21.30	\$0.00	\$64.05
3	70	\$37.34	\$10.75	\$21.30	\$0.00	\$69.39
4	80	\$42.67	\$10.75	\$21.30	\$0.00	\$74.72
5	90	\$48.01	\$10.75	\$21.30	\$0.00	\$80.06

**Effective Date - 02/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$26.99	\$10.75	\$21.30	\$0.00	\$59.04
2	60	\$32.39	\$10.75	\$21.30	\$0.00	\$64.44
3	70	\$37.79	\$10.75	\$21.30	\$0.00	\$69.84
4	80	\$43.18	\$10.75	\$21.30	\$0.00	\$75.23
5	90	\$48.58	\$10.75	\$21.30	\$0.00	\$80.63

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TERRAZZO MECHANIC <i>BRICKLAYERS LOCAL 3 (SPR/PITT) - MARBLE &amp; TILE</i>	08/01/2019	\$54.42	\$10.75	\$21.30	\$0.00	\$86.47
	02/01/2020	\$55.05	\$10.75	\$21.30	\$0.00	\$87.10
	08/01/2020	\$56.40	\$10.75	\$21.45	\$0.00	\$88.60
	02/01/2021	\$57.04	\$10.75	\$21.45	\$0.00	\$89.24
	08/01/2021	\$58.44	\$10.75	\$21.61	\$0.00	\$90.80
	02/01/2022	\$59.01	\$10.75	\$21.61	\$0.00	\$91.37

**Apprentice - TERRAZZO MECH - Local 3 Marble/Tile (Spr/Pitt)**

**Effective Date - 08/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.21	\$10.75	\$21.30	\$0.00	\$59.26
2	60	\$32.65	\$10.75	\$21.30	\$0.00	\$64.70
3	70	\$38.09	\$10.75	\$21.30	\$0.00	\$70.14
4	80	\$43.54	\$10.75	\$21.30	\$0.00	\$75.59
5	90	\$48.98	\$10.75	\$21.30	\$0.00	\$81.03

**Effective Date - 02/01/2020**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.53	\$10.75	\$21.30	\$0.00	\$59.58
2	60	\$33.03	\$10.75	\$21.30	\$0.00	\$65.08
3	70	\$38.54	\$10.75	\$21.30	\$0.00	\$70.59
4	80	\$44.04	\$10.75	\$21.30	\$0.00	\$76.09
5	90	\$49.55	\$10.75	\$21.30	\$0.00	\$81.60

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

TEST BORING DRILLER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2019	\$40.50	\$7.85	\$16.05	\$0.00	\$64.40
	12/01/2019	\$41.50	\$7.85	\$16.05	\$0.00	\$65.40
	06/01/2020	\$42.49	\$7.85	\$16.05	\$0.00	\$66.39
	12/01/2020	\$43.47	\$7.85	\$16.05	\$0.00	\$67.37
	06/01/2021	\$44.49	\$7.85	\$16.05	\$0.00	\$68.39
	12/01/2021	\$45.50	\$7.85	\$16.05	\$0.00	\$69.40

For apprentice rates see "Apprentice- LABORER"

TEST BORING DRILLER HELPER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2019	\$39.22	\$7.85	\$16.05	\$0.00	\$63.12
	12/01/2019	\$40.22	\$7.85	\$16.05	\$0.00	\$64.12
	06/01/2020	\$41.21	\$7.85	\$16.05	\$0.00	\$65.11
	12/01/2020	\$42.19	\$7.85	\$16.05	\$0.00	\$66.09
	06/01/2021	\$43.21	\$7.85	\$16.05	\$0.00	\$67.11
	12/01/2021	\$44.22	\$7.85	\$16.05	\$0.00	\$68.12

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TEST BORING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2019	\$39.10	\$7.85	\$16.05	\$0.00	\$63.00
	12/01/2019	\$40.10	\$7.85	\$16.05	\$0.00	\$64.00
	06/01/2020	\$41.09	\$7.85	\$16.05	\$0.00	\$64.99
	12/01/2020	\$42.07	\$7.85	\$16.05	\$0.00	\$65.97
	06/01/2021	\$43.09	\$7.85	\$16.05	\$0.00	\$66.99
	12/01/2021	\$44.10	\$7.85	\$16.05	\$0.00	\$68.00
For apprentice rates see "Apprentice- LABORER"						
TRACTORS <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$33.91	\$11.69	\$14.08	\$0.00	\$59.68
	12/01/2019	\$34.51	\$11.69	\$14.35	\$0.00	\$60.55
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	08/01/2019	\$35.12	\$12.41	\$12.70	\$0.00	\$60.23
	12/01/2019	\$35.12	\$12.41	\$13.72	\$0.00	\$61.25
	06/01/2020	\$36.02	\$12.41	\$13.72	\$0.00	\$62.15
	08/01/2020	\$36.02	\$12.91	\$13.72	\$0.00	\$62.65
	12/01/2020	\$36.02	\$12.91	\$14.82	\$0.00	\$63.75
	06/01/2021	\$36.82	\$12.91	\$14.82	\$0.00	\$64.55
	08/01/2021	\$36.82	\$13.41	\$14.82	\$0.00	\$65.05
	12/01/2021	\$36.82	\$13.41	\$16.01	\$0.00	\$66.24
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	06/01/2019	\$51.38	\$7.85	\$16.45	\$0.00	\$75.68
	12/01/2019	\$52.38	\$7.85	\$16.45	\$0.00	\$76.68
	06/01/2020	\$53.37	\$7.85	\$16.45	\$0.00	\$77.67
	12/01/2020	\$54.35	\$7.85	\$16.45	\$0.00	\$78.65
	06/01/2021	\$55.37	\$7.85	\$16.45	\$0.00	\$79.67
	12/01/2021	\$56.38	\$7.85	\$16.45	\$0.00	\$80.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	06/01/2019	\$53.38	\$7.85	\$16.45	\$0.00	\$77.68
	12/01/2019	\$54.38	\$7.85	\$16.45	\$0.00	\$78.68
	06/01/2020	\$55.37	\$7.85	\$16.45	\$0.00	\$79.67
	12/01/2020	\$56.35	\$7.85	\$16.45	\$0.00	\$80.65
	06/01/2021	\$57.37	\$7.85	\$16.45	\$0.00	\$81.67
	12/01/2021	\$58.38	\$7.85	\$16.45	\$0.00	\$82.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	06/01/2019	\$43.45	\$7.85	\$16.45	\$0.00	\$67.75
	12/01/2019	\$44.45	\$7.85	\$16.45	\$0.00	\$68.75
	06/01/2020	\$45.44	\$7.85	\$16.45	\$0.00	\$69.74
	12/01/2020	\$46.42	\$7.85	\$16.45	\$0.00	\$70.72
	06/01/2021	\$47.44	\$7.85	\$16.45	\$0.00	\$71.74
	12/01/2021	\$48.45	\$7.85	\$16.45	\$0.00	\$72.75
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	06/01/2019	\$45.45	\$7.85	\$16.45	\$0.00	\$69.75
	12/01/2019	\$46.45	\$7.85	\$16.45	\$0.00	\$70.75
	06/01/2020	\$47.44	\$7.85	\$16.45	\$0.00	\$71.74
	12/01/2020	\$48.42	\$7.85	\$16.45	\$0.00	\$72.72
	06/01/2021	\$49.44	\$7.85	\$16.45	\$0.00	\$73.74
	12/01/2021	\$50.45	\$7.85	\$16.45	\$0.00	\$74.75
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	08/01/2019	\$34.54	\$12.41	\$12.70	\$0.00	\$59.65
	12/01/2019	\$34.54	\$12.41	\$13.72	\$0.00	\$60.67
	06/01/2020	\$35.44	\$12.41	\$13.72	\$0.00	\$61.57
	08/01/2020	\$35.44	\$12.91	\$13.72	\$0.00	\$62.07
	12/01/2020	\$35.44	\$12.91	\$14.82	\$0.00	\$63.17
	06/01/2021	\$36.24	\$12.91	\$14.82	\$0.00	\$63.97
	08/01/2021	\$36.24	\$13.41	\$14.82	\$0.00	\$64.47
	12/01/2021	\$36.24	\$13.41	\$16.01	\$0.00	\$65.66
WAGON DRILL OPERATOR <i>LABORERS - ZONE 3 (BUILDING &amp; SITE)</i>	06/03/2019	\$31.75	\$7.85	\$14.22	\$0.00	\$53.82
	12/02/2019	\$32.56	\$7.85	\$14.22	\$0.00	\$54.63
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 3 (HEAVY &amp; HIGHWAY)</i>	06/01/2019	\$31.75	\$7.85	\$12.18	\$0.00	\$51.78
	12/01/2019	\$32.54	\$7.85	\$12.18	\$0.00	\$52.57
	06/01/2020	\$33.35	\$7.85	\$12.18	\$0.00	\$53.38
	12/01/2020	\$34.16	\$7.85	\$12.18	\$0.00	\$54.19
	06/01/2021	\$35.00	\$7.85	\$12.18	\$0.00	\$55.03
	12/01/2021	\$35.83	\$7.85	\$12.18	\$0.00	\$55.86
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WATER METER INSTALLER <i>PLUMBERS &amp; PIPEFITTERS LOCAL 104</i>	03/17/2019	\$40.21	\$8.75	\$16.35	\$0.00	\$65.31
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
<b>Outside Electrical - West</b>						
EQUIPMENT OPERATOR <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	09/02/2018	\$42.26	\$8.00	\$12.50	\$0.00	\$62.76
	09/01/2019	\$44.67	\$8.00	\$12.55	\$0.00	\$65.22
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	09/02/2018	\$28.17	\$8.00	\$5.41	\$0.00	\$41.58
	09/01/2019	\$30.58	\$8.00	\$5.48	\$0.00	\$44.06
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN / TRUCK DRIVER <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	09/02/2018	\$37.56	\$8.00	\$10.89	\$0.00	\$56.45
	09/01/2019	\$39.97	\$8.00	\$10.96	\$0.00	\$58.93
For apprentice rates see "Apprentice- LINEMAN"						
HEAVY EQUIPMENT OPERATOR <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	09/02/2018	\$44.60	\$8.00	\$13.15	\$0.00	\$65.75
	09/01/2019	\$47.01	\$8.00	\$13.22	\$0.00	\$68.23
For apprentice rates see "Apprentice- LINEMAN"						
JOURNEYMAN LINEMAN <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	09/02/2018	\$49.30	\$8.00	\$15.48	\$0.00	\$72.78
	09/01/2019	\$51.71	\$8.00	\$15.55	\$0.00	\$75.26

**Apprentice - LINEMAN (Outside Electrical) - West Local 42**

**Effective Date - 09/02/2018**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$29.58	\$8.00	\$3.39	\$0.00	\$40.97
2	65	\$32.05	\$8.00	\$3.46	\$0.00	\$43.51
3	70	\$34.51	\$8.00	\$3.54	\$0.00	\$46.05
4	75	\$36.98	\$8.00	\$5.11	\$0.00	\$50.09
5	80	\$39.44	\$8.00	\$5.18	\$0.00	\$52.62
6	85	\$41.91	\$8.00	\$5.26	\$0.00	\$55.17
7	90	\$44.37	\$8.00	\$7.33	\$0.00	\$59.70

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

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$31.03	\$8.00	\$3.43	\$0.00	\$42.46
2	65	\$33.61	\$8.00	\$3.51	\$0.00	\$45.12
3	70	\$36.20	\$8.00	\$3.59	\$0.00	\$47.79
4	75	\$38.78	\$8.00	\$5.16	\$0.00	\$51.94
5	80	\$41.37	\$8.00	\$5.24	\$0.00	\$54.61
6	85	\$43.95	\$8.00	\$5.32	\$0.00	\$57.27
7	90	\$46.54	\$8.00	\$7.40	\$0.00	\$61.94

**Notes:**

**Apprentice to Journeyworker Ratio:1:2**

TELEDATA CABLE SPLICER <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	02/04/2019	\$30.73	\$4.70	\$3.17	\$0.00	\$38.60
TELEDATA LINEMAN/EQUIPMENT OPERATOR <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	02/04/2019	\$28.93	\$4.70	\$3.14	\$0.00	\$36.77
TELEDATA WIREMAN/INSTALLER/TECHNICIAN <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	02/04/2019	\$28.93	\$4.70	\$3.14	\$0.00	\$36.77
TRACTOR-TRAILER DRIVER <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	09/02/2018	\$42.26	\$8.00	\$12.50	\$0.00	\$62.76
TREE TRIMMER <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	09/01/2019	\$44.67	\$8.00	\$12.55	\$0.00	\$65.22
TREE TRIMMER <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	01/31/2016	\$18.51	\$3.55	\$0.00	\$0.00	\$22.06

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

TREE TRIMMER GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	01/31/2016	\$16.32	\$3.55	\$0.00	\$0.00	\$19.87
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This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is on the ground. This classification does not apply to wholesale tree removal.

**Rental of Equipment - West**



<b>Classification</b>	<b>Effective Date</b>	<b>Base Wage</b>	<b>Health</b>	<b>Pension</b>	<b>Supplemental Unemployment</b>	<b>Total Rate</b>
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	08/01/2019	\$34.25	\$12.41	\$0.00	\$0.00	\$46.66
	12/01/2019	\$34.25	\$12.41	\$0.00	\$0.00	\$46.66
	06/01/2020	\$35.15	\$12.41	\$0.00	\$0.00	\$47.56
	08/01/2020	\$35.15	\$12.91	\$0.00	\$0.00	\$48.06
	12/01/2020	\$35.15	\$12.91	\$0.00	\$0.00	\$48.06
	06/01/2021	\$35.95	\$12.91	\$0.00	\$0.00	\$48.86
	08/01/2021	\$35.95	\$13.41	\$0.00	\$0.00	\$49.36
	12/01/2021	\$35.95	\$13.41	\$0.00	\$0.00	\$49.36
(3 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	08/01/2019	\$34.32	\$12.41	\$0.00	\$0.00	\$46.73
	12/01/2019	\$34.32	\$12.41	\$0.00	\$0.00	\$46.73
	06/01/2020	\$35.22	\$12.41	\$0.00	\$0.00	\$47.63
	08/01/2020	\$35.22	\$12.91	\$0.00	\$0.00	\$48.13
	12/01/2020	\$35.22	\$12.91	\$0.00	\$0.00	\$48.13
	06/01/2021	\$36.02	\$12.91	\$0.00	\$0.00	\$48.93
	08/01/2021	\$36.02	\$13.41	\$0.00	\$0.00	\$49.43
	12/01/2021	\$36.02	\$13.41	\$0.00	\$0.00	\$49.43
(4 & 5 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	08/01/2019	\$34.44	\$12.41	\$0.00	\$0.00	\$46.85
	12/01/2019	\$34.44	\$12.41	\$0.00	\$0.00	\$46.85
	06/01/2020	\$35.34	\$12.41	\$0.00	\$0.00	\$47.75
	08/01/2020	\$35.34	\$12.91	\$0.00	\$0.00	\$48.25
	12/01/2020	\$35.34	\$12.91	\$0.00	\$0.00	\$48.25
	06/01/2021	\$36.14	\$12.91	\$0.00	\$0.00	\$49.05
	08/01/2021	\$36.14	\$13.41	\$0.00	\$0.00	\$49.55
	12/01/2021	\$36.14	\$13.41	\$0.00	\$0.00	\$49.55
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2019	\$102.78	\$9.90	\$0.00	\$0.00	\$112.68
For apprentice rates see "Apprentice- PILE DRIVER"						
BACKHOE/FRONT-END LOADER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$35.05	\$11.69	\$0.00	\$0.00	\$46.74
	12/01/2019	\$35.65	\$11.69	\$0.00	\$0.00	\$47.34
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BATCH/CEMENT PLANT - ON SITE <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$34.52	\$11.69	\$0.00	\$0.00	\$46.21
	12/01/2019	\$35.12	\$11.69	\$0.00	\$0.00	\$46.81
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BULLDOZER/POWER SHOVEL/TREE SHREDDER <i>ENGINEERS LOCAL 98</i> <i>/CLAM SHELL OPERATING</i>	06/01/2019	\$35.05	\$11.69	\$0.00	\$0.00	\$46.74
	12/01/2019	\$35.65	\$11.69	\$0.00	\$0.00	\$47.34
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$34.52	\$11.69	\$0.00	\$0.00	\$46.21
	12/01/2019	\$35.12	\$11.69	\$0.00	\$0.00	\$46.81
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CRANE OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$38.55	\$11.69	\$0.00	\$0.00	\$50.24
	12/01/2019	\$39.15	\$11.69	\$0.00	\$0.00	\$50.84
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2019	\$68.52	\$9.90	\$0.00	\$0.00	\$78.42
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER <i>PILE DRIVER LOCAL 56 (ZONE 3)</i>	08/01/2019	\$48.94	\$9.90	\$0.00	\$0.00	\$58.84

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) PILE DRIVER LOCAL 56 (ZONE 3)	08/01/2019	\$73.41	\$9.90	\$0.00	\$0.00	\$83.31
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) PILE DRIVER LOCAL 56 (ZONE 3)	08/01/2019	\$102.78	\$9.90	\$0.00	\$0.00	\$112.68
For apprentice rates see "Apprentice- PILE DRIVER"						
FIREMAN OPERATING ENGINEERS LOCAL 98	06/01/2019	\$34.52	\$11.69	\$0.00	\$0.00	\$46.21
	12/01/2019	\$35.12	\$11.69	\$0.00	\$0.00	\$46.81

**Apprentice - OPERATING ENGINEERS - Local 98 Class 3**

**Effective Date - 06/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$20.71	\$11.69	\$0.00	\$0.00	\$32.40
2	70	\$24.16	\$11.69	\$0.00	\$0.00	\$35.85
3	80	\$27.62	\$11.69	\$0.00	\$0.00	\$39.31
4	90	\$31.07	\$11.69	\$0.00	\$0.00	\$42.76

**Effective Date - 12/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$21.07	\$11.69	\$0.00	\$0.00	\$32.76
2	70	\$24.58	\$11.69	\$0.00	\$0.00	\$36.27
3	80	\$28.10	\$11.69	\$0.00	\$0.00	\$39.79
4	90	\$31.61	\$11.69	\$0.00	\$0.00	\$43.30

**Notes:**

Steps 1-2 are 1000 hrs.; Steps 3-4 are 2000 hrs.

**Apprentice to Journeyworker Ratio:1:6**

FLAGGER & SIGNALER (HEAVY & HIGHWAY) LABORERS - ZONE 3 (HEAVY & HIGHWAY)	06/01/2019	\$22.50	\$7.85	\$0.00	\$0.00	\$30.35
	12/01/2019	\$23.50	\$7.85	\$0.00	\$0.00	\$31.35
	06/01/2020	\$23.50	\$7.85	\$0.00	\$0.00	\$31.35
	12/01/2020	\$24.50	\$7.85	\$0.00	\$0.00	\$32.35
	06/01/2021	\$24.50	\$7.85	\$0.00	\$0.00	\$32.35
	12/01/2021	\$24.50	\$7.85	\$0.00	\$0.00	\$32.35
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FORK LIFT/CHERRY PICKER 27F WEST OPERATING ENGINEERS LOCAL 98	06/01/2019	\$34.74	\$11.69	\$0.00	\$0.00	\$46.43
	12/01/2019	\$35.34	\$11.69	\$0.00	\$0.00	\$47.03
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATORS/LIGHTING PLANTS OPERATING ENGINEERS LOCAL 98	06/01/2019	\$31.29	\$11.69	\$0.00	\$0.00	\$42.98
	12/01/2019	\$31.89	\$11.69	\$0.00	\$0.00	\$43.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GRADER/TRENCHING MACHINE/DERRICK OPERATING ENGINEERS LOCAL 98	06/01/2019	\$35.05	\$11.69	\$0.00	\$0.00	\$46.74
	12/01/2019	\$35.65	\$11.69	\$0.00	\$0.00	\$47.34
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
LABORER LABORERS - ZONE 3 (BUILDING & SITE)	06/03/2019	\$31.50	\$7.85	\$0.00	\$0.00	\$39.35
	12/02/2019	\$32.31	\$7.85	\$0.00	\$0.00	\$40.16

**Classification**

**Effective Date   Base Wage   Health   Pension   Supplemental Unemployment   Total Rate**

**Apprentice - LABORER - Zone 3 Building & Site**

**Effective Date - 06/03/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$18.90	\$7.85	\$0.00	\$0.00	\$26.75
2	70	\$22.05	\$7.85	\$0.00	\$0.00	\$29.90
3	80	\$25.20	\$7.85	\$0.00	\$0.00	\$33.05
4	90	\$28.35	\$7.85	\$0.00	\$0.00	\$36.20

**Effective Date - 12/02/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$19.39	\$7.85	\$0.00	\$0.00	\$27.24
2	70	\$22.62	\$7.85	\$0.00	\$0.00	\$30.47
3	80	\$25.85	\$7.85	\$0.00	\$0.00	\$33.70
4	90	\$29.08	\$7.85	\$0.00	\$0.00	\$36.93

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

LABORER (HEAVY & HIGHWAY)	06/01/2019	\$31.50	\$7.85	\$0.00	\$0.00	\$39.35
LABORERS - ZONE 3 (HEAVY & HIGHWAY)	12/01/2019	\$32.29	\$7.85	\$0.00	\$0.00	\$40.14
	06/01/2020	\$33.10	\$7.85	\$0.00	\$0.00	\$40.95
	12/01/2020	\$33.91	\$7.85	\$0.00	\$0.00	\$41.76
	06/01/2021	\$34.75	\$7.85	\$0.00	\$0.00	\$42.60
	12/01/2021	\$35.58	\$7.85	\$0.00	\$0.00	\$43.43

**Apprentice - LABORER (Heavy & Highway) - Zone 3**

**Effective Date - 06/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$18.90	\$7.85	\$0.00	\$0.00	\$26.75
2	70	\$22.05	\$7.85	\$0.00	\$0.00	\$29.90
3	80	\$25.20	\$7.85	\$0.00	\$0.00	\$33.05
4	90	\$28.35	\$7.85	\$0.00	\$0.00	\$36.20

**Effective Date - 12/01/2019**

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$19.37	\$7.85	\$0.00	\$0.00	\$27.22
2	70	\$22.60	\$7.85	\$0.00	\$0.00	\$30.45
3	80	\$25.83	\$7.85	\$0.00	\$0.00	\$33.68
4	90	\$29.06	\$7.85	\$0.00	\$0.00	\$36.91

**Notes:**

**Apprentice to Journeyworker Ratio:1:5**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
MECHANIC/WELDER/BOOM TRUCK <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$34.52	\$11.69	\$0.00	\$0.00	\$46.21
	12/01/2019	\$35.12	\$11.69	\$0.00	\$0.00	\$46.81
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$30.21	\$11.69	\$0.00	\$0.00	\$41.90
	12/01/2019	\$30.81	\$11.69	\$0.00	\$0.00	\$42.50
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS VI <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$28.23	\$11.69	\$0.00	\$0.00	\$39.92
	12/01/2019	\$28.83	\$11.69	\$0.00	\$0.00	\$40.52
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PANEL & PICKUP TRUCKS DRIVER <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	08/01/2019	\$34.08	\$12.41	\$0.00	\$0.00	\$46.49
	12/01/2019	\$34.08	\$12.41	\$0.00	\$0.00	\$46.49
	06/01/2020	\$34.98	\$12.41	\$0.00	\$0.00	\$47.39
	08/01/2020	\$34.98	\$12.91	\$0.00	\$0.00	\$47.89
	12/01/2020	\$34.98	\$12.91	\$0.00	\$0.00	\$47.89
	06/01/2021	\$35.78	\$12.91	\$0.00	\$0.00	\$48.69
	08/01/2021	\$35.78	\$13.41	\$0.00	\$0.00	\$49.19
	12/01/2021	\$35.78	\$13.41	\$0.00	\$0.00	\$49.19
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$35.05	\$11.69	\$0.00	\$0.00	\$46.74
	12/01/2019	\$35.65	\$11.69	\$0.00	\$0.00	\$47.34
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$34.52	\$11.69	\$0.00	\$0.00	\$46.21
	12/01/2019	\$35.12	\$11.69	\$0.00	\$0.00	\$46.81
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROLLER OPERATOR <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$33.91	\$11.69	\$0.00	\$0.00	\$45.60
	12/01/2019	\$34.51	\$11.69	\$0.00	\$0.00	\$46.20
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SCRAPER <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$34.52	\$11.69	\$0.00	\$0.00	\$46.21
	12/01/2019	\$35.12	\$11.69	\$0.00	\$0.00	\$46.81
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SELF-PROPELLED POWER BROOM <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$31.29	\$11.69	\$0.00	\$0.00	\$42.98
	12/01/2019	\$31.89	\$11.69	\$0.00	\$0.00	\$43.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
SPECIALIZED EARTH MOVING EQUIP < 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	08/01/2019	\$34.54	\$12.41	\$0.00	\$0.00	\$46.95
	12/01/2019	\$34.54	\$12.41	\$0.00	\$0.00	\$46.95
	06/01/2020	\$35.44	\$12.41	\$0.00	\$0.00	\$47.85
	08/01/2020	\$35.44	\$12.91	\$0.00	\$0.00	\$48.35
	12/01/2020	\$35.44	\$12.91	\$0.00	\$0.00	\$48.35
	06/01/2021	\$36.24	\$12.91	\$0.00	\$0.00	\$49.15
	08/01/2021	\$36.24	\$13.41	\$0.00	\$0.00	\$49.65
	12/01/2021	\$36.24	\$13.41	\$0.00	\$0.00	\$49.65

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
SPECIALIZED EARTH MOVING EQUIP > 35 TONS <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	08/01/2019	\$34.83	\$12.41	\$0.00	\$0.00	\$47.24
	12/01/2019	\$34.83	\$12.41	\$0.00	\$0.00	\$47.24
	06/01/2020	\$35.73	\$12.41	\$0.00	\$0.00	\$48.14
	08/01/2020	\$35.73	\$12.91	\$0.00	\$0.00	\$48.64
	12/01/2020	\$35.73	\$12.91	\$0.00	\$0.00	\$48.64
	06/01/2021	\$36.53	\$12.91	\$0.00	\$0.00	\$49.44
	08/01/2021	\$36.53	\$13.41	\$0.00	\$0.00	\$49.94
	12/01/2021	\$36.53	\$13.41	\$0.00	\$0.00	\$49.94
TRACTORS <i>OPERATING ENGINEERS LOCAL 98</i>	06/01/2019	\$33.91	\$11.69	\$0.00	\$0.00	\$45.60
	12/01/2019	\$34.51	\$11.69	\$0.00	\$0.00	\$46.20
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	08/01/2019	\$35.12	\$12.41	\$0.00	\$0.00	\$47.53
	12/01/2019	\$35.12	\$12.41	\$0.00	\$0.00	\$47.53
	06/01/2020	\$36.02	\$12.41	\$0.00	\$0.00	\$48.43
	08/01/2020	\$36.02	\$12.91	\$0.00	\$0.00	\$48.93
	12/01/2020	\$36.02	\$12.91	\$0.00	\$0.00	\$48.93
	06/01/2021	\$36.82	\$12.91	\$0.00	\$0.00	\$49.73
	08/01/2021	\$36.82	\$13.41	\$0.00	\$0.00	\$50.23
	12/01/2021	\$36.82	\$13.41	\$0.00	\$0.00	\$50.23
TREE TRIMMER <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	01/31/2016	\$18.51	\$3.55	\$0.00	\$0.00	\$22.06
This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is not on the ground. This classification does not apply to wholesale tree removal.						
TREE TRIMMER GROUNDMAN <i>OUTSIDE ELECTRICAL WORKERS - WEST LOCAL 42</i>	01/31/2016	\$16.32	\$3.55	\$0.00	\$0.00	\$19.87
This classification applies only to tree work done: (a) for a utility company, R.E.A. cooperative, or railroad or coal mining company, and (b) for the purpose of operating, maintaining, or repairing the utility company's equipment, and (c) by a person who is using hand or mechanical cutting methods and is on the ground. This classification does not apply to wholesale tree removal.						
VAC-HAUL/CATCH BASIN CLEANING <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	08/01/2019	\$34.54	\$12.41	\$0.00	\$0.00	\$46.95
	12/01/2019	\$34.54	\$12.41	\$0.00	\$0.00	\$46.95
	06/01/2020	\$35.44	\$12.41	\$0.00	\$0.00	\$47.85
	08/01/2020	\$35.44	\$12.91	\$0.00	\$0.00	\$48.35
	12/01/2020	\$35.44	\$12.91	\$0.00	\$0.00	\$48.35
	06/01/2021	\$36.24	\$12.91	\$0.00	\$0.00	\$49.15
	08/01/2021	\$36.24	\$13.41	\$0.00	\$0.00	\$49.65
	12/01/2021	\$36.24	\$13.41	\$0.00	\$0.00	\$49.65

**Additional Apprentice Information:**

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

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

All steps are six months (1000 hours.)

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

\*\* Multiple ratios are listed in the comment field.

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

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

## SECTION 01110

### SUMMARY OF WORK

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Section Includes

1. Work of the Contract is shown and described in a Project Manual entitled:  
Morningside Drive Culvert Replacement Project  
Town of Longmeadow  
July 2019
2. The Work includes the following work related to replacement of a culvert pipe on Morningside Drive:
  - a. Replacement of approximately 150 linear feet (LF) of existing 24-inch CMP culvert with 60-inch polypropylene culvert
  - b. Replacement of approximately 30 LF of existing 12-inch CPP drain with 18-inch polypropylene drain pipe
  - c. Replacement of approximately 90 LF of existing 12-inch CPP drain with 12-inch polypropylene drain pipe
  - d. Replacement of 2 catch basins and installation of 1 new drain structure with manhole riser
  - e. Installation of temporary water system and replacement of approximately 120 LF of existing 8-inch asbestos cement (AC) water main with 8-inch ductile iron water main and replacement of 1 hydrant
  - f. Replacement of approximately 100 LF of existing 8-inch AC gravity sewer with 8-inch PVC sewer and replacement of 1 sewer manhole riser section
  - g. Installation of temporary gas piping and replacement of approximately 120 LF of existing gas main (by the utility company)
  - h. Site and paving restoration, grading and slope stabilization
3. Additive Alternate No. 1 includes the replacement of two catch basin top slab/inlet structures.
4. Additive Alternate No. 2 includes the chemical sealing and cementitious lining of one sanitary sewer manhole.

###### B. Related Sections

1. Section 00520 - Agreement

## 2. Section 00800 - Supplementary Conditions

### 1.2 SUBMITTALS

#### A. Informational Submittals

1. Submit copies of permits or approvals required for the Work, prior to initiating the Work.

### 1.3 PROJECT/SITE CONDITIONS

#### A. Complete all Work within the Contract Time as set forth in Section 00520.

#### B. Permits

1. Obtain the permits and approvals listed below:
  - a. Permits and licenses of a temporary nature necessary for the prosecution of the Work.
  - b. Permits for disposal of construction wastes including disposal of existing pipe materials removed during repairs, lining materials for the pipeline and manholes.
  - c. Other permits or licenses required for the Contractor's operations or required elsewhere in the Contract Documents and not included herein.
2. Comply with the permits and approvals listed below:
  - a. Notice of Intent and Town of Longmeadow Conservation Commission Order of Conditions. A copy of the Notice of Intent and Order of Conditions is included in Section 00800.
3. Obtain permits and approvals from appropriate jurisdictional agencies and property owners for use of premises not furnished by the Owner, and for all off-site areas.
4. Submit copies of permits prior to performance of Work authorized by permits.

#### C. Existing Conditions

1. Use of Premises and Off-site Work
  - a. The Work shall occur on the Owner's property within the limits of Work shown in the Contract manual.
  - b. Obtain permits and approvals for use of any land and access thereto that is deemed necessary for the Work, where such land is not available for use by the Owner, including land for temporary construction facilities, access and egress, or for storage of materials. Confine apparatus and storage to such additional areas.

- c. Obtain permits and written approvals from appropriate jurisdictional agencies for the use of premises not available for use by the Owner, including all offsite staging areas, borrow pits and waste areas. Submit copies of all permits and approvals to the Owner prior to using areas.
- d. Provide for the disposal of waste materials off-site in accordance with all applicable laws.
- e. Adhere to the limits of Work as indicated, to minimize obstruction to traffic and inconvenience to the Owner, general public, and residents in the vicinity of the Work, and to protect people and property. Keep fire hydrants on or adjacent to the Work accessible to fire fighting equipment at all times.
- f. Make temporary provisions for the use of sidewalks and maintain functioning gutters, stormwater systems, drainage ditches, and culverts.
- g. Maintain public access to businesses and residences including driveways and parking lots at all times during the Work.

D. Other Requirements

- 1. The Town of Longmeadow will provide a backflow prevention assembly and a proposed hydrant location.
- 2. There will be no charge for potable water free of charge, as required for cleaning of the pipes and culvert, and installation of the lining operations.

PART 2 PRODUCTS

2.1 MATERIALS FURNISHED BY OWNER

- A. The Owner will not furnish any materials, labor or equipment under this Contract.

PART 3 EXECUTION – NOT USED

END OF SECTION





## SECTION 01140

### WORK RESTRICTIONS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Work Schedule
  - 2. Construction Constraints
  - 3. Available Work Area
  - 4. Site Usage Plan
- B. Related Requirements
  - 1. Section 01325 - Scheduling of Construction

##### 1.2 SUBMITTALS

- A. Incorporate the requirements of this Section in the project schedule submitted under Section 01325.
- B. Action Submittals
  - 1. Submit proposed access plan for the Morningside culvert within 14 days of the Notice to Proceed.

##### 1.3 WORK SCHEDULE

- A. Conduct the Work during daylight hours on Monday through Friday, and within the time between 7:00 a.m. and 5:00 p.m. No work is to be done on Owner's holidays, Saturdays, Sundays or outside of the work hours described above.

#### PART 2 PRODUCTS – NOT USED

#### PART 3 EXECUTION

##### 3.1 CONSTRUCTION CONSTRAINTS

- A. The following are constraints for the Work. Incorporate these constraints into the schedule required to be submitted under Section 01325.
  - 1. All components of the existing storm drain systems must remain in operation throughout the lining work. If necessary, drainage flows shall be pumped around work zones as needed.

##### 3.2 AVAILABLE WORK AREA

- A. Limits of construction are defined in the Contract Manual. No work will be permitted to be performed outside these boundaries. As such, only the public travel ways are to be utilized for work areas during cleaning, television and lining work.

### 3.3 SITE USAGE PLAN

- A. Submit a site usage plan showing all proposed access areas, staging areas, locations of all equipment and storage trailers, and material laydown areas. The site usage plan should be a drawing showing the proposed locations and shall include any on-site traffic modifications and temporary utilities as may be applicable.

END OF SECTION



## SECTION 01270

### MEASUREMENT AND PAYMENT

#### PART 1 GENERAL

##### 1.1 DIVISION 0 AND DIVISION 1 WORK INCIDENTAL TO THE CONTRACT PRICE

- A. No separate measurement or payment will be made for Work called for in Division 0 or Division 1 of the Specifications, unless specifically covered under the Bid items listed below. All costs associated with this Work will be considered incidental to the Contract Bid price.
- B. Division 2 through Division 13 Work will be measured and paid for at the Contractor's unit Bid price or lump sum item cost as indicated on the Bid form. Those payable Work items, and related prices as Bid, will be the basis for all compensation to the Contractor for Work performed under this Contract. Work not specifically included as a Bid item, but which is required to properly and satisfactorily complete the Work is considered ancillary and incidental to the Bid item Work, and payment for such Work is considered to be included in the values as Bid for payable items. Compensation for all unit Bid price Work will be made based on the measured quantity of Work under the appropriate Bid items.

##### 1.2 MOBILIZATION AND DEMOBILIZATION (ITEM 1)

- A. Measurement
  - 1. There will be no measurement for the mobilization and demobilization to the Site as this Work will be on a lump sum basis.
- B. Payment
  - 1. Payment of the lump sum Bid price will be paid in two equal installments. The first installment will occur at the time the first payment requisition is submitted after the Contractor has initiated full-time construction activity. Payment for the second installment will be included in the first payment request after Substantial Completion has been reached and all equipment has been removed from the Site. In no case will the total of both installments exceed 5 percent of the base Bid price.

##### 1.3 TRAFFIC CONTROL (EXCLUDES POLICE) (ITEM 2)

- A. Measurement
  - 1. There will be no measurement for traffic control as this Work will be on a lump sum basis.
- B. Payment
  - 1. Payment of the lump sum Bid price will be full compensation for all labor, equipment and materials required for or incidental to the traffic control Work. This item excludes police details. Police, if required, to be scheduled by the Contractor and paid directly by the Owner.

2. Payments will be made on a monthly basis as a percentage of the lump sum Bid and the amount of Work for that particular month.

#### 1.4 CLEARING AND GRUBBING (ITEM 3)

##### A. Measurement

1. There will be no measurement for clearing and grubbing as this Work will be on a lump sum basis.

##### B. Payment

1. Payment of the Bid price for clearing and grubbing will be full compensation for all labor, equipment and materials required for or incidental to the Work.

#### 1.5 TEST PITS (ITEM 4)

##### A. Measurement

1. Measurement for test pits will be on a cubic yard basis as approved and measured in the field by the Engineer.

##### B. Payment

1. Payment of the Bid price for test pits will be full compensation for all cutting of surfaces, excavation, backfill, compaction, dewatering, sheeting and bracing, required measurements, and all labor, equipment and materials required for incidental to the Work.

#### 1.6 UNSUITABLE MATERIAL EXCAVATION (ITEM 5)

##### A. Measurement

1. Measurement for excavation of unsuitable material will be on a cubic yard basis of earth excavated to install the pipeline as approved and measured by the Engineer. Measurement limits for payment purposes shall be as shown on the Drawings.

##### B. Payment

1. Payment of the Bid price for excavation will be full compensation for all excavation, removal and proper off-site disposal of the material, placing and removing sheeting or bracing, and all labor, equipment and materials required for or incidental to the Work.

#### 1.7 GRAVEL BORROW (ITEM 6)

##### A. Measurement

1. Measurement for gravel borrow will be on a cubic yard basis. The depth of gravel borrow will be the actual depth placed in the completed Work, but in no case shall this exceed the depth approved by the Engineer. Width measurement limits for payment purposes shall be as shown on the Drawings.

B. Payment

1. Payment of the Bid price for gravel borrow will be full compensation for furnishing, hauling, placing, spreading, and compacting, and include all labor, equipment and materials required for or incidental to the Work.

1.8 CRUSHED STONE BORROW (ITEM 7)

A. Measurement

1. Measurement for crushed stone borrow will be on a cubic yard basis. The depth of crushed stone will be actual depth placed in the completed Work, but in no case will this exceed the depth approved by the Engineer. Width measurement limits for payment purposes shall be as shown on the Drawings.
2. Crushed stone borrow that the Contractor uses as a method to control groundwater is at the Contractor's expense and will not be paid for under this item.
3.  $\frac{3}{4}$  inch crushed stone used for pipe bedding is to be included under the appropriate pipe items and will not be paid for under this item.

B. Payment

1. Payment of the Bid price for crushed stone borrow will be full compensation for furnishing, hauling, placing, spreading, and compacting, and include all labor, equipment, and materials required for or incidental to the Work.

1.9 ORDINARY BORROW (ITEM 8)

A. Measurement

1. Measurement for ordinary borrow will be on a cubic yard basis. The depth of ordinary borrow will be actual depth placed in the completed Work, but in no case will this exceed the depth approved by the Engineer. Width measurement limits for payment purposes shall be as shown on the Drawings.

B. Payment

1. Payment of the Bid price for ordinary borrow will be full compensation for furnishing, hauling, placing, spreading, and compacting, and includes all labor, equipment, and materials required for or incidental to the Work.

1.10 SAND BORROW (ITEM 9)

A. Measurement

1. Measurement for sand borrow will be on a cubic yard basis. The depth of sand will be actual depth placed in the completed Work, but in no case will this exceed the depth approved by the Engineer. Width measurement limits for payment purposes shall be as shown on the Drawings.

B. Payment

1. Payment of the Bid price for sand borrow will be full compensation for furnishing, hauling, placing, spreading, compacting including all labor, equipment, and materials required for or incidental to the Work.

1.11 SILTATION FENCING (ITEM 10)

A. Measurement

1. Measurement for siltation fence will be on a linear foot basis. The length of siltation fence will be the actual approved length of siltation fence measured in place by the Engineer.
2. Siltation fencing used by the Contractor for staging areas and stockpiles shall not be measured.

B. Payment

1. Payment of the Bid price for siltation fence will be full compensation for installation and removal of the siltation fence, and the restoration of the area disturbed by its placement including all labor, equipment and materials required for or incidental to the Work.

1.12 SILTATION SOCKS (ITEM 11)

A. Measurement

1. Measurement for siltation socks will be on a linear foot basis. The length of siltation socks will be the actual approved length of siltation socks measured in place by the Engineer.

B. Payment

1. Payment of the Bid price for siltation socks will be full compensation for installation and removal of the siltation socks, and the restoration of the area disturbed by its placement including all labor, equipment and materials required for or incidental to the Work.

1.13 CATCH BASIN SEDIMENTATION CONTROL (ITEM 12)

A. Measurement

1. Measurement for catchbasin sedimentation control will be a count of the catchbasins where sedimentation control measures are implemented as approved by the Engineer.

B. Payment

1. Payment of the Bid price for sedimentation control at each catchbasin will be full compensation for installation, maintenance and removal of the haybales and filter fabric, thorough cleaning of the catch basins after the controls are removed, and all labor, equipment and materials required for or incidental to the Work.

1.14 SMH#2- PRECAST CONCRETE MANHOLE RISER SECTION AND FRAME & COVER (ITEM 13)

A. Measurement

1. There will be no measurement as this Work will be on a lump sum basis.

B. Payment

1. Payment of the Bid price will be full compensation for the structure, frame and cover, installation, adjustment of frame and cover prior to paving, and all labor, equipment and materials required for or incidental to the Work.

1.15 DMH#1- 8' X 8' PRECAST CONCRETE STRUCTURE WITH MANHOLE RISER SECTION AND FRAME & COVER (ITEM 14)

A. Measurement

1. There will be no measurement as this Work will be on a lump sum basis.

B. Payment

1. Payment of the Bid price will be full compensation for the structure, frame and cover, invert, installation, testing, adjustment of frame and cover prior to paving, and all labor, equipment and materials required for or incidental to the Work.

1.16 CATCH BASIN TOP SLAB/INLET STRUCTURE (ITEM 15)

A. Measurement

1. Measurement for new catch basin top slab/inlet structures will be a count of the number provided.

B. Payment

1. Payment of the Bid price for each new catch basin top slab/inlet structure will be full compensation for removal and proper disposal of the old top slab; providing the new top slab/inlet structure, frame and grate; installation; adjustment of frame and grate prior to paving; and all labor, equipment and materials required for or incidental to the Work.

1.17 MAINLINE PVC GRAVITY SEWER PIPE (ITEM 16)

A. Measurement

1. Measurement for mainline PVC gravity sewer pipe will be on a linear foot basis and will be along the ground surface above and parallel to the pipeline from and to the inside face of structures. No deductions will be made for the length of fittings.



B. Payment

1. Payment of the Bid price for mainline PVC gravity pipe will be full compensation for providing and testing of all pipes, excavation and bedding, bypass pumping, warning tape, backfill and compaction and all labor, equipment and materials required for or incidental to the Work.
2. A 10 percent retainage will be held on payment for Item 16 until the required leakage testing Work is complete and satisfactory to the Engineer.

1.18 SANITARY SEWER/DRAIN MAINLINE CONNECTIONS (ITEM 17)

A. Measurement

1. Measurement for sanitary sewer/drain mainline connections will be a count of the number provided.

B. Payment

1. Payment of the lump sum Bid price for connections and tie-ins will be full compensation for all excavation, backfilling, compaction, couplings, removal and disposal of existing mains cut during the connection and tie-in, and all labor, equipment and materials required for or incidental to the Work.

1.19 POLYPROPYLENE DRAIN PIPE (ITEMS 18 THROUGH 20)

A. Measurement

1. Measurement for polypropylene drain pipe will be on a linear foot basis and will be along the ground surface above and parallel to the pipeline from and to the inside face of structures. No deductions will be made for the length of fittings.

B. Payment

1. Payment of the Bid price for polypropylene pipe will be full compensation for providing and testing of all pipes, excavation and bedding, bypass pumping, warning tape, backfill and compaction, RCP flared end outlet structures as shown on the Drawings, and all labor, equipment and materials required for or incidental to the Work.

1.20 TEMPORARY WATER MAIN (ITEM 21)

A. Measurement

1. There will be no measurement for temporary water main as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price for temporary water main will be full compensation for all excavation, backfilling, compaction, pipes, nipples, bends, valves, couplings, retainer glands, disinfection, venting, and all labor, equipment and materials required for or incidental to the Work.

## 1.21 DUCTILE IRON PIPE AND FITTINGS (ITEM 22)

### A. Measurement

1. Measurement for ductile iron pipe and fittings will be on a linear foot basis and will be along the ground surface above and parallel to the pipeline from the point of beginning to the point of termination. No deductions will be made for the length of valves and fittings. Allowances for the cost of main line fittings and tees shown on the Drawings shall be included in the pipe unit price. Valves shall be paid for under the applicable item.

### B. Payment

1. Payment of the Bid price for ductile iron pipe will be full compensation for all excavation, backfill, and compaction; trench dewatering; disposal of unsuitable material; for providing all pipes, fittings, thrust blocks and other materials for thrust restraint; warning tape; disinfection; flushing; testing; and all labor, equipment and materials required for or incidental to the Work.
2. A 10 percent retainage will be held on payment for Item 22 until the required leakage testing Work is complete and satisfactory to the Engineer.

## 1.22 HYDRANT ASSEMBLIES (ITEM 23)

### A. Measurement

1. Measurement for hydrant assemblies will be a count of each hydrant assembly provided and connected to the proposed water main.

### B. Payment

1. Payment of the Bid price for each hydrant assembly provided will be full compensation for the hydrant, main line tee, stone drain pocket, excavation, backfill, dewatering, compaction, clearing and grubbing, thrust block, hydrant lateral valve and box, all required 6 inch DI pipe, and all labor, equipment, and material required for or incidental to the Work. Included in the Bid price will be the additional hydrant components specified herein.

## 1.23 WATER MAIN CONNECTIONS (ITEM 24)

### A. Measurement

1. There will be no measurement for water main connections and street tie-ins as this Work will be on a lump sum basis.

B. Payment

1. Payment of the lump sum Bid price for water main connections and street tie-ins will be full compensation for all excavation, backfilling, compaction, thrust blocks, pipes, nipples, bends, valves, couplings, retainer glands, disinfection, venting, pressure testing, removal and disposal of existing mains cut during the connection and street tie-in, and all labor, equipment and materials required for or incidental to the Work.

1.24 ASBESTOS CEMENT WATER AND SEWER PIPE REMOVAL AND DISPOSAL (ITEM 25)

A. Measurement

1. Measurement for asbestos cement pipe removal and disposal will be on a linear foot basis.

B. Payment

1. Payment of the Bid price will be full compensation for the removal and lawful disposal of asbestos cement pipe and obtaining certificates of disposal for the pipe, including all labor, equipment and materials required for or incidental to the Work.
2. Payment for the removal of existing asbestos cement pipe will only be made for Work within the mainline trench, or as specifically specified at interconnections.

1.25 PERMANENT BITUMINOUS CONCRETE PAVING (ITEM 26)

A. Measurement

1. Measurement for permanent bituminous concrete pavement repair will be on a square yard basis as measured in the field by the Engineer. The length of the repair will be the actual length of the trench repaired. The width will be the actual width of repair made, but in no case will payment be made for trench repair greater in width than that shown on the Drawings.

B. Payment

1. Payment of the Bid price for permanent bituminous concrete pavement repair will be full compensation for saw cutting, preparation of the sub base, and furnishing, hauling, placing, spreading, and compacting the bituminous concrete, including all labor, equipment and materials required for or incidental to the Work.

1.26 BITUMINOUS CONCRETE CURBING (ITEM 27)

A. Measurement

1. Measurement for bituminous concrete curbing will be on a linear foot basis as measured in the field by the Engineer.

B. Payment

1. Payment of the Bid price for bituminous concrete curbing, including gravel base and all required backup material (gravel or loaming and seeding) will be full compensation for all labor, equipment and materials required for or incidental to the Work.

1.27 STEEL-BACKED WOODEN GUARDRAIL (ITEM 28)

A. Measurement

1. Measurement for the new guardrail will be on a linear foot basis as measured in the field by the Engineer.

B. Payment

1. Payment of the Bid price for guardrail installed, including the restoration of any disturbed paving or lawn area, will be full compensation for all labor, equipment and materials required for or incidental to the Work.

1.28 NORTH SIDE OF CULVERT- AREA RESTORATION AND SLOPE GRADING/STABILIZATION (ITEM 29)

A. Measurement

1. There will be no measurement as this Work will be on a lump sum basis.

B. Payment

1. Payment of the Bid price will be compensation for backfill material, grading, providing and installing erosion control fabric and soil fill, and seeding, including all labor, equipment, and materials required for or incidental to the Work.

1.29 SOUTH SIDE OF CULVERT- AREA RESTORATION AND SLOPE GRADING/STABILIZATION, INCLUDING RIPRAP EMBANKMENT (ITEM 30)

A. Measurement

1. There will be no measurement as this Work will be on a lump sum basis.

B. Payment

1. Payment of the Bid price will be compensation for backfill material, grading, providing and installing erosion control fabric and soil fill, seeding, and providing and placing riprap embankment, including all labor, equipment, and materials required for or incidental to the Work.

1.30 LOAM AND SEED (IN TREE BELT ADJACENT TO ROADWAY, EXCLUDING CULVERT SLOPES) (ITEM 31)

A. Measurement

1. Measurement for loam and seed will be on a square yard basis as measured in the field by the Engineer.

2. Measurement for payment under this item will be for loam and seed Work as required for lawn restoration and/or for "lawn quality" restoration of disturbed areas.
3. Loam and seed for wetlands replication or for the culvert side slopes is not included under this item.

B. Payment

1. Payment of the Bid price for loam and seed will be full compensation for all labor, equipment, and materials required for or incidental to the Work.

1.31 TEMPORARY SUPPORT OF UTILITY POLE (ITEM 32)

A. Measurement

1. There will be no measurement as this Work will be on a lump sum basis.

B. Payment

1. Payment of the Bid price will be full compensation for all labor, equipment, and materials required for or incidental to the Work.

1.32 GAS UTILITY ALLOWANCE FOR TEMPORARY GAS MAIN AND REPLACEMENT OF EXISTING GAS LINE (ITEM 33)

A. Measurement

1. There will be no measurement as this Work is an allowance item.

B. Payment

1. Payment for gas company utility charges shall be on the basis of the actual amount invoiced from the utility company. No mark-up on these charges will be allowed.

1.33 CB#1 AND CB#2- REPLACEMENT OF CATCH BASIN TOP SLABS/INLET STRUCTURES (ADDITIVE ALTERNATE NO. 1)

A. Measurement

1. There will be no measurement as this Work will be on a lump sum basis.

B. Payment

1. Payment of the Bid price will be full compensation for removal and proper disposal of the old top slabs; providing the new top slabs/inlet structures, frames and grates; installation; adjustment of frame and grate prior to paving; pavement restoration; and all labor, equipment and materials required for or incidental to the Work.

1.34 CHEMICAL SEALING AND CEMENTITIOUS LINING OF SMH#2 (ADDITIVE ALTERNATE NO. 2)

A. Measurement

1. There will be no measurement as this Work will be on a lump sum basis.

B. Payment

1. Payment of the Bid price will be full compensation for providing and testing of the chemical grouting, cementitious lining, and all labor, equipment and materials required for or incidental to the work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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## SECTION 01310

### COORDINATION

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Section Includes

1. Coordinate progress of the Work to minimize interference with the operation of the existing storm drain, water, sewer and gas systems.
2. Perform all coordination necessary to complete the work while maintaining the operation of the existing systems.

###### B. Related Sections

1. Section 01325 – Scheduling of Construction

#### PART 2 PRODUCTS - NOT USED

#### PART 3 EXECUTION

##### 3.1 SEQUENCE OF CONSTRUCTION

- A. Constructing the proposed improvements while maintaining existing operations will require a detailed sequence of construction. The Contractor will be allowed as much flexibility as possible in scheduling the details of the project. The Contractor shall provide a detailed schedule as required in Section 01325.
- B. The Contractor shall incorporate the following project scheduling requirements into development of the schedule submitted as required in Section 01325:
  1. The existing storm drain, water, sewer, and gas systems must remain in operation throughout construction.

##### 3.2 TEMPORARY CONSTRUCTION

- A. The Contractor shall be responsible for providing and maintaining all temporary flow diversion facilities, including bypass pumping equipment and temporary pipe/hose, as required to complete the work of this Contract.

END OF SECTION





## SECTION 01325

### SCHEDULING OF CONSTRUCTION

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Progress Schedule
- B. Related Requirements
  - 1. Section 01140 - Work Restrictions
  - 2. Section 01310 - Coordination

##### 1.2 REFERENCES

- A. The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry, an Associated General Contractors (AGC) of America publication.

##### 1.3 PROGRESS SCHEDULE

- A. Network Analysis
  - 1. Prepare an electronic network analysis using the critical path method under concepts and methods outlined in the current edition of AGC's "The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry."
- B. Graphically show the order and interdependence of activities, sequence of Work, how the start of a given activity depends on completion of preceding activities, and how completion of an activity may restrain the start of subsequent activities.
- C. The Work shall be planned by the Contractor and his Project field superintendent in coordination with all Subcontractors and Suppliers whose Work is shown on the Progress Schedule.
- D. Include, at a minimum, the following activities on the Progress Schedule:
  - 1. Project mobilization
    - a. Submittal and approval of Shop Drawings
    - b. Procurement of equipment and critical materials
    - c. Installation of equipment and critical materials
    - d. Fabrication of special equipment and material, and its installation and testing
    - e. Final inspecting and testing
    - f. Punchlist
    - g. Final cleanup

- h. Other activities that may be critical to the Progress Schedule
  - i. All activities of the Owner and the Engineer which affect progress and/or affect required dates for completion of the Work
- E. Take into consideration Shop Drawing submittal and approval time, the delivery times of equipment and materials, Subcontractors' Work, availability and abilities of workmen, weather conditions, any restrictions in operations at the Work site, and all other items that may affect completion of the Work within the Contract Time.
- F. The Progress Schedule shall reflect Work restrictions outlined in Section 01140.
- G. Show information in such detail that duration times of activities will range from one to 15 days. The selection and number of activities shall be subject to the approval of the Owner and Engineer.
- H. The Progress Schedule should show preceding and following event numbers for each activity, description of each activity, and activity duration in calendar days.
- I. Submit the Progress Schedule on maximum sheet size 30-inches high by the width required.

#### 1.4 SUBMITTALS

##### A. Informational Submittals

1. Submit two prints of the preliminary Progress Schedule prepared in accordance with Article 2.05 of Section 00700 and the requirements of this section. Progress schedule must be submitted within 10 days after the Effective Date of the Agreement. Progress Schedule must be approved by the Owner and Engineer before the first progress payment will be made.
2. Revised analyses - Within 10 days after receipt of the review comments, submit two prints of the Progress Schedule revised in accordance with those comments.
3. Periodic reports - On the first progress meeting of each month, submit two prints of the updated Progress Schedule, as well as a report of construction activities in the prior month.
4. Before initiating the Work, submit an estimated monthly rate of Contractor payments for the project. If the payment schedule deviates from the original projection, submit a revised rate of expenditure schedule.

#### 1.5 PERIODIC REPORTS

- A. At the first scheduled progress meeting of each month, present two copies of a construction report which details the Work performed during the preceding period. The report shall include the following at a minimum:
1. Actual progress of Work. Update the Progress Schedule accordingly.

2. The Progress Schedule, or revised Progress Schedule, should show the portions of the Progress Schedule impacted by the Work progress.
3. Activities or portions of activities completed during the reporting period, and their total value as basis for Contractor's periodic request for payment. Payment made will be based on the total value of such activities completed or partially completed after verification by the Engineer.
4. State the percentage of the Work actually completed and scheduled as of the report date, and the progress along the critical path in terms of days ahead of or behind the dates defined in the Progress Schedule.
5. If the Work is behind the dates set forth in the Progress Schedule, also report progress along other paths with negative slack.
6. Include a narrative which includes:
  - a. A description of problem areas, anticipated and current
  - b. Delaying factors and their impact
  - c. An explanation of corrective actions taken or proposed
7. Show the date of latest revision.

## PART 2 PRODUCTS – NOT USED

## PART 3 EXECUTION

### 3.1 GENERAL

- A. Schedule the sequence of work to limit the number of times a street or area is disturbed.

END OF SECTION



## SECTION 01330

### SUBMITTAL PROCEDURES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Action Submittals
  - 2. Informational Submittals

##### 1.2 DEFINITIONS

- A. Action Submittals – includes written and graphic information submitted by Contractor that requires Engineer's approval.
- B. Informational Submittals – includes information submitted by Contractor that does not require Engineer's approval. The Engineer will acknowledge receipt of such documents and provide comments when the submittals lack the detail required by the Contract Documents.

##### 1.3 ACTION SUBMITTALS

- 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 drawings, schedule information, piece part drawings, actual shopwork manufacturing instructions, special wiring diagrams, coordination drawings, individual system or equipment inspection and test reports including performance curves and certification, as applicable to the Work.
  - 2. Shop Drawings shall be of standardized sizes to enable the Owner to maintain a permanent record of the submissions. Approved standard size drawings shall be
    - a. 24-inches by 36-inches
    - b. 22-inches by 34-inches
    - c. 11-inches by 17-inches
    - d. 8.5-inches by 11-inches
  - 3. Submit Shop Drawings at the proper time so as to prevent delays in delivery of materials. Coordinate submittals for related or interdependent equipment.
  - 4. Advise the Engineer in writing of any deviations from the requirements of the Contract Documents.

5. Check all Shop Drawings regarding measurements, size of members, materials, and details to determine if they conform to the Contract Documents. Shop Drawings found to be inaccurate, not in compliance, or otherwise in error shall be returned to the Subcontractors or Suppliers for correction before submission to the Engineer. Drawings that are current shall be marked with the date, name, and approval stamp of the Contractor.
  6. All details on Shop Drawings submitted for approval shall show clearly the relation of the various parts to the main members and lines of the structure, and where correct fabrication of the work depends upon field measurements, such measurements shall be made and noted on the Shop Drawings before being submitted for approval.
  7. Detailed installation drawings (sewers, equipment, piping, electrical conduits and controls, HVAC work, and plumbing, etc.) shall be drawn to scale and fully dimensioned.
  8. No material or equipment shall be purchased or fabricated until the required Shop Drawings have been submitted and approved. Materials and equipment and the work involved in their installation or incorporation into the Work shall then be as shown in and represented by the Shop Drawings.
  9. Until the necessary approval has been given, do not proceed with any portion of the work, the design or details of which are dependent upon the design or details of work, materials, equipment or other features for which approval is required.
  10. If submitted equipment requires modifications to the structures, piping, layout, or other details shown on the Drawings, details of the proposed modifications must also be submitted for approval. If such equipment and modifications are approved, perform all Work necessary to make such modifications at no additional cost to the Owner.
- B. Product Data: Product data as specified in individual Sections, include, but are not necessarily limited to, standard prepared data for manufactured products (catalog data), such as the manufacturer's product specification and installation instructions, availability of colors and patterns, manufacturer's printed statements of compliances and applicability, roughing-in diagrams and templates, catalog cuts, product photographs, standard wiring diagrams, printed performance curves and operational-range diagrams, production or quality control inspection and test reports and certifications, mill reports, product operating and maintenance instructions and recommended spare-parts listing, and printed product warranties, as applicable to the Work.
- C. Samples and color selection charts: Provide sample, when requested by individual Specification to establish conformance with the Specifications, and as necessary to define color, texture and pattern selections available.
- D. Product Substitutions: In accordance with Section 01630.
- E. Operation and Maintenance Manuals: In accordance with Section 01770.
- F. Schedule of Values: In accordance with Section 01295.

G. Site Usage Plan: In accordance with Section 01140.

#### 1.4 INFORMATIONAL SUBMITTALS

##### A. Schedule of Submittals

1. Submit a preliminary Schedule of Submittals within 10 days of the Effective Date of the Agreement in accordance with Article 2.05 of Section 00700.

##### B. Schedule of Manufacturers and Suppliers

1. Submit a schedule of manufacturers and Suppliers within 7 days after Notice to Proceed including the names and addresses of the manufacturers and Suppliers of materials and equipment to be incorporated into the Work.

##### C. Schedule of Major Products

1. Submit a schedule of major products within 30 days after Notice to Proceed including a complete list of major products proposed for use, with specification section number, name of manufacturer, trade name, and model number of each product.

##### D. Product Listing and Manufacturers Qualifications

1. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation and reference standards. Specifically identify the products, the anticipated schedule for delivery and storage, and the estimated value thereof for materials which the Contractor intends to request approval for off-site storage.

##### E. Certificates of Compliance

1. General:
  - a. Submit sworn certificates from the manufacturer or material supplier that the materials and fabrications provided under the Specification section conform with the Contract Documents.
  - b. Certificates shall be signed by an officer of the manufacturer's corporation and witnessed by a Notary Public.
2. Welding: Submit in accordance with individual Specification sections.
3. Installer: Prepare written statements on manufacturer's letterhead certifying that installer complies with requirements as specified in individual Specification sections.
4. Material Test: Prepared by qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.
5. Certificates of Successful Testing or Inspection: Submit when testing or inspection is required by Laws and Regulations or governing agency, or when specified in individual Specification sections.



6. Manufacturer's Certificate of Compliance: In accordance with individual Specification sections.
- F. Application for Payment
1. Submit applications for payment in accordance with Section 01270, Measurement and Payment or Section 01290, Application and Certificate for Payment.
  2. Submit schedule of stored materials when requesting payment for materials not yet installed.
- G. Construction Photography and Videography: Provide preconstruction, progress, and post-construction photography and videography in accordance with Sections 01320.
- H. Contract Closeout Submittals: In accordance with Section 01770.
- I. Contractor Design Data
1. Written and graphic information
  2. List of assumptions
  3. List of performance and design criteria
  4. Summary of loads or load diagram
  5. Calculations
  6. List of applicable codes and regulations
  7. Name and version of software
  8. Information requested in individual Specification section
- J. Manufacturer's Instructions: Written or published information that documents manufacturer's recommendations, guidelines, and procedures in accordance with individual Specification sections.
- K. Schedules - Submit construction progress schedules and schedule updates in accordance with Section 01325.
- L. Statement of Qualifications: Submit evidence of qualification, certification, or registration as required in Contract Documents to verify qualifications of professional land surveyor, engineer, materials testing laboratory, specialty subcontractor, trade, specialist, consultant, installer, and other professionals.
- M. Submittals Required by Laws, Regulations, and Governing Agencies
1. Submit promptly notifications, reports, certifications, payrolls, and other required information as may be required, directly to the applicable federal, state, or local governing agency or their representative.
  2. Transmit to Engineer for Owner's records, one copy of correspondence and transmittals (including enclosures and attachments) between Contractor and governing agency.

- N. Test and Inspection Reports
  - 1. Submit test and inspection reports as required by individual Specification sections.
  - 2. Test and inspection reports shall contain signature of person responsible for test or report.
  - 3. Reports shall include identification of product and Specification, project name, date and time of test, type of test, location, test results, corrective action required if report indicates test is not in compliance with Contract Documents, interpretation of test results, and other information as required in individual Specification sections.
- O. Testing and Start-up Data: Prepare and submit testing procedures proposed to perform testing required by individual Specification sections.
- P. Vendor Training Plan: At least two weeks prior to scheduling training of Owner's personnel, submit lesson plans for vendor training in accordance with individual Specification section and manufacturer's Operations and Maintenance Manuals.
- Q. Health & Safety Plans: When specified in individual Specification sections, prepare and submit a Health and Safety Plan modified or supplemented to include job-specific considerations.
- R. Submittals stamped by another Professional Engineer: When specified in individual Specification sections, prepare and submit calculations and/or drawings stamped by a Professional Engineer licensed in the State where the work is being performed.
- S. Coordination Drawings: When specified in individual Specification sections, prepare and submit drawings to show how multiple system and interdisciplinary work will be coordinated. Examples are conduit routing diagrams, duct layouts, utility coordination drawings, sprinkler plans etc.
- T. Work Plans: When specified in individual Specification sections, prepare and submit copies of all work plans needed to demonstrate to the Owner that Contractor has adequately thought-out the means and methods of construction and their interface with existing facilities.
- U. Erosion Control Plan: When specified in Contract Documents or required by local ordinances or regulations, prepare and submit copies of erosion control plans.
- V. Traffic Control Plan: When specified in Contract Documents or required by local ordinances or regulations, prepare and submit copies of traffic control plans.
- W. Shutdown Requests: Submit notification of any outages required (electrical, flow processes, etc.) as may be required to tie-in new work into existing facilities. Unless otherwise specified, provide outage requests a minimum of 7 days notice shall be provided.

## 1.5 PROCEDURES

### A. Coordination

1. Prepare and submit documentation in advance of fabrication and product manufacturer, so that the installation will not be delayed, other related work can be properly coordinated, and there is adequate time for review and resubmission, if required.
2. Provide no less than 30 days for review of submittals from the time received by the Engineer. For submittals of major equipment, that require more than 30 days to review, due to complexity and detail or those requiring review by multiple engineering disciplines, Engineer will notify Contractor of the circumstances and identify the anticipated date when the submittal will be returned.
3. Re-submittals will be subject to same review time.
4. No extension of time will be authorized due to failure to provide approvable submittals sufficiently in advance of the Work.

### B. Review Shop Drawings, product data, and samples prior to submission and verify and determine:

1. Field measurements
2. Conformance with the Contract Documents. Advise the Engineer in writing of any deviations from the requirements of the Contract Documents.
3. Delete or strike out information that is not applicable to the Work.

### C. Submit the following number of copies:

1. Submittals – Unless otherwise noted in the individual Specification section, provide 6 sets of submittals.
  - a. 3 will be retained by the Engineer: 1 for Owner, 1 for Engineer's file, and 1 for Engineer's construction observer
  - b. 3 for Contractor
  - c. At the Contractor's request, the Engineer may allow electronic submissions provided by the Contractor in PDF format.
2. Samples – Provide one unless otherwise noted in the individual Specification section. Sample will be retained by Engineer in the field.
3. A maximum of 3 submittals will be returned by the Engineer with notations to the Contractor via First Class United States Postal Service or ground service by other carriers. At the Contractor's request, the Engineer may allow electronic submissions provided by the Contractor in PDF format.

- D. Numbering: Submissions shall be accompanied by a transmittal form referencing the project name and applicable Specification section. Submittals shall be referenced with consecutive numbering. Resubmittals shall bear the same transmittal number with a sequential letter suffix commencing with "A".
- E. Provide a copy of the Submittal certification form (copy attached at the end of this section) which shall be attached to every copy of each Shop Drawing as required under Article 6.17 C.2 of Section 00700. Apply the Contractor's stamp and initials or signature certifying that the submission has been thoroughly reviewed for completeness, compliance with the Contract Documents, coordination with adjacent construction and dimensional compatibility. Items submitted without the stamp or that are incomplete will be returned by the Engineer for rework and resubmission.
- F. Provide a copy of the P.E. certification form (copy attached at the end of this section) which shall be attached to every copy of each Submittal stamped by another Professional Engineer. Items submitted without the completed certification form will be returned by the Engineer for resubmission.
- G. Distribute copies of reviewed submittals along with the Engineer's transmittal to concerned parties with instructions to promptly report any inability to comply with the provisions or integrate the requirements with interfacing work.
- H. Partial and Incomplete Submittals
  - 1. Shop Drawings shall be submitted as a complete package by Specification section, unless otherwise reviewed and approved by the Engineer. It is the intent that all information, materials, and samples associated with each Specification section be included as a single submittal for the Engineer's review.
  - 2. Engineer will return entire submittals if preliminary review deems it incomplete including:
    - a. Missing or incomplete Submittal certification form
    - b. Insufficient number of copies
    - c. Missing content
  - 3. Partial submittals may be considered, at Engineer's option, only when necessary to expedite the Project.
  - 4. Partial submittals shall be clearly identified as such on the transmittal to identify missing components.
- I. Submittals not required by the Specification will be returned without review or action code.
- J. Resubmission
  - 1. Make corrections and modifications required by the Engineer and resubmit until approved.

2. Clearly identify changes made to submittals and indicate other changes that have been made other than those requested by the Engineer.
3. A maximum of two re-submissions of each shop drawing will be reviewed, checked and commented upon without charge to the Contractor (total of 3 submittals). Any additional submissions which are required by the Engineer to fulfill the stipulations of the Contract Documents will be charged to the Contractor.

K. Distribution

1. Distribute approved Shop Drawings and approved product data to the Project Site and elsewhere as required to communicate the information to Suppliers, Subcontractors, and field personnel.
2. Samples will be retained by the Engineer at the Site.

## 1.6 ENGINEER'S REVIEW

- A. The Engineer will review submittals for design, general methods of construction and detailing. The Engineer's review and approval of submittals shall not be construed as a complete check nor does it relieve the Contractor from responsibility for any departures or deviations from the requirements of the Contract Documents unless he has, in writing, called the Engineer's attention to such deviations at the time of submission. It will not extend to means, methods, technique, sequences, or procedures of construction (except where specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto.
- B. The Engineer's review of the submittals shall not relieve the Contractor from the responsibility for proper fitting of the Work, or the responsibility of furnishing any work required by the Contract Documents which may not be indicated on the submittals. The Contractor shall be solely responsible for any quantities shown on the submittals.
- C. If the Contractor considers any correction indicated on the submittals to constitute a change to the Contract Documents, the Contractor shall provide written notice to the Engineer at least 7 working days prior to release for manufacture.
- D. When the submittals 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.
- E. Action submittals as defined in paragraph 1.2 will be reviewed and returned under one of the following codes:
  1. Approved (Action Code 1) is assigned when there are no notations or comments on the submittal. Equipment or materials may be released for manufacture, provided that it complies with requirements of the Contract Documents.

2. Approved as Noted (Action Code 2) is assigned when there are notations or comments on the submittal, but the equipment or materials may still be released for manufacture. All notations and comments must be incorporated in the final product. Resubmission is not necessary.
  3. Revise and Resubmit (Action Code 3) is assigned when there are notations and comments requiring a resubmittal of the package. Work cannot proceed until the submittal is revised and resubmitted for review.
  4. Not Approved (Action Code 4) is assigned when the submittal contains non-specified items or does not meet the requirements of the Contract Documents. It may also be assigned when there is a significant amount of missing material required for the Engineer to perform a complete review. The entire package must be resubmitted, revised to bring the submittal into conformance. It may be necessary to resubmit using a different manufacturer/vendor to meet the requirements of the Contract Documents.
- F. Informational submittals as defined in paragraph 1.2 do not require approval by the Engineer. Such submittals will be returned under one of the following codes:
1. Receipt Acknowledged (Action Code 5) is assigned when the submittal is provided for documentation purposes and is acknowledged as received. Comments may be noted using this action code.
  2. Revise and Resubmit (Action Code 6) is assigned when there are notations and comments requiring a resubmittal of the package.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION



**SUBMITTAL CERTIFICATION FORM**

PROJECT: \_\_\_\_\_  
 ENGINEER: \_\_\_\_\_ ENGINEER'S PROJECT NO.: \_\_\_\_\_  
 CONTRACTOR: \_\_\_\_\_ CONTRACTOR'S PROJECT NO.: \_\_\_\_\_

TRANSMITTAL NO.: \_\_\_\_\_ SUBMITTAL NO.: \_\_\_\_\_  
 SPECIFICATION NO.: \_\_\_\_\_ DRAWING NO.: \_\_\_\_\_  
 DESCRIPTION: \_\_\_\_\_  
 MANUFACTURER: \_\_\_\_\_

The above referenced submittal has been reviewed by the undersigned and I/we certify that the materials and/or equipment meets or exceeds the project specification requirements; that field measurements, dimensions, quantities, specified performance criteria, installation requirements, materials, catalog numbers and related materials have been verified; that all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the work has been determined and verified; that review includes all information related to the contractor's sole responsibility for means, methods, techniques, sequences, and procedures of construction and safety; and item has been coordinated with the overall project with:

- NO DEVIATIONS
- A COMPLETE LIST OF DEVIATIONS AS FOLLOWS:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SUBMITTED BY: \_\_\_\_\_ DATE: \_\_\_\_\_

GENERAL CONTRACTOR'S STAMP



**P.E. CERTIFICATION FORM**

The undersigned hereby certifies that he/she is a professional engineer registered in the Commonwealth of Massachusetts and that he/she has been employed by

\_\_\_\_\_ to design  
(Name of Contractor)

\_\_\_\_\_  
(Insert P.E. Responsibilities)

In accordance with Specification Section \_\_\_\_\_ for the

\_\_\_\_\_  
(Name of Project)

The undersigned further certifies that he/she has performed the said design in conformance with all applicable local, state and federal codes, rules and regulations; and, that his/her signature and P.E. stamp have been affixed to all calculations and drawings used in, and resulting from, the design.

The undersigned hereby agrees to make all original design drawings and calculations available to the

\_\_\_\_\_ (Insert Name  
of Owner)

or Owner's representative within seven days following written request therefor by the Owner.

\_\_\_\_\_  
P.E. Name

\_\_\_\_\_  
Contractor's Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

\_\_\_\_\_  
Address

\_\_\_\_\_  
Address





## SECTION 01350

### HEALTH & SAFETY PLAN

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Section Includes

1. Furnish all labor, equipment and materials and perform all operations in connection with monitoring air quality, decontaminating equipment and providing worker health and safety protection for all Contractor personnel and buildings or structures in the work area, if necessary.
2. Develop a site specific Health and Safety Plan (HASP) specifically addressing the potential hazards that may be encountered. This plan shall meet all OSHA requirements.
3. Review the requirements and data presented and supplement the program with any additional measures deemed necessary to fully comply with regulatory requirements and adequately protect personnel on the site and buildings or structures in the work area, if necessary.

##### 1.2 REFERENCES

- A. OSHA Regulation 29 CFR 1910.120
- B. OSHA Regulation 29 CFR 1926.62

##### 1.3 DEFINITIONS

- A. Site Safety Official (SSO) - The individual located on a hazardous waste site who is responsible to the Contractor and has the authority and knowledge necessary to implement the site safety and health plan and verify compliance with applicable safety and health requirements.
- B. Uncontrolled Hazardous Waste Site means an area identified as an uncontrolled hazardous waste site by a governmental body, whether Federal, state, local or other where an accumulation of hazardous substances creates a threat to the health and safety of individuals or the environment or both.

##### 1.4 SUBMITTALS

- A. Submit the following to the Owner within seven days after execution of the Agreement.
  1. Site-specific Health and Safety Plan including the Emergency Response Plan, including provisions for decontamination and a contingency plan for unforeseen emergencies. The Owner's review is only to determine if the Plan meets basic regulatory requirements and the minimum requirements of this Section. The review will not determine the adequacy of the plan to address all potential hazards, as that remains the sole responsibility of the Contractor.

2. Current certification of employee's health and safety training and certification of employee's baseline medical exam status
  3. Certification of additional required health and safety training for Supervisors
  4. Qualifications and experience of the SSO for approval
- B. Submit minutes of weekly safety meetings at periodic progress meetings.

#### 1.5 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor is solely responsible for the health and safety of workers employed by the Contractor, any subcontractor and anyone directly or indirectly employed by any of them as well as occupants of any buildings or structures adjacent to the work.
- B. Work under this contract is not being performed on an "Uncontrolled Hazardous Waste Site," as defined in 29 CFR 1910.120. Develop and follow a site specific Health & Safety Plan (H&SP) in accordance with the requirements of paragraph 1.6.
- C. Provide a full-time SSO regardless of whether or not the Work is at a defined Uncontrolled Hazardous Waste Site.
- D. Pre-arrange emergency medical care services at a nearby hospital, including establishment of emergency routes of travel.
- E. Conduct weekly safety meetings with all site personnel, documenting attendance and topics covered.
- F. Train all workers assigned to areas where contaminated media are likely to be encountered in accordance with 29 CFR 1910.120.
- G. In areas where contaminated media are likely to be encountered, or created during the work, monitor air quality in and around work area or areas of concern using appropriate air monitoring equipment, as indicated in Part 2. Record all readings and maintain record on site. Stop work and/or upgrade respiratory protection or personal protective equipment levels if action levels established in the HASP are exceeded and take all other necessary mitigation actions. Ensure that degree and type of respiratory protection provided is consistent with the monitored concentrations and individual chemical parameters. Lawfully dispose of all contaminated clothing and equipment that cannot be decontaminated.
- H. At all times, prevent oil or other hazardous substances from entering the reservoir, ground, sewers, drainage areas, piping systems, buildings and structures.

#### 1.6 HEALTH & SAFETY PLAN (HASP) REQUIREMENTS

- A. The following items shall be addressed in the HASP:
  1. Safety and health hazard assessment
  2. Procedures for emergency medical treatment and first aid

3. Map indicating route to hospital for emergency medical care
4. Equipment decontamination procedures
5. Air monitoring procedures and action levels
6. Personal protective equipment and decontamination
7. Physical hazard evaluation and abatement including:
  - a. Equipment operation
  - b. Confined space entry
  - c. Slips and falls
  - d. Building collapse
  - e. Falling debris
  - f. Encountering unmarked utilities
  - g. Cold and heat stress
  - h. Hot work (cutting and welding)
  - i. Excavation entry
8. Training requirements
9. Recordkeeping requirements
10. Emergency response plan that includes
  - a. Names of three Emergency Response Contractors, experienced in the removal and disposal of oils and hazardous chemicals, that the Contractor intends to use in the event of an emergency
  - b. Evacuation routes and procedures
  - c. Emergency alerting and response procedures

#### 1.7 CONTINGENCY MEASURES & NOTIFICATIONS

- A. The potential for encountering hazardous buried objects or materials that could pose a threat to human health or the environment exists in areas outside the defined hazardous areas. In the event that potentially hazardous materials are encountered during the work under this contract, the responsibilities of the Contractor and the Owner are described herein.
- B. The procedures and protocols to be used by the SSO in defining materials that are potentially hazardous include screening with a photoionization detector, odor, visual appearance of a material, and obvious oil or chemical contaminated materials.

- C. Upon encountering suspected hazardous buried objects or materials as described above, cover the excavation immediately if no imminent danger, as defined by the SSO, is present. If there is an imminent danger, as defined by the SSO, evacuate the area immediately. The SSO shall then notify the Owner of the situation.
- D. Establish, properly barricade, and mark the area as an exclusion zone under the direction of the SSO. The SSO shall establish the exclusion zone boundaries based upon air quality monitoring using a photoionization detector and other equipment as appropriate. The exclusion zone shall be established at a minimum 50-foot radius around the location where the potentially hazardous material is encountered. Work within the exclusion zone shall be discontinued until the hazardous condition has been remediated and testing indicates that a hazard does not exist. Other activities of the site, outside the limits of the exclusion zone shall continue. Ambient air quality monitoring shall be performed by the SSO to demonstrate that ambient air quality in other portions of the site is not adversely impacted by the exclusion zone condition.
- E. Notify the Owner regarding the presence of potentially hazardous materials. The Owner may direct the Contractor to notify regulators and to obtain necessary regulatory approvals for remediation.
- F. Mobilize the appropriate equipment and personnel to sample and test the hazardous material within the exclusion zone to determine the remedial action required, subject to the Engineer's direction. The Contractor may be directed to remove and legally dispose of the material. Compensation for the removal and disposal of hazardous material will be as a Change in Work and Change in Contract Price in accordance with the General Conditions, if not covered under a specific bid item.

## PART 2 PRODUCTS

### 2.1 AIR MONITORING EQUIPMENT

- A. Provide and maintain portable photoionization detector or organic vapor analyzer capable of detecting organic vapors or total hydrocarbons. Equipment shall be sensitive to the 0.5 PPM level.
- B. Provide and maintain an oxygen analyzer to measure oxygen concentration in any trench or confined space prior to entry, as determined by the SSO.
- C. Provide and maintain an explosimeter whenever the potential for accumulation of explosive gases exists, as determined by the SSO.
- D. All air monitoring equipment shall remain the property of the Contractor.

## PART 3 EXECUTION - NOT USED

END OF SECTION

## SECTION 01520

### CONSTRUCTION FACILITIES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Temporary sanitary facilities
  - 2. First aid station

##### 1.2 QUALITY ASSURANCE

- A. Maintain temporary construction facilities in proper and safe condition throughout the progress of the Work.

##### 1.3 TEMPORARY SANITARY AND FIRST AID FACILITIES

- A. Provide suitably enclosed chemical or self-contained toilet(s) for the use of the labor force employed on the Work. Toilet(s) shall be located near the Work site(s) and secluded from observation insofar as possible. Toilet(s) shall be serviced weekly, kept clean and supplied throughout the course of the Work.
- B. Contractor shall enforce proper use of sanitary facilities.
- C. Use of the Owner's sanitary facilities by the Contractor is prohibited.
- D. Provide a first aid station at the site.

#### PART 2 PRODUCTS – NOT USED

#### PART 3 EXECUTION – NOT USED

END OF SECTION



## SECTION 01550

### TRAFFIC REGULATION

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Traffic requirements
  - 2. Traffic officers

##### 1.2 PAYMENT PROCEDURES

- 1. Refer to Section 01270, Measurement and Payment for procedures relating to payment for the Work.
- 2. Owner will pay for traffic officers if they are required. Contractor is responsible for scheduling the traffic officers, with Owner's approval, and for providing all documentation.
- 3. Owner will deduct from monies due Contractor for the following abnormal and unreasonable expenses:
  - a. Contractor caused delays in the prosecution of work that result in hiring traffic officers for more hours than would have been required during normal prosecution of work.
  - b. Reconstruction and/or reinstallation of any portions of the work, as a result of improper initial installation or defective material, for which traffic officers are required.
  - c. Traffic officers required at a site where Contractor is not working or outside of Contractor's standard work day as a result of obstructions to traffic that remain in the traveled way.
  - d. All other incidents resulting from Contractor's operations requiring traffic officers that would not normally be encountered during the progress of a well-organized project employing proper construction methods.
  - e. When traffic officers are requested for the convenience of Contractor and are not otherwise considered necessary to the work.

##### 1.3 REFERENCES

- A. Manual of Uniform Traffic Control Devices, U.S. Department of Transportation

##### 1.4 TRAFFIC REQUIREMENTS

- A. Arrange construction activity so that all streets shall remain open to at least one-way traffic during periods of actual work, and to unimpeded, two-way traffic during all other periods.



- B. Provide a traffic control plan to Engineer for approval showing traffic control signs, barrels, cones, traffic officers, including detour signs, meeting the approval of Engineer, Owner and local Police Departments in accordance with the Manual of Uniform Traffic Control Devices.
- C. Determine the location of each day's work and implement the approved traffic control plan. If the plan requires the use of traffic officers, notify the Police Department.
- D. Contractor shall have no claim of delay if he does not notify the Police Department of his scheduled location in time to arrange for traffic officers.
- E. Hand deliver written notice to individual houses affected by driveway and side road closings or detours a minimum 24 hours in advance. A recommended parking area outside the work limits shall be included in the notice.

#### 1.5 TRAFFIC OFFICERS

- A. Uniformed traffic officers shall be required at locations deemed necessary by Owner, working in conjunction with local Police and Fire Departments, for the protection of the public.
- B. The Police Chief or his representative, in consultation with Owner's representative, will determine the number of officers required for the work.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

## SECTION 01570

### TEMPORARY CONTROLS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Dust control
  - 2. Drainage and erosion control
  - 3. Siltation Fence and Siltation Socks
  - 4. Haybales
  - 5. Catch Basin Inlet Protection
  - 6. Daily Cleanup
- B. Related Sections
  - 1. Section 02920 – Lawns and Grasses
- C. Contractor shall comply with the requirements of the Notice of Intent and Town of Longmeadow Conservation Commission Order of Conditions, attached to Section 00800.

##### 1.2 TEMPORARY DUST CONTROL

- A. Exercise particular care to control dust both during and after construction. A mechanical street sweeper shall be used as needed.
- B. Prevent dust from becoming a nuisance or hazard. During construction, excavated material and open or stripped areas are to be properly policed and controlled so as to prevent spreading of the material.
- C. Control dust during and after construction using calcium chloride and/or salt. The Engineer may direct the Contractor to employ sprinkling of water in lieu of calcium chloride for dust control.
- D. During and after construction, all paved road and driveway surfaces are to be scraped and broomed free of excavated materials on a daily basis. The surfaces are to be hosed down or otherwise treated to eliminate active or potential dust conditions and the natural road or wearing surface is to be exposed.

##### 1.3 DRAINAGE AND EROSION CONTROL

- A. Install and maintain sediment trapping system.
- B. Discharge surface runoff from any disturbances to the site into silt containment basins. Siltation prevention measures utilizing geotextile fences and siltation socks for containment shall be taken before discharge to drainage systems.

#### 1.4 DAILY CLEANUP

- A. The Contractor shall furnish and install in a manner satisfactory to the Engineer and local police all barricades and warning signs and lights.
- B. The Contractor shall confine his operations to the shortest possible distance and must clean up his work area.

### PART 2 PRODUCTS

#### 2.1 FILTER FABRIC

- A. Filter fabric siltation fencing shall be a woven filter fabric having a weight of at least 2.5 ounces per square yard, a thickness of at least 17 mils, a coefficient of permeability of not less than 0.0009 centimeters per second and allows a water flow rate of a minimum 40 gallons per minute per square yard. The material shall have a high sediment filtration capacity, high slurry flow and minimum clogging characteristics. The material shall be equal to 100x as manufactured by Mirafi, Inc., Charlotte, North Carolina.

#### 2.2 HAYBALES

- A. Haybales required for siltation control shall be wire tied bales of the type normally used for siltation or erosion control or construction projects.

#### 2.3 CATCH BASIN INLET PROTECTION

- A. Provide catch basin inlet erosion control measures.

### PART 3 EXECUTION

#### 3.1 SILTATION SOCKS

- A. Control of erosion and siltation during the construction is expected to require mulching, siltation socks, siltation fencing, diversion and control of storm water run-off, ponding areas and similar methods.
- B. Install siltation socks in accordance with manufacturer's recommendations. Deteriorated siltation socks shall be replaced at the direction of the Engineer. Remove and dispose of the siltation socks following the successful growth of vegetation in the areas disturbed by the construction. The removal of the siltation socks will be at the direction of the Engineer. On embankment areas and on flat areas adjacent to wetland areas, the siltation socks shall be installed continuously between the construction site and the wetland area as directed by the Engineer.

#### 3.2 SILTATION FENCE

- A. Install a filter fabric siltation fence in addition to the siltation socks, prior to construction and remove after full surface restoration has been achieved. Install the siltation fence parallel and immediately adjacent to the siltation socks in conformance with the Drawings. Install as follows:
  - 1. Hand shovel excavate a small trench on the upstream side of the desired fence line location.

2. Unroll the siltation fence system, position the post in the back of the trench (downhill side), and hammer the post at least 1½ feet into the ground.
  3. Lay the bottom 6 inches of the fabric into the trench to prevent undermining by storm water run-off.
  4. Backfill the trench and compact. Compaction is necessary to prevent the run-off from eroding the backfill.
- B. Control surface waters within the construction area through the use of temporary culverts or other means.

### 3.3 RESTORATION

- A. Provide temporary stabilization of disturbed areas inactive greater than 14 consecutive days to minimize erosion. Methods to minimize erosion may include but are not limited to:
1. Spreading straw and/or providing temporary planting stabilization.
  2. Installing jute netting.
  3. Preparing surfaces to increase the runoff flow path, reduce the runoff flow velocity, or create small storage pockets to retain surface flows. Methods of accomplishing this include using mechanical devices such as track equipment or sheep's foot rollers.
- B. Restoration of the ground surface in areas that are brush and/or woodlands prior to the start of construction is expected to require machine spreading of existing stripped surface soils (loam and humus), lime, fertilizer, seed and mulch, and jute netting where required by steep slopes.
- C. Salvage existing loam and topsoil and stockpile this material for re-spreading where originally removed. On backfilling, grading shall be returned to preconstruction contours as much as possible and the stockpile of loam shall be spread over areas disturbed during construction activities.
- D. Place approved mulch on seeded areas to help with erosion control. Use jute netting on areas having a slope greater than 3 horizontal to 1 vertical, to anchor the mulch until a satisfactory growth is obtained. If seeding is not possible because of the time of the year, apply mulch and netting to stabilize the area until such time as seed can be sown.
- E. Maintain the restored areas until such time as the Work is accepted by the Owner. Maintenance shall include all grading, refertilizing, reseeding, remulching and/or netting which may be necessary.
- F. Seed shall be as specified under Section 02920.

### 3.4 CLEANING

- A. Remove any sediment that builds up around the siltation socks or catch basins.
- B. Catch basins that collect sediment as a result of the Work shall be thoroughly cleaned.

END OF SECTION



## SECTION 01580

### TEMPORARY BYPASS PUMPING

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Section Includes

1. Temporary bypass pumping

##### 1.2 SUBMITTALS

###### A. Informational Submittals

1. Submit a specific, detailed description of the proposed pumping system.
2. Submit references for prior projects.
3. Submit qualifications of bypass pumping company.
4. Submit detailed plans and descriptions outlining all provisions and precautions to be taken by the Contractor regarding the handling of existing wastewater flows. This plan must be specific and complete, including such items as schedules, locations, elevations, capacities of equipment, materials and all other incidental items necessary and/or required to ensure proper protection of the facilities, including protection of the access and bypass pumping locations from damage due to the discharge flows, and compliance with the requirements specified in the Contract Documents. No construction shall begin until all provisions and requirements have been approved.
5. The drawings shall include but not be limited to details of the following:
  - a. Staging areas for pumps
  - b. Pipe plugging method and types of plugs
  - c. Number, size, material, location and method of installation of suction piping
  - d. Number, size, material, method of installation and location of installation of discharge piping
  - e. Bypass pump sizes, capacity, number of each, and size to be on site and fuel/power requirements
  - f. Calculations of static lift, friction losses, and flow velocity (pump curves showing pump operating range shall be submitted)
  - g. System curve with suction lift performance
  - h. Standby power generator size, location
  - i. Downstream discharge plan

- j. Method of protecting discharge manholes or structures from erosion and damage
- k. Sections showing suction and discharge pipe depth, embedment, select fill and special backfill
- l. Method of noise control for each pump and/or generator
- m. Any temporary pipe supports and anchoring required
- n. Design plans and computation for access to bypass pumping locations indicated on the drawings
- o. Calculations for selection of bypass pumping pipe size
- p. Schedule for installation of and maintenance of bypass pumping lines
- q. A plan showing the location of bypass pumping equipment, and suction and discharge piping

### 1.3 QUALITY ASSURANCE

- A. Employ the services of a company that specializes in the design and operation of temporary bypass pumping systems. Demonstrate that the bypass pumping equipment is automated and is capable of functioning without the assistance of an operator.
- B. Provide at least 5 references of projects of similar size and complexity in wastewater applications performed within the past three years within New England.
- C. The bypass pumping company shall have a minimum experience of 15 years designing and supplying wastewater bypass systems.
- D. Demonstrate sufficient inventory to perform normal rentals, including this project, and maintain at least 100% reserve equipment for this project for immediate delivery.
- E. Demonstrate sufficient service and repair parts in stock to fulfill any service or repair of all rental equipment within 3 hours of any service call.
- F. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.
- G. Obtain required approvals for placement of the temporary pumping equipment and piping system adjacent to the existing main.
- H. No construction shall begin until the related project submittals are approved and all provisions of the work have been coordinated with the Owner and Engineer.

### 1.4 SYSTEM REQUIREMENTS

- A. Design, install, operate, and subsequently remove a temporary bypass pumping system to divert the existing flows around the work area for the duration of the project.

- B. Bypass pumping equipment shall be automated and capable of functioning without the assistance of an operator.
- C. Pumping equipment shall be capable of operating for an extended period of time running dry. After this period of time, the pump shall have the capability of pulling a 25 inch Hg vacuum without adjustment or repair.
- D. The entire bypass system including all pumps, pipe, hose, valves, and fittings shall be provided by one bypass pumping company who is responsible for the operation of the entire system.

## PART 2 PRODUCTS

### 2.1 EQUIPMENT

- A. Pumps shall be centrifugal, end suction, fully automatic self-priming low noise pumps that do not require the use of foot-valves, vacuum pumps, diaphragm pumps, or isolation valves in the priming system. Pumps must be constructed to allow dry running for long periods of time to accommodate the cyclical nature of effluent flow pumps and shall immediately develop 25 inch Hg vacuum without adjustment or repair or employ level control devices to regulate on/off or variable speed of the pump. Hydraulic, submersible, electric, or wellpoint type pumps are prohibited. Pumps shall be low noise sound attenuated, critically silenced units.
- B. Seals shall be high pressure, mechanical self-adjusting type with silicon carbide faces capable of withstanding suction pressures to 100 psi running. The mechanical seal shall be cooled and lubricated in an oil bath reservoir, requiring no maintenance or adjustment. Pump shall be capable of running dry, with no damage, for extended periods of time. All metal parts shall be of stainless steel. Elastomers shall be Viton. Pump end shall be manufactured to meet ISO 9002 certifications.
- C. The primary pumps shall be electric/diesel powered via a temporary electrical service. Temporary electrical service to be provided by the Contractor at his expense.
- D. Back-up pumps and/or standby electric generator system may be fossil fuel engine driven.
- E. Provide the necessary start/stop controls for each pump.
- F. Include one stand-by pump of each size to be maintained on site and a standby power source.
- G. Back-up pumps shall be on-line, isolated from the primary system by a valve.
- H. Pump shall not be connected by a common suction manifold. The use of PVC or Steel Pipe with Dresser Couplings will not be accepted. All pipe or hose will be rated for 25 inch Hg Vacuum.



- I. In order to prevent the accidental spillage of flows, all discharge systems must be constructed of high density polyethylene pipe with fused joints or quick disconnect pipe with positive restrained joints, and leak proof connections. Discharge hose will only be allowed by specific permission of the engineer. PVC pipe with glued joints, aluminum "irrigation pipe", steel pipe or PVC pipe with Dresser couplings will not be accepted. All joints must be 100% restrained. All discharge pipe must have a minimum working pressure of 50 psi. All force main connections shall be made by using flanged composite hose with a working pressure of 150 psi.
- J. Allowable piping materials will be fused, high density polyethylene pipe, acceptable disconnect pipe, or flanged composite pressure class hose. SDR of discharge piping shall be suitable for the calculated discharge pressures. The vendor fusing the pipe must have a minimum of 5 years experience fusing HDPE pipe of the same diameter required for the project.

## 2.2 SYSTEM DESCRIPTION

### A. Design Requirements:

1. Bypass pumping systems shall have sufficient capacity to pump a peak flow equal to the capacity of the existing pipes. The following information is provided for informational purposes only:
  - a. The existing sewer line to be bypassed serves 1 home upstream.
  - b. The existing catch basin storm drain pipes should be relatively low-flowing during dry weather flows.
2. Provide all pipeline plugs, pumps of adequate size to handle peak flow, and temporary discharge piping to ensure that the total flow of the main can be safely diverted around the section to be repaired. Bypass pumping systems will be required to be operated during television and pipe lining operations.
3. Have adequate standby equipment available and ready for immediate operation and use in the event of an emergency or breakdown. One standby pump for each size pump utilized shall be installed at the mainline flow bypassing locations, ready for use in the event of primary pump failure. Also, a back-up power supply source shall be provided.
4. Bypass pumping system shall be capable of bypassing the flow around the work area and of releasing any amount of flow up to full available flow into the work area as necessary for satisfactory performance of work.
5. Make all arrangements for bypass pumping during the time when the pump station is shut down for any reason. System must overcome any line pressure on discharge.

B. Performance Requirements:

1. There must be no interruption in the flow throughout the duration of the Project. Provide, maintain and operate all temporary facilities such as dams, plugs, pumping equipment (both primary and back-up units as required), conduits, all necessary power, and all other labor and equipment necessary to intercept the sewage flow before it reaches the point where it would interfere with the Work, carry it past the Work and return it to the existing pipe downstream of this work.
2. Provide all necessary means to safely convey the flows past the work area. The Contractor will not be permitted to stop or impede the main flows under any circumstances.
3. Maintain flow around the work area in a manner that will not cause surcharging of pipes, damage to pipes and that will protect public and private property from damage and flooding.
4. The bypass system shall not require excavation to reduce the suction lift without the specific approval of the engineer prior to the bid.
5. Protect water resources, wetlands, and other natural resources in accordance with the appropriate project permits.
6. Meet noise limits of 69dbA @ 30 feet. All diesel driven standby pumps and/or back-up power supplies shall be sound attenuated. The use of Critical Silenced Canopy pumps or acoustical enclosures for sound attenuation is required.
7. The pumps shall not be benched down to make the suction lift unless approved by the Engineer prior to bid.

### PART 3 EXECUTION

#### 3.1 PREPARATION

A. Precautions

1. Locating existing utilities in the area where the Contractor selects to locate the bypass pipelines. Locate bypass pipelines to minimize any disturbances to existing utilities and obtain approval of the pipeline locations from the Owner, Engineer, and property owners. Pay all costs associated with relocating utilities and obtaining all approvals.
2. During all bypass pumping operation, protect the existing pipes, pump station, force main, and all pipelines from damage inflicted by any equipment. Be responsible for all physical damage to the existing facilities caused by human or mechanical failure.

#### 3.2 FIELD QUALITY CONTROL AND MAINTENANCE

A. Test:

1. Perform leakage and pressure tests of the bypass pumping discharge piping using clean water prior to actual operation. Give the Engineer 24 hour notice prior to testing.

- B. Inspection:
  - 1. Inspect the bypass pumping system regularly (every 2 hours) to ensure that the system is working correctly.
- C. Maintenance Service:
  - 1. Ensure that the temporary pumping system is properly maintained and a responsible operator is on hand at all times when pumps are operating.
- D. Extra Materials:
  - 1. Keep spare parts for pumps and piping on site as required.
  - 2. Maintain adequate hoisting equipment for each pump and accessories on the site.
- E. INSTALLATION AND REMOVAL
  - 1. Make connections to the existing pipes and construct temporary bypass pumping structures only at locations approved by the submittals.
  - 2. Plugging or blocking of sewage flows shall incorporate primary and secondary plugging device. When plugging or blocking is no longer needed for performance and acceptance or work, it is to be removed in a manner that permits the sewage flow to slowly return to normal without surge, to prevent surcharging or causing other major disturbances downstream.
  - 3. When working inside manhole or force main, exercise caution and comply with OSHA requirements when working in the presence of harmful gases, combustible oxygen-deficient atmospheres, and confined spaces.
  - 4. The pipeline must be located off streets and sidewalks and on shoulders of the roads. When the bypass pipeline crosses local streets and private driveways, the contractor must place the bypass pipelines in trenches and cover with temporary pavement. Adhere to any and all applicable project permits.
  - 5. Upon completion of the bypass pumping operations, and after the receipt of written permission from the Engineer, remove all the piping, restore all structures, pipelines and property to pre-construction condition, and restore all pavement surfaces. Adhere to any and all applicable project permits.

END OF SECTION



## SECTION 01581

### TEMPORARY BYPASS PIPING SYSTEM - WATER

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Temporary potable water bypass piping system
- B. Related Sections
  - 1. Section 02501, Disinfection of Water Distribution Systems
  - 2. Section 02502, Testing of Water Distribution Systems

##### 1.2 SUBMITTALS

- A. Submit a detailed layout of the proposed temporary bypass piping system, including pipe sizes, connections to existing water mains and hydrants, services, temporary hydrants, and valves.
- B. Submit a list of spare materials to remain on the project site throughout construction.
- C. Submit a contact list of those who will be responsible to respond to emergency calls to maintain and repair the temporary bypass and services.

##### 1.3 QUALITY ASSURANCE

- A. Employ the services of a company that specializes in the operation and maintenance of temporary potable water bypass piping systems.
- B. Provide at least 5 references of projects of similar size and complexity in water applications performed within the past three years.
- C. Use equipment of adequate size, capacity, and quantity to accomplish the work of this Section in a timely manner.
- D. The bypass system shall meet the requirements of all codes and regulatory agencies having jurisdiction.
- E. No construction shall begin until the related project submittals are approved and all provisions of the work have been coordinated with the Owner and Engineer.

#### PART 2 PRODUCTS

##### 2.1 MATERIALS

- A. Temporary bypass pipe, valves and fittings shall be 4-inch or 6-inch diameter, unless otherwise indicated on the Drawings. Temporary bypass pipe, valves and fittings shall be plastic or steel and pressure rated for a minimum of 200 psi operating pressure.

- B. Temporary service connections shall be of equal or larger size than the permanent service connections to provide satisfactory water service in terms of quantity, pressure and quality. Temporary service connections shall be a minimum  $\frac{3}{4}$ " diameter. Hose and fittings shall be composed of an inert material that will not impart a taste into the water and pressure rated for a minimum of 200 psi operating pressure.
- C. Temporary fire hydrants shall have  $4\frac{1}{2}$ -inch NST (National Standard Threads) nozzles with caps.
- D. Ramps at driveway crossings shall be pre-fabricated rubber mats formed to fit around the bypass pipe. Stone dust, cold patch or other similar materials will not be permitted.
- E. Only bypass pipe, hoses, fittings, temporary hydrants and valves that are new or were only previously used for the distribution of potable water will be allowed. Pipe, hoses, fittings and valves that were previously used for any other use, including sewage or drainage, will not be allowed.

### PART 3 EXECUTION

#### 3.1 GENERAL

- A. Water for the temporary connection shall be from Owner's nearest available hydrants remaining in service or where indicated on the Drawings.
- B. The Contractor shall have readily available sufficient additional quantity of bypass pipe, valves, connections, lateral and service material of suitable sizes to replace or supplement the temporary facilities in the event these prove inadequate in any way.
- C. The temporary bypass pipe and services shall be maintained until the water main is restored to service. Any interruptions, whether caused by physical damage or otherwise, shall be immediately corrected and the service restored without additional cost by the Owner.
- D. The Contractor will not be allowed to use water from the temporary bypass pipes for any other purpose other than to supply the bypass pipes. Water for filling water tanks, watering lawns, or any other purpose other than supplying water to bypass pipes must be obtained from a hydrant with the Owner's prior approval.
- E. The Contractor shall coordinate and cooperate with the service user and the Owner and local fire department to assure the minimum disturbance to the user's fire protection system and other special and automated use.
- F. The temporary service pipe shall be maintained until the water main is restored to service. Any interruptions, whether caused by physical damage or otherwise, shall be immediately corrected and the service restored without additional cost to the Owner. The bypass pipe shall be valved so that there will be minimum interruption in the system if repairs in the pipe are necessary, but said valves shall be protected from unauthorized operation.

- G. Any work that the Owner performs to repair deficient bypass pipe, temporary services or any work pertaining to the bypass pipe, resulting from non-response from the Contractor, will be charged to the Contractor. This may include time for the Owner's personnel used to investigate the problem.

### 3.2 COORDINATION

- A. The Contractor shall notify the Owner, the Owner's water utility and the local fire department 48 hours in advance of the time of connecting and disconnecting temporary and permanent facilities so that representatives of the Owner's water utility and fire department may be present at installation or removal of permanent and temporary connections.

### 3.3 TEMPORARY BYPASS PIPE INSTALLATION

- A. Install the temporary bypass pipe a few feet off of the roadway in locations where it will cause the least obstruction and will be less likely to be damaged or as shown on the Drawings. If possible, install the bypass pipe on the house-side of the sidewalk. In areas of no sidewalk, the temporary by-pass pipe shall be laid a few feet of the street on the grassed shoulder. If neither of these options are possible, install the bypass pipe within the gutter line along the edge of the roadway.
- B. Where the bypass pipe crosses the road, sawcut a trench across the road to bury the bypass pipe. The bypass pipe shall be covered with a minimum of 1½-inch of temporary hot mix asphalt or cold patch. Maintain barricades with flashers at all road crossings at the point where the bypass is no longer buried.
- C. Where the bypass pipe crosses the sidewalk, sawcut a trench across the sidewalk to bury the bypass pipe. The bypass pipe shall be covered with a minimum of 1½-inch of temporary hot mix asphalt or cold patch.
- D. At driveways, provisions shall be made to permit property owners to drive over the temporary pipe. When using 4-inch piping, this can be accomplished by a pre-fabricated rubber mats formed to fit around the bypass pipe. At certain other driveways (due to existing grades), a narrow trench shall be cut in the paving and the temporary pipe placed 1½-inch below the surface with temporary cold patch. For 6-inch piping, the shallow trench shall be used for all vehicle and/or pedestrian crossings.
- E. Flush the existing hydrant which the bypass is connected to for the temporary water supply prior to making connections to prevent stagnant or discolored water from entering bypass. Connect the temporary bypass piping to the steamer/pumper nozzle.
- F. The bypass pipe shall be valved so that there will be minimum interruption in the system if repairs in the pipe are necessary, but said valves shall be protected from unauthorized operation. Valves shall be provided on both sides of all street crossings. In addition, install mainline valves a maximum of ten (10) houses apart or no more than 500 feet between each valve, whichever is less.

- G. Install temporary hydrants at locations of existing hydrants. The number of temporary hydrants shall be equal to or exceed the number of hydrants existing within that system. Temporary fire hydrants shall have 4½-inch NTS (National Standard Threads) nozzles. Maintain caps on temporary hydrants.
- H. Provide “Out of service” markers on all permanent hydrants while they are out of service for the duration of work. Maintain temporary bypass hydrants and “out of service” signs on the permanent hydrants until the relocated main is in service and all permanent hydrants are completely installed.
- I. Perform leakage and pressure tests of the bypass pumping discharge piping in accordance with Section 02502. Give the Engineer 24 hour notice prior to testing.
- J. Flush and sterilize all temporary pipe to prevent contamination in accordance with Section 02501. Total coliform bacteria testing will be required prior to activation of bypass lines. Provide lab reports from a certified laboratory for all tests conducted.

#### 3.4 CLEAN UP

- A. Upon completion of the new water main, remove all corresponding temporary service pipes and connections, satisfactorily restore the permanent connections and leave the streets, sidewalks and ground surfaces in a neat and orderly condition, at least equal to that prevailing before the work was started.

#### 3.5 EMERGENCY CONTACT

- A. Designate a permanent company employee to maintain the bypass and services. Contractor shall supply the Owner with applicable emergency and after hours phone numbers. All bypass breaks and problems reported to the Owner or local police department will result in the callout of the employee designated for maintenance.

#### 3.6 EMERGENCY SHUTDOWN

- A. In the event of a rupture of a water main, service, temporary bypass pipe, temporary service or other failure, whether the result of the Contractor’s activities or other unrelated matters, immediately notify the Owner, local fire department, and local police department and inform them of the situation, affected area, proposed duration and the need for an immediate water main shutdown.
- B. Immediately notify all affected residents.

#### 3.7 PLANNED SHUTDOWNS AND NOTIFICATIONS

- A. Notify the Owner and Engineer in writing of the proposed shutdown of any water main and approximate duration thereof a minimum of three (3) days in advance. Include date, time and extent of duration of shutdown.



- B. Notify all consumers, in writing, two separate times, the first being one week prior to the scheduled shutdown and the second notification being twenty four (24) hours prior to the scheduled shutdown. Each notification shall include the date of the shutdown, the anticipated duration, reason and Contractor's emergency contact information.
- C. Immediately prior to individual service work, notify the consumer again to verify that all water use will temporarily be stopped.
- D. Contractor shall bear the full responsibility of any loss or damage arising out of the failure of any such customer to receive the notice of proposed shutdown or interruption of service.

END OF SECTION

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## SECTION 01600

### PRODUCT REQUIREMENTS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Products and Materials
  - 2. Product Delivery Requirements
  - 3. Packaging, Handling and Storage Requirements
  - 4. Inspection of Offsite Work

##### 1.2 QUALITY ASSURANCE

- A. Review all contract Drawings and Specifications with respect to specific system characteristics, applicability of materials and equipment for the intended purposes, sizes, orientation, and interface with other systems, both existing and proposed, and certify that the materials and equipment proposed will perform as specified prior to submitting shop drawings.
- B. Provide sworn certificates as to quality and quantity of materials where specified or requested by the Engineer.
- C. Obtain concurrence of the Engineer prior to processing, fabricating, or delivering material or equipment.

##### 1.3 PRODUCTS AND MATERIALS

- A. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by a single manufacturer unless specified otherwise.
- B. Use only new and first quality material in the Work. Material shall conform to the requirements of these Specifications and be approved by the Engineer. If, after trial, it is found that sources of supply that have been approved do not furnish a uniform product, or if the product from any source proves unacceptable at any time, the Contractor shall furnish approved materials from other approved sources.
- C. Immediately remove defective materials and equipment from the site, at no additional cost to the Owner. The Contractor may be required to furnish sworn certificates as to the quality and quantity of materials before materials are incorporated in the Work.
- D. Engineer has the right to approve the source of supply of all material prior to delivery.

##### 1.4 PRODUCT DELIVERY REQUIREMENTS

- A. Transport and handle products in accordance with manufacturer's instructions.

- B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.
- D. Progressively deliver materials and equipment to the Site so there will be neither delay in progress of the Work nor an accumulation of material that is not to be used within a reasonable time.
- E. Deliver products to the Site in their manufacturer's original container, with labels intact and legible.
  - 1. Maintain packaged materials with seals unbroken and labels intact until time of use.
  - 2. The Engineer may reject as non-complying such material and products that do not bear identification satisfactory to the Engineer as to the manufacturer, grade, quality, source, and other pertinent information.

#### 1.5 PACKAGING, HANDLING AND STORAGE REQUIREMENTS

- A. Provide storage and handling of all materials and equipment required for the Work.
- B. Except as otherwise indicated in the Contract Documents, determine and comply with the manufacturer's recommendations on product storage, handling, and protection. Provide manufacturer's documentation on recommended storage procedures when requested by the Engineer.
- C. Properly store and protect all equipment immediately upon its arrival. All equipment shall be stored in a clean, dry, heated, secured, and insured indoor facility satisfactory to the Engineer. Equip drive motors with thermostatically controlled strip heaters. Outdoor storage with plastic, canvas, plywood or other cover will not be allowed except where specific approval for designated items not containing electrical components or bearings is obtained from the Engineer. This approval does not relieve the Contractor of responsibility for proper protection of materials.
- D. Familiarize workmen and subcontractors with hazards associated with materials, equipment, and chemicals specified herein and take all necessary safety precautions.
- E. Areas available on the construction site for storage of material and equipment shall be as shown on the Drawings or approved by the Owner.
- F. Materials and equipment to be incorporated in the Work shall be handled and stored by the manufacturer, fabricator, supplier, and Contractor before, during and after shipment in a manner to prevent warping, twisting, bending, breaking, chipping, rusting, and any injury, theft, or damage of any kind to the material or equipment.
- G. Protect finished surfaces including floor surfaces, stairs, joints, and soffits of passageways from damage until accepted by the Engineer.

- H. Promptly remove materials from the site of the Work which have become damaged or are unfit for the use intended or specified. The Contractor will not be compensated for the damaged materials or their removal costs.
- I. Handle, haul, and distribute all materials and all surplus materials on the different portions of the Work, as necessary or required. Provide suitable and adequate storage room for materials and equipment during the progress of the Work, and be responsible for the protection, loss of, or damage to materials and equipment furnished, until the final completion and acceptance of the Work.
- J. Storage and demurrage charges by transportation companies and vendors shall be borne by the Contractor.
- K. All materials and equipment to be incorporated in the Work shall be placed so as to not damage any part of the Work or existing facilities and so that free access can be had at all times to all parts of the Work and to all public utility installations in the vicinity of the Work. Keep materials and equipment neatly piled and compactly stored in such locations as will cause a minimum of inconvenience to the Owner.
- L. No material or equipment will be permitted to be stored in any of the Owner's facilities, unless otherwise approved by the Engineer.
- M. Do not store material or equipment in any wetland or environmentally sensitive area. Stockpile sites shall be level, devoid of mature stands of natural vegetation, and removed from drainage facilities and features, wetlands, and stream corridors.
- N. Contractor shall be fully responsible for loss or damage to stored materials and equipment.
- O. No item judged rusty, corroded or otherwise damaged during storage will be accepted. Any electrical or instrumentation item determined by the Engineer to be damaged shall be removed from the Site and replaced by a completely new item in first class condition. Items not properly stored will not be considered for any partial payment.
- P. Provide protective and preventive maintenance during storage consisting of manually exercising equipment where required, inspecting mechanical surfaces for signs of corrosion or other damage, lubricating, applying any coatings as recommended by the equipment manufacturer as necessary for its protection and other precautions as necessary to assure proper protection of equipment stored.
- Q. Treat ferrous surfaces not receiving finish coats of paint with rust preventive coating, and protect non-ferrous metal work and devices with suitable wrappings.

#### 1.6 INSPECTION OF OFFSITE WORK

- A. The Owner and Engineer will inspect Work performed away from the construction site during fabrication, manufacture, or testing, or before shipment. Give 2 weeks written notice regarding the place and time where such fabrication, manufacture, testing, or shipping will be done.



PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

## SECTION 01630

### PRODUCT SUBSTITUTION DURING CONSTRUCTION

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Product substitution procedures

##### 1.2 CONTRACTOR'S OPTIONS

- A. For materials or equipment (hereinafter products) specified only by performance or reference standard, select product meeting that standard, by any Supplier. To the maximum extent possible, provide products of the same generic kind from a single source.
- B. For products specified by naming several products or manufacturers, select any one of the products or Suppliers named, which fully complies with the Drawings and Specifications. Another "or-equal" product can also be considered by the Engineer if it complies with the provisions of Article 6.05, Section 00700. If a product proposed by the Contractor does not qualify as an "or-equal" item, then it can be considered as a proposed substitute item, and the Contractor must comply with the requirements of Article 6.05.A.2, Section 00700.
- C. For products specified by naming products or manufacturers and followed by words indicating that no "or-equal" item or substitution is permitted, there is no option and no substitution will be allowed.
- D. Where more than one choice is available as a Contractor's option, select product that is compatible with other products already selected or specified.

##### 1.3 SUBSTITUTIONS

- A. If in the Engineer's sole discretion a product proposed by the Contractor does not qualify as an "or-equal" item under the provisions of Article 6.05.A.1 of Section 00700, it can be considered a proposed substitute item. Submit information required under Article 6.05.A.2, Section 00700 for proposed substitutes.
- B. The Engineer will consider written requests from the Contractor for substitutions within 30 days after the Notice to Proceed. After this period, requests will be considered only in case of unavailability of product or other conditions beyond control of the Contractor.

- C. Submit 5 copies of request for substitutions. Submit a separate request for each proposed substitution. In addition to the submittal requirements outlined in Article 6.05.A.2 of Section 00700, include the following in each substitution request:
  - 1. For products or Suppliers:
    - a. Product identification, including Supplier & manufacturer's name and address.
    - b. Manufacturer's literature with product description, performance and test data, and reference standards.
    - c. Samples, if appropriate.
    - d. Name and address of similar projects on which product was used, and date of installation.
  - 2. For construction methods (if specified):
    - a. Detailed description of proposed method.
    - b. Drawings illustrating method.
  - 3. Such other data as the Engineer may require to establish that the proposed substitution is equal to the product, Supplier or method specified.
- D. The substitution request shall include written certification and statements that are outlined in Article 6.05.A.2 of Section 00700.
- E. A request constitutes a representation that Contractor:
  - 1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
  - 2. Will provide same or better guarantees, warranties or bonds for proposed substitution as for specified product.
  - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
  - 4. Waives all claims for additional costs or time extension which may subsequently become apparent.
  - 5. Will reimburse Owner for review or redesign services associated with re-approval by authorities having jurisdiction.
- F. A proposed substitution will not be accepted if:
  - 1. Acceptance will require changes in the design concept or a substantial revision of the Contract Documents.
  - 2. It will delay completion of the Work.
  - 3. It is intended or implied on a Shop Drawing and is not accompanied by a formal request for substitution from the Contractor.



- G. The Contractor is responsible for all costs relating to substitution requests.
- H. Approval of a substitution does not relieve the Contractor from the requirement for submission of Shop Drawings as set forth in the Contract Documents.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION





## SECTION 01720

### FIELD ENGINEERING

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Section Includes

1. Establishment of lines, benchmarks, and elevations required to layout and construct the Work
2. Property line survey and delineation

##### 1.2 SUBMITTALS

###### A. Informational Submittals

1. Submit the qualifications of the Registered Professional Engineer and/or Registered Land surveyor to be hired to perform various portions of the Work, as applicable.
2. Submit documentation verifying the accuracy of field engineering work.
3. Submit 4 copies of final record drawings of field engineering layouts and as-built survey.
4. Submit certificate signed by registered (licensed) engineer or surveyor certifying that elevations and locations of Work are in conformance with Contract Documents. Explain deviations.

##### 1.3 RECORDS

- ###### A. Maintain a complete, accurate log of control and survey work as it progresses.

##### 1.4 QUALITY ASSURANCE

- ###### A. Employ a qualified engineer, registered with the Commonwealth of Massachusetts as a Professional Engineer or a competent surveyor, registered with the Commonwealth of Massachusetts as a Land Surveyor, as required for the particular characteristics of the work being performed.

#### PART 2 PRODUCTS - NOT USED

#### PART 3 EXECUTION

##### 3.1 PROCEDURES

- ###### A. The Registered Professional Engineer or Land Surveyor provided shall establish and maintain lines, elevations and reference marks needed during the progress of the Work and shall re-establish stakes and marks placed by the Engineer that are lost or destroyed through the course of the Work. Verify such work by instrument or other appropriate means.

- B. The Engineer shall be permitted at all times to check the lines, elevations and reference marks, set by the Contractor, who shall correct any errors disclosed by such check. Such a check shall not be construed to be an approval of the Contractor's work and shall not relieve or diminish the responsibility of the Contractor for the accurate and satisfactory construction and completion of the entire Work.
- C. Make, check, and be responsible for measurements and dimensions necessary for the proper construction of and the prevention of misfittings in the Work.
- D. Furnish all protective stakes and temporary structures for marking and maintaining points and lines for the building of the Work, and give the Engineer such facilities and materials for verifying said lines and points as he may require.
- E. Revisions to the layout and elevations of the Work as defined by the Contract Documents shall be approved by the Engineer.
- F. Maintain and prepare final record drawings of field engineering layouts and as-built survey conducted after completion of the Work.

END OF SECTION

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## SECTION 01725

### PRESERVATION AND RESTORATION OF PROJECT FEATURES

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Section Includes

1. Protection and replacement of trees, shrubs, signs, property markers, fences, and related project features.
2. Taking precautions, providing programs, and taking actions necessary to protect public and private property and facilities from damage.

##### 1.2 DEFINITIONS

###### A. Underground Structures

1. Underground structures are defined to include, but not be limited to, sewer, water, gas, and other piping, and manholes, chambers, electrical and signal conduits, tunnels and other existing subsurface work located within or adjacent to the limits of the Work.
2. Underground structures known to the Engineer are shown on the Drawings to the extent that locations are available. This information is shown for the assistance of the Contractor in accordance with the best information available, but is not guaranteed to be correct or complete. The Contractor shall be responsible for checking on the actual locations of water, sewer, gas electric and telephone service connection lines to avoid potential interferences.

###### B. Surface Structures

1. Surface structures are defined as existing buildings, structures and other facilities above the ground surface. Included with such structures are their foundations or any extension below the surface. Surface structures include, but are not limited to, buildings, tanks, walls, bridges, roads, dams, channels, open drainage, piping, poles, wires, posts, signs, markers, curbs, walks and all other facilities that are visible above the ground surface.

#### PART 2 PRODUCTS – NOT USED

#### PART 3 EXECUTION

##### 3.1 REPAIR/RESTORATION

- ###### A.
- Trees, shrubs, and similar items shall not be removed except where approved by the Engineer. Items to be removed shall be clearly marked as directed by the Engineer. If objects not to be removed are damaged or removed, they shall be repaired or replaced to their original condition.

- B. Trees and shrubs on private property, which are removed or damaged by the Contractor shall be replaced in kind.
- C. Signs, fences, property markers, walls, guard rails and other public or private property shall be replaced in kind if damaged. Supports and protective devices required shall be provided.
- D. Underground and Surface Structures
  - 1. In the event of damage, injury or loss to existing utilities and structures, whether shown on the Drawings or not, make all reasonable efforts to facilitate repairs and to mitigate the impact of such events upon the utility or structure owner's normal operations. Restore the existing utility or structure to the condition required by the owner of the utility or structure or at least to the condition found immediately prior to the Work. In the event that the utility owner elects to make the repairs, provide all reasonable access and assistance, and reimburse the utility owner for the cost of repairs. If utility service is interrupted due to damage to facilities, alternate facilities shall be provided.
  - 2. All other existing surface facilities, including but not limited to, guard rails, posts, guard cables, signs, poles, markers and curbs which are temporarily removed to facilitate the Work shall be replaced and restored to their original condition at the Contractor's expense unless otherwise indicated in other sections of these specifications.
  - 3. Wherever water, sewer, gas or petroleum mains, electric or telephone lines, cables or other utilities and structures are encountered and may be in any way interfered with, inform the Engineer and the appropriate utility company. Cooperate with the Engineer and utility company in the protection, removal, relocation, and replacement of structures and facilities.
  - 4. Prior to proceeding with any construction, notify in writing owners of utilities and structures within the vicinity of the proposed Work.
  - 5. Work affecting water distribution systems, which will take fire hydrants out of service, must be coordinated with the local fire department. The Contractor shall be prepared to restore fire flows in the event of an emergency or to provide for temporary fire flow service in accordance with the requirements of the local fire department.
  - 6. Materials used for relocation or replacement of utilities and structures shall be of an equivalent material, type, class, grade and construction as the existing or as approved by the respective owners thereof, unless otherwise shown or specified.

7. When any survey monument or property marker, whether of stone, concrete, wood or metal, is in the line of any trench or other construction work and may have to be removed, notify the Engineer in advance of removal. Under no circumstances shall any monument or marker be removed or disturbed by the Contractor or by any of his Subcontractors, employees or agents, without the permission of the Engineer. Monuments or markers removed or disturbed shall be reset by a land surveyor licensed in the State where the Work is located at the Contractor's expense. Should any monuments or markers be destroyed through accident, neglect or as a result of the Work under this Contract, the Contractor shall, at his own expense, employ a land surveyor licensed in the State where the Work is located to re-establish the monument or marker.

### 3.2 PROTECTION

- A. The construction of certain portions of the project may require excavation within the root systems of trees. Roots with a diameter of 2 inches or more within the excavation shall not be cut. If necessary, excavation shall be made with small powered equipment or by hand to comply with this requirement. It may be necessary to excavate from more than one direction to avoid damage to the roots.
- B. The trunks of trees that are to remain and are within the swing radius of the excavating machine bucket when fully extended shall be wrapped with burlap and 2-inch by 4-inch protective wood slats (8 inch spacing maximum) wired around the circumference of the trees to protect them from damage.
- C. Tree limbs shall not be cut except upon written approval of the Owner and the Engineer. Tree limbs cut shall be painted with approved forestry paint manufactured specifically for that purpose.
- D. Underground and Surface Structures
  1. Sustain in their places and protect from direct or indirect injury underground and surface structures within or adjacent to the limits of the Work. Such sustaining and supporting shall be done carefully and as required by the party owning or controlling such structure. Before proceeding with the work of sustaining and supporting such structure, satisfy the Engineer that the methods and procedures to be used have been approved by the party owning same.
  2. Pay utility service company charges related to the temporary support of utility poles if required to complete the Work.
  3. Assume risks associated with the presence of underground and surface structures within or adjacent to the limits of the Work. The Contractor shall be responsible for damage and expense for direct or indirect injury caused by his Work to any structure. Immediately repair damage caused by the Work to the satisfaction of the owner of the damaged structure.



END OF SECTION

## SECTION 01770

### CLOSEOUT PROCEDURES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Documentation required for the transfer of the completed Work to the Owner
  - 2. Final Cleaning

##### 1.2 SUBMITTALS

- A. Closeout Submittals
  - 1. Evidence of payment and release of liens
  - 2. List of Subcontractors, service organizations, and principal vendors

##### 1.3 SUBSTANTIAL COMPLETION

- A. Refer to Article 14.04 in 00700, General Conditions, for procedures relating to obtaining Substantial Completion. Refer to 00520, Agreement, for Contract Times.

##### 1.4 PROJECT CLOSEOUT DOCUMENTS

- A. Provide warranties and bonds for items so listed in pertinent sections of the Project Manual.
- B. Provide evidence of compliance with requirements of governmental agencies having jurisdiction.
- C. Provide evidence of payment and release of liens.
- D. Provide list of Subcontractors, service organizations, and principal vendors, including names, addresses, and telephone numbers where they can be reached for emergency service at all times including nights, weekends, and holidays.

##### 1.5 FINAL PAYMENT

- A. Refer to Article 14.06 and 14.07 in 00700, General Conditions, for procedures relating to final inspection and payment.
- B. The Contract shall be considered complete and final payment made, only when:
  - 1. All provisions of the Contract Documents have been strictly adhered to.
  - 2. The project and premises have been left in good order, including removal of all temporary construction, Contractor-owned and extraneous materials.



PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 CLEANING

- A. Remove and entirely dispose of material or debris that has washed, flowed or has been placed in existing watercourses, ditches, gutters, drains, pipe, or structures, for work done under the Contract work limits. Leave ditches, channels, drains, pipes, structures, and watercourses in a clean and neat condition upon completion of the Work.
- B. Restore or replace any public or private property damaged or removed during the course of the Work. Property shall be returned to a condition at least equal to that existing immediately prior to the beginning of operations. Complete all highway or driveway, walk, and landscaping work using suitable materials, equipment and methods. Perform restoration of existing property, signs or structures promptly as work progresses; do not leave restoration work until the end of the Contract Time.

END OF SECTION

## SECTION 02075

### GEOSYNTHETICS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section includes
  - 1. Non-woven geotextiles
  - 2. Permanent non-degradable erosion control blankets

##### 1.2 REFERENCES

- A. Data Sheet DS1 - Non-Woven Geotextiles
- B. ASTM D3786 - Test Method for Hydraulic Bursting Strength of Knitted Goods and Non-woven Fabrics: Diaphragm Bursting Strength Tester Method
- C. ASTM D4491 - Test Methods for Water Permeability of Geotextiles by Permittivity
- D. ASTM D4533 - Test Method for Trapezoid Tearing Strength of Geotextiles
- E. ASTM D4632 - Test Method for Grab Breaking Load and Elongation of Geotextiles
- F. ASTM D4751 - Test Method for Determining the Apparent Opening Size of a Geotextile
- G. ASTM D4833 - Test Method for Index Puncture Resistance of Geotextiles Geomembranes and Related Products
- H. ASTM D5261 - Test Method for Measuring Mass per Unit Area of Geotextiles

##### 1.3 SUBMITTALS

- A. Product data for all geosynthetics proposed for use on this project.
- B. Manufacturer-approved construction quality assurance/quality control manual for all of the geosynthetics proposed for use on this project.
- C. Manufacturing quality control testing data specified. Submit certification of required performance testing on all geosynthetics by an independent laboratory and label and identify all geosynthetic products delivered to the site.
- D. Manufacturer's recommended installation and fastening details for the erosion control blankets. The following details are required:
  - 1. Typical stapling pattern and spacing. List staple density in terms of staples per square yard.
  - 2. Anchoring details for channels and slopes.
  - 3. Transverse blanket lap splice details, as well as longitudinal lap splice details if parallel blankets are to be installed.

4. Termination details for the origin and termination of the channels and slopes.

#### 1.4 QUALITY ASSURANCE

- A. Obtain from the geosynthetic product manufacturers a warranty that their products are free from defects in materials and workmanship at the time of delivery to the project site.
- B. Material found to be defective or which does not conform to these specifications will be rejected.

#### 1.5 DELIVERY, STORAGE AND PROTECTION

- A. The Engineer reserves the right to reject and require replacement of any damaged materials delivered to the site, at no additional cost to the Owner.
- B. Stockpile and store the materials in accordance with the manufacturer's recommendations.
- C. Label and bag all geosynthetic rolls in packing that is resistant to photo degradation by ultraviolet (UV) radiation.

### PART 2 PRODUCTS

#### 2.1 MANUFACTURERS

- A. Group 2 Non-Woven Geotextile
  1. "4506" as manufactured by Amoco Fabrics and Fibers
  2. "FX-60HS" as manufactured by Carthage Mills
  3. "160N" as manufactured by Mirafi Inc.
  4. Or equal
- B. Permanent Non-Degradable Erosion Control Blankets
  1. "P300" as manufactured by North American Green
  2. "LANDLOK TRM 450" as manufactured by SI Geosolutions, Inc.,
  3. Or equal

#### 2.2 MATERIALS

- A. Non-woven geotextiles shall be manufactured from a continuous polypropylene filament. A needle punching process shall achieve bonding.
- B. Permanent, non-degradable ECBs shall consist of a three-dimensional matrix of UV-stabilized polypropylene encased between two polypropylene nets. The blanket shall be cross-stitched on two inch centers maximum with polypropylene thread
  1. Each of the polypropylene nets shall have a mass per unit area of at least three pounds per one thousand square feet.

2. Permanent, non-degradable ECBs shall be recommended by the manufacturer for use on 1:1 slopes and in drainage channels, and shall have a minimum, limiting shear stress of eight pounds per square foot, measured over 50 hours.

### PART 3 EXECUTION

#### 3.1 EXAMINATION

- A. Inspect all products prior to the installation for any defects that may have been the result of storage and handling. The Engineer reserves the right to reject and require replacement of any damaged product, at no additional cost to the Owner.

#### 3.2 INSTALLATION

- A. Install geosynthetic products in accordance with the approved manufacturer's QA/QC manuals, project details, and pertinent sections of these Specifications.

#### 3.3 QUALITY CONTROL

- A. The Engineer may remove a sample (i.e. a strip that is 3 feet long by the entire roll width) from a maximum of 1 roll of each 10 rolls of all geosynthetic materials delivered to the project, and submit the samples to an independent laboratory for analysis of the product to ensure that the geosynthetics meet the specifications herein.

END OF SECTION

(DATA SHEETS FOLLOW)

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Data Sheet DS1 - Non-Woven Geotextile Mechanical Properties								
Property	Test Method	Units	Testing Frequency	Value				
				Group 1	Group 2	Group 3	Group 4	Group 5
Mass per Unit Area	ASTM D5261	oz/yd <sup>2</sup>	1/150,000 ft <sup>2</sup>	4	6	8	12	16
AOS	ASTM D4751	US Sieve	1/150,000 ft <sup>2</sup>	70	70	100	100	100
Permittivity	ASTM D4491	gal/min/ft <sup>2</sup>	1/150,000 ft <sup>2</sup>	140	90	80	70	50
Puncture Strength	ASTM D4833	lbs	1/150,000 ft <sup>2</sup>	60	90	130	195	245
Mullen Burst Strength	ASTM D3786	lbs/in <sup>2</sup>	1/150,000 ft <sup>2</sup>	225	350	400	650	800
Trapezoidal Tear Strength	ASTM D4533	lbs	1/150,000 ft <sup>2</sup>	35	65	80	115	145
Grab Tensile/Elongation	ASTM D4632	lbs(%)	1/150,000 ft <sup>2</sup>	95 (50)	150 (50)	200 (50)	300 (50)	400 (50)

## SECTION 02200

### SITE PREPARATION

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section includes
  - 1. Clearing and grubbing
  - 2. Grading
  - 3. Stripping and stockpiling of soil and sod

##### 1.2 SUBMITTALS

- A. Submit construction methods and equipment that will be utilized for the clearing, grubbing, and waste material disposal specified within this Section.

#### PART 2 PRODUCTS – NOT USED

#### PART 3 EXECUTION

##### 3.1 CLEARING AND GRUBBING

- A. Except as otherwise directed, cut, grub, remove and dispose of all trees, stumps, brush, shrubs, roots and any other objectionable material within the limits of the Work on the site and where required to construct the work.
- B. Protect trees or groups of trees, designated by the Engineer to remain, from damage by all construction operations by erecting suitable barriers, or by other approved means. Conduct clearing operations to prevent falling trees from damaging trees designated to remain.
  - 1. All damage done to the trees by the Contractor's operation shall be trimmed and painted where cut as directed or as necessary to provide adequate vertical clearance for construction activities. The dressing or paint shall be applied no later than two days after the cuts are made.
  - 2. Use all necessary precautions to prevent injury to other desirable growth in all areas. Contractor shall assume full responsibility for any damage.
- C. Protect areas outside the limits of clearing from damage. No equipment or materials shall be stored in these areas.
- D. No stumps, trees, limbs, or brush shall be buried in fills or embankments.

##### 3.2 DISPOSAL OF MATERIALS

- A. Remove all tree trunks, limbs, roots, stumps, brush, foliage, other vegetation and objectionable material from the site and dispose of in a legal manner.
- B. Burning or direct burial of cleared and grubbed materials on-site will not be permitted.

### 3.3 GRADING

- A. In preparation for placing loam, paved drives and appurtenances, perform grading to the lines, grades and elevations shown on the Drawings, and otherwise directed by the Engineer and perform in such a manner that the requirements for formation of embankments can be followed. All material encountered, regardless of its nature, within the limits indicated, shall be removed and disposed of as directed. During the process of grading, maintain the subgrade in such condition that it will be well drained at all times. Install temporary drains and drainage ditches to intercept or divert surface water that may affect the work when necessary.
- B. If at the time of grading it is not possible to place material in its final location, stockpile material in approved areas for later use. No extra payment will be made for the stockpiling or double handling of excavated material.
- C. The right is reserved to make minor adjustments or revisions in lines or grades if found necessary as the work progresses.
- D. Stones or rock fragments larger than 4 inches in their greatest dimensions will not be permitted in the top 12 inches of the finished subgrade of all fills or embankments except along the access roadways and rip-rap where shown on the Drawings.
- E. In cuts, loose or protruding rocks on the excavated slopes shall be barred loose or otherwise removed to line or finished grade of slope. Cut and fill slopes shall be uniformly dressed to the slope, cross-section and alignment shown on the Drawings or as directed by the Engineer.

### 3.4 DUTCH ELM WOOD

- A. Dutch Elm diseased wood shall be disposed of in accordance with any local regulations.
- B. Where the work includes the removal of elm trees or the limbs of elm trees, such trees or limbs thereof shall be disposed of immediately after cutting or removal and in such a manner as to prevent the spread of Dutch Elm disease. This shall be accomplished by covering them with earth to a depth of at least 6 inches in areas outside the right-of-way locations where the Contractor has arranged for disposal.
- C. Where the work includes the removal and disposal of stumps of elm trees, such stumps shall be completely disposed of immediately after cutting in the manner specified above.

### 3.5 CLEANING UP

- A. During construction, maintain the Project Site and adjacent areas clean and free of all rubbish, debris, surplus materials and unnecessary construction equipment.

- B. Where material or debris has washed, flowed or in any way accumulated in watercourses, ditches, gutters, drains, pipes or structures during the course of the Contractor's operations, such material or debris shall be entirely removed and satisfactorily disposed of as necessary, and upon completion of the work shall be cleaned, flushed and left in neat conditions to the satisfaction of the Engineer.
- C. Restore or replace, when and as directed, any public or private property damaged by the Work to a condition at least equal to that existing immediately prior to the beginning of operations. All drainage structures, curbstones, signs, guardrails, fences and stone walls which are removed or damaged as a result of the work under this contract shall be reset or replaced as required.

END OF SECTION

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## SECTION 02210

### SUBSURFACE INVESTIGATIONS

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Section Includes

1. Soils subsurface investigation at the site, the use of data resulting from the investigation, and conditions warranting additional soils investigation.
2. Pipe and utility subsurface investigations that are required in order to properly locate, plan for and/or connect to the various existing pipelines.

###### B. Related Sections

1. Section 00300 – Geotechnical Data
2. Section 02920 - Lawns and Grasses
3. Section 02315 - Excavation, Backfill, Compaction, and Dewatering
4. Section 02740 - Bituminous Concrete Pavement

##### 1.2 REFERENCES

- A. 29 CFR Part 1926 Subpart P - OSHA Excavation Regulations 1926.560 through 1926.562 including Appendices A through F
- B. MGL Chapter 82 Section 40

##### 1.3 QUALITY ASSURANCE

- A. The entire test pit excavation must be observed by the Engineer.

##### 1.4 SITE CONDITIONS

###### A. Soils Investigation

1. Copies of the soil boring logs are included in Section 00300. Exploration locations are shown on the Drawings.
2. Use of the Data
  - a. The Drawings indicate conditions as they are believed to exist based upon limited subsurface explorations. Investigations and field tests must be conducted to verify the conditions that exist which may affect the Work. All investigations must be conducted under the Engineer's observation.

###### B. Pipeline and Utility Investigations

1. The Drawings show available data relative to existing underground pipe and utilities.

## PART 2 PRODUCTS - NOT USED

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Obtain all available information on buried structures and utilities in the vicinity of the investigation.
- B. Coordinate Work such that all affected property, structure, and utility owners are aware of the Work prior to its commencement.
- C. Schedule subsurface investigations such that they do not interfere with other Work or traffic and in advance of other Work in that location.
- D. Provide the Engineer with 24-hour notice prior to commencement of subsurface investigations.

### 3.2 SUBSURFACE INVESTIGATIONS

- A. Prior to test pitting operations, delineate the general scope of the excavation or boring on the paved surface of the ground using white paint, or stakes or other suitable white markings on non-paved surfaces and coordinate with the appropriate agencies in accordance MGL Chapter 82 Section 40. Pre-marking will not be acceptable if such marks can interfere with traffic or pedestrian control or are misleading to the general public.
- B. Excavate test pits as indicated, or as requested by the Owner. Expose the top of the pipeline, and adjacent utilities, at each test pit location.
- C. Contactor may, at his expense and with permission by the Owner, perform additional explorations not ordered by the Engineer.
- D. Perform test pits in accordance with the requirements of Section 02315. Excavate the bottom 2 feet of the test pit (or in close proximity to known or anticipated utilities) by hand. Excavate to top of pipelines by hand. Test pits shall be braced, sheeted and dewatered or as otherwise required for safe excavation and examination of the structure or utility to be exposed.
- E. Measure the depth to the top of the pipeline, as well as to adjacent utilities, from the ground surface, at each test pit location. Record location, depth and size of pipelines and utilities uncovered during the test pits. Record any other pertinent information which is learned as a result of excavating the test pit.
- F. Excavate test pits of an appropriate size with equipment suitable for the location and character of the pit to be excavated.
- G. All subsurface investigations shall be conducted in accordance 29 CFR Part 1926 Subpart P - OSHA Excavation Regulations 1926.650 through 1926.652 including Appendices A through F.
- H. After observation by the Engineer, backfill and compact the test pits in accordance with Section 02315.
- I. Borings or other drilled probes shall be filled in their entirety with grout upon completion.



- J. Repair damage to any structure, utility, or private or public property or Site feature damaged during the Work to the satisfaction of the Engineer.
- K. Repair paved surfaces in accordance with Section 02740.
- L. Repair lawn areas or grass surfaces in accordance with 02920.

END OF SECTION

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## SECTION 02315

### EXCAVATION, BACKFILL, COMPACTION AND DEWATERING

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Excavation, backfill and compaction for subsurface utilities
  - 2. Removal, handling and disposal of rock
  - 3. Temporary dewatering systems
- B. Related Sections
  - 1. Section 01570 - Temporary Controls
  - 2. Section 02210 - Subsurface Investigations
  - 3. Section 02320 - Borrow Materials

##### 1.2 REFERENCES

- A. ASTM D1557-07 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>))
- B. ASTM D1556-07 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
- C. ASTM D2487-06e1 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- D. ASTM D6938-08a - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- E. 29 CFR Part 1926 Subpart P - OSHA Excavation Regulations 1926.650 through 1926.652 including Appendices A through F
- F. 520 CMR 14.00 Excavation and Trench Safety
- G. 780 CMR 1705.0 Requirements for Structural Tests and Inspections
- H. Commonwealth of Massachusetts Highway Department "Standard Specifications for Highways and Bridges," 1988 Edition as amended

##### 1.3 DEFINITIONS

- A. Benching - A method of protecting employees from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

- B. Earth Retention Systems - Any structural system, such as sheeting and bracing or cofferdams, designed to retain in-situ soils in place and prevent the collapse of the sides of an excavation in order to protect employees and adjacent structures.
- C. Excavation - Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.
- D. Protective System - A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include earth retention systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.
- E. Registered Professional Engineer - A person who is registered as a professional engineer in the state where the work is to be performed. However, a professional engineer, registered in any state is deemed to be a "registered professional engineer" within the meaning of this standard when approving designs for "manufactured protective systems" or "tabulated data" to be used in interstate commerce.
- F. Shield System - A structure that is designed to withstand the forces imposed on it by a cave-in and thereby protects employees within the structure. Shields can be permanent structures or can be designed to be portable and moved along as work progresses. Additionally, shields can be either pre-manufactured or job-built in accordance with 29 CFR 1926.652(c)(3) or (c)(4). Shields used in trenches are usually referred to as "trench boxes" or "trench shields."
- G. Sloping - A method of protecting employees from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.
- H. Temporary Dewatering System – A system to lower and control water to maintain stable, undisturbed subgrades at the lowest excavation levels. Dewatering shall be provided for all pipelines, structures and for all other miscellaneous excavations.
- I. Trench - A narrow excavation (in relation to its length) made below the surface of the ground, of at least three feet in depth. In general, the depth is greater than the width, but the width of a trench (measured at the bottom) is not greater than 15 feet (4.6 m).

#### 1.4 SUBMITTALS

- A. Drawings and calculations for each Earth Retention System required in the Work. The submittal shall be in sufficient detail to disclose the method of operation for each of the various stages of construction required for the completion of the Earth Retention Systems.
  - 1. Submit calculations and drawings for Earth Retention Systems prepared, signed and stamped by a Professional Engineer registered in the state where the work is performed.
- B. Performance data for the compaction equipment to be utilized

- C. Construction methods that will be utilized for the removal of rock
- D. Modified Proctor Test (ASTM D1557) results and soil classification (ASTM D2487) for all proposed backfill materials at the frequency specified below:
  - 1. For suitable soil materials removed during Excavation, perform one test for every 1,000 cubic yards of similar soil type. Similarity of soil types will be as determined by the Engineer.
  - 2. For borrow materials; perform tests at frequency specified in Section 02320, Borrow Materials.
- E. Compaction test results (i.e. ASTM D6938 or ASTM D1556) at a frequency of one test for every 100 cubic yards of material backfilled or at a minimum of one test per lift. The Engineer will determine the locations and lifts to be tested. The Contractor shall plan his operations to allow adequate time for laboratory tests and to permit taking of field density tests during compaction.
  - 1. Methods and equipment proposed for compaction shall be subject to prior review by the Engineer. Compaction generally shall be done with vibrating equipment. Static rolling without vibration may be required by the Engineer on sensitive soils that become unstable under vibration. Displacement of, or damage to existing utilities or structure shall be avoided. Any utility or structure damaged thereby shall be replaced or repaired as directed by the Engineer.
  - 2. Additional compaction testing may be required when there is evidence of a change in the quality of moisture control or the effectiveness of compaction.
    - a. Any costs associated with correcting and retesting as a result of a failure to meet compaction requirements shall be borne by the Contractor.
  - 3. If all compaction test results within the initial 25% of the total anticipated number of tests indicate compacted field densities equal to or greater than the project requirements, the Engineer may reduce frequency of compaction testing. In no case will the frequency be reduced to less than one test for every 500 cubic yards of material backfilled.
  - 4. The Contractor is cautioned that compaction testing by nuclear methods may not be effective where trenches are so narrow that trench walls impact the attenuation of the gamma radiation, when adjacent to concrete that impacts the accuracy of determining moisture content, or where oversize particles (i.e. large cobbles or coarse gravels) are present. In these cases, other field density testing methods may be required.
- F. Dewatering plan for the excavation locations.

## 1.5 QUALITY ASSURANCE

- A. All Excavation, Trenching, and related Earth Retention Systems shall comply with the requirements of OSHA excavation safety standards (29 CFR Part 1926 Subpart P), 520 CMR 14.00, and other State and local requirements. Where conflict between OSHA and State regulations exists, the more stringent requirements shall apply.



## 1.6 PROJECT CONDITIONS

- A. Notify Dig Safe and obtain Dig Safe identification numbers.
- B. Notify utility owners in reasonable advance of the work and request the utility owner to stake out on the ground surface the underground facilities and structures. Notify the Engineer in writing of any refusal or failure to stake out such underground utilities after reasonable notice.
- C. Make explorations and Excavations to determine the location of existing underground utilities and other underground facilities in accordance with Paragraph 3.2.D of this Section.

## PART 2 PRODUCTS

### 2.1 SOIL MATERIALS

- A. Fill material is subject to the approval of the Engineer and may be either material removed from excavations or borrow from off site. Fill material, whether from the excavations or from borrow, shall be of such nature that after it has been placed and properly compacted, it will make a dense, stable fill.
- B. Satisfactory fill materials shall include materials classified by ASTM D 2487 as GW, GP, GM, GP-GM, GW-GM, GC, GP-GC, SW, and SP. Additional requirements are included in Section 02320.
- C. Satisfactory fill materials shall not contain trash, refuse, vegetation, masses of roots, individual roots more than 18 inches long or more than 1/2 inch in diameter, or stones over 6 inches in diameter. Unless otherwise stated in the Contract Documents, organic matter shall not exceed minor quantities and shall be well distributed.
- D. Satisfactory fill materials shall not contain frozen materials nor shall backfill be placed on frozen material.
- E. Excavated surface and/or pavement materials such as gravel or trap rock that are salvaged may be used as a sub-grade material, if processed to the required gradation and compacted to the required degree of compaction. In no case shall salvaged materials be substituted for the required gravel base.

### 2.2 CONTROLLED DENSITY FILL

- A. Controlled density fill shall be flowable, excavatable and shall require no vibration for placement. Compressive strength at 28 days shall be 30 to 80 psi and the slump shall be 10 to 12 inches.

### 2.3 DEWATERING MATERIALS

- A. Provide haybales and silt fence in accordance with Section 01570.
- B. Provide silt filter bags (Dandy Dewatering Bag, Dirtbag, JMP Environ-Protection Filter Bag, or equal) of adequate size to match flow rate.

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. Public Safety and Convenience

1. Adhere to the requirements of 520 CMR 14.00 for all excavation work.
2. Take precautions for preventing injuries to persons or damage to property in or about the Work.
3. Provide safe access for the Owner and Engineer at site during construction.
4. Do not obstruct site drainage, natural watercourses or other provisions made for drainage.

### 3.2 CONSTRUCTION

#### A. Earth Retention Systems

1. Provide Earth Retention Systems necessary for safety of personnel and protection of the Work, adjacent work, utilities and structures.
2. Maintain Earth Retention Systems for the duration of the Work.
3. Sheeting
  - a. Systems shall be constructed using interlocking corner pieces at the four corners. Running sheet piles by at the corners, in lieu of fabricated corner pieces, will not be allowed.
  - b. Drive sheeting ahead of and below the advancing excavation to avoid loss of materials from below and from in front of the sheeting.
  - c. Sheeting is to be driven to at least the depth specified by the designer of the earth retention system, but no less than 2 feet below the bottom of the Excavation.
4. Remove earth retention system, unless designated to be left in place, in a manner that will not endanger the construction or other structures. Backfill and properly compact all voids left or caused by the withdrawal of sheeting.
  - a. Remove earth retention systems, which have been designated by the Engineer to be left in place, to a depth of 3 feet below the established grade.

#### B. Excavation

1. Perform excavation to the lines and grades indicated on the Drawings. Backfill unauthorized over-excavation in accordance with the provisions of this Section.
2. Excavate with equipment selected to minimize damage to existing utilities or other facilities. Hand excavate as necessary to locate utilities or avoid damage.
3. Sawcut the existing pavement in the vicinity of the excavation prior to the start of excavation in paved areas, so as to prevent damage to the paving outside the requirements of construction.
4. Perform excavation in such a manner as to prevent disturbance of the final subgrade. The Engineer or Owner may require the final six inches

of excavation be performed by hand, with the use of a smooth-faced bucket, or other means acceptable to the Engineer or Owner, at no additional cost if subgrade disturbance is considered excessive as judged by the Engineer or Owner.

5. During excavation, material satisfactory for backfill shall be stockpiled in an orderly manner at a distance from the sides of the excavation equal to at least one half the depth of the excavation, but in no case closer than 2 feet.
  - a. Excavated material not required or not suitable for backfill shall be removed from the site.
  - b. Perform grading to prevent surface water from flowing into the excavation.
  - c. Pile excavated material in a manner that will endanger neither the safety of personnel in the excavation nor the Work itself. Avoid obstructing sidewalks and driveways.
  - d. Hydrants under pressure, valve pit covers, valve boxes, manholes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the Work is completed.
6. Grade or create berms or swales to direct surface water from excavations to appropriate structures designed to accommodate storm water. If no structures exist, direct water to areas that minimize impacts to adjacent structures and properties.
7. Make pipe trenches as narrow as practicable and keep the sides of the trenches undisturbed until backfilling has been completed. Provide a clear distance of 12 inches on each side of the pipe.
8. Perform the excavation in such a manner as to prevent disturbance of the final subgrade. If excessive subgrade disturbance is occurring, as judged by the Owner or Engineer, then the final 6 inches of the excavation shall be performed by hand, with the use of a smooth-faced bucket, or other means acceptable to the Engineer or Owner.
  - a. Grade the excavation bottom to provide uniform bearing and support for the bottom quadrant of each section of pipe.
  - b. Excavate bell holes at each joint to prevent point bearing.
  - c. Remove stones greater than 6 inches in any dimension from the bottom of the trench to prevent point bearing.
9. If satisfactory materials are not encountered at the design subgrade level, excavate unsatisfactory materials to the depth directed by the Engineer and properly dispose of the material. Backfill the resulting extra depth of excavation with satisfactory fill materials and compact in accordance with the provisions of this Section.

### C. Backfill and Compaction

1. Unless otherwise specified or indicated on the Drawings, use satisfactory material removed during excavation for backfilling trenches. The Engineer may require stockpiling, drying, blending and reuse of materials from sources on the Project.
2. Spread and compact the material promptly after it has been deposited. When, in the Engineer's judgment, equipment is inadequate to spread and compact the material properly, reduce the rate of placing of the fill or employ additional equipment.
3. Prior to backfilling or placement of structures, excavated subgrades shall be proof compacted with either 10 passes of a 10-ton vibratory drum roller for open excavations or 6 passes of a large, reversible, walk behind vibratory compactor capable of exerting a minimum force of 2,000 pounds in trench or pit excavations. Soft or weak spots shall be over-excavated and replaced with compacted Granular Fill or compacted Crushed Stone wrapped in a non-woven geotextile, as directed by the Owner or their representative. If proof compaction will prove detrimental to the subgrade due to the presence of groundwater, static rolling may be allowed at the discretion of the Engineer or Owner.
4. Soil bearing surfaces shall be protected against freezing and the elements. If construction is performed during freezing weather, structures shall be backfilled as soon as possible after they are constructed. Insulating blankets or other means shall be used for protection against freezing at the discretion of the Engineer or Owner.
5. When excavated material is specified for backfill and there is an insufficient amount of this material at a particular location on the Project due to rejection of a portion thereof, consideration will be given to the use of excess material from one portion of the Project to make up the deficiency existing on other portions of the Project.
  - a. Use borrow material if there is no excess of excavated material available at other portions of the Project.
6. Backfilling and compaction methods shall attain 95% of maximum dry density at optimum moisture content as determined in accordance with ASTM D1557.
7. Do not place stone or rock fragment larger than six inches in greatest dimension in the backfill.
8. Maximum loose lift height for backfilling existing or borrow material shall be 12 inches, unless satisfactory compaction is demonstrated otherwise to the Engineer through field-testing. In no case shall loose lift height for backfilling exceed 3 feet.
9. Do not drop large masses of backfill material into the trench endangering the pipe or adjacent utilities.
10. Install pipe in rock excavated trenches on a dense graded stone bedding with a minimum depth of 6 inches. Shape the stone bedding at the pipe bells to provide uniform support. Encase the pipe in the dense graded

crushed stone bedding to a grade 6 inches over the top of the pipe and 12 inches on each side of the pipe.

11. Backfill from the bottom of the trench to the centerline of the pipe with the specified material. This initial backfill is to be placed in layers of no more than 6 inches and thoroughly tamped under and around the pipe. This initial backfilling shall be deposited in the trench for its full width on both sides of the pipe, fittings and appurtenances simultaneously.
12. Where excavation is made through permanent pavements, curbs, paved driveways, or paved sidewalks, or where such structures are undercut by the excavation, place the entire backfill to sub-grade with granular materials and compact in 6 inch layers. Use approved mechanical tampers for the full depth of the trench. If required, sprinkle the backfill material with water before tamping so as to improve compaction. Any trenches improperly backfilled, or where settlement occurs, shall be reopened to the depth required to correct the problem, and shall then be refilled and properly compacted with the surface restored to required grade at no additional expense.
13. The Contractor shall not place backfill against or on structures until they have attained sufficient strengths to support the loads to which they will be subjected, without distortion, cracking, or other damage. As soon as possible after the structures are adequate, they shall be backfilled with suitable backfill material.
14. Place and compact backfill around manholes, catch basins, gate boxes or other structures in six inch layers, from a point one foot over the pipe. Exercise care to protect and prevent damage to the structures.

#### D. Test Pit Excavation

1. General requirements of test pits are specified in Section 02210.

#### E. Dewatering

1. Provide, operate and maintain adequate pumping, diversion and drainage facilities in accordance with the approved dewatering plan to maintain the excavated area sufficiently dry from groundwater and/or surface runoff so as not to adversely affect construction procedures nor cause excessive disturbance of underlying natural ground. Locate dewatering system components so that they do not interfere with construction under this or other contracts.
2. Conduct operations so as to prevent at all times the accumulation of water, ice and snow in excavations or in the vicinity of excavated areas so as to prevent water from interfering with the progress or quality of the work.
3. Take actions necessary to ensure that dewatering discharges comply with permits applicable to the Project. Dispose of water from the trenches and excavations in such a manner as to avoid public nuisance, injury to public health or the environment, damage to public or private property, or damage to the work completed or in progress.

4. Repair any damage resulting from the failure of the dewatering operations and any damage resulting from the failure to maintain all the areas of work in a suitable dry condition.
5. Exercise care to ensure that water does not collect in the bell or collar holes to sufficient depth to wet the bell or collar of pipes waiting to be jointed.
6. Take precautions to protect new work from flooding during storms or from other causes. Control the grading in the areas surrounding all excavations so that the surface of the ground will be properly sloped to prevent water from running into the excavated area. Where required, provide temporary ditches for drainage. Upon completion of the work, all areas shall be restored to original condition.
7. Brace or otherwise protect pipelines and structures not stable against uplift during construction.
8. Do not excavate until the dewatering system is operational and the excavation may proceed without disturbance to the final subgrade.
9. Unless otherwise specified, continue dewatering uninterrupted until the structures, pipes, and appurtenances to be installed have been completed such that they will not float or be otherwise damaged by an increase in groundwater elevation.
10. Temporarily lower the groundwater level at least two feet below excavations to limit potential "boils," loss of fines, or softening of the ground. If any of these conditions are observed, submit a modified dewatering plan to the Engineer within 48 hours. Implement the approved modified plan and repair any damage incurred.
11. When subgrades are soft, weak, or unstable due to improper dewatering techniques, remove and replace the materials in accordance with Section 02320 at no cost to the Owner.
12. Notify the Engineer immediately if any settlement or movement is detected of survey points adjacent to excavations being dewatered. If settlement is deemed by the Engineer to be related to the dewatering, submit a modified dewatering plan to the Engineer within 24 hours. Implement the approved modified plan and repair any damage incurred to the adjacent structure at no cost to the Owner.
13. Dewatering discharge:
  - a. Install sand and gravel, or crushed stone, filters in conjunction with sumps, well points, and/or deep wells to prevent the migration of fines from the existing soil during the dewatering operation.
  - b. Do not discharge water into any sanitary sewer system.
  - c. Provide separately controllable pumping lines.
  - d. The Engineer reserves the right to sample discharge water at any time.

14. Removal
  - a. Do not remove dewatering system without written approval from the Engineer.
  - b. Backfill and compact sumps or ditches with screened gravel or crushed stone in accordance with Section 02320.
  - c. Remove well points and deep wells. Backfill abandoned well holes with cement grout having a water cement ratio of 1 to 1 by volume.

### 3.3 PROTECTION

#### A. Protection of Existing Structures

1. All existing foundations, conduits, wall, pipes, wires, poles, fences, property line markers and other items which the Engineer decides must be preserved in place without being temporarily or permanently relocated, shall be carefully supported and protected from damage by the Contractor. Should such items be damaged, they shall be restored by the Contractor to at least as good condition as that in which they were found immediately before the Work began.

#### B. Accommodation of Traffic

1. Streets and drives shall not be unnecessarily obstructed. The Contractor shall take such measures at his own expense to keep the street or road open and safe for two-way traffic unless otherwise indicated.
2. Construct and maintain such adequate and proper bridges over excavations as may be necessary or as directed for the safe accommodation of pedestrians and vehicles. Provide substantial barricades at crossings of trenches, or along the trench to protect the traveling public.
3. Where deemed necessary, such additional passageways as may be directed shall be maintained free of such obstructions. All material piles, open excavations, equipment, and pipe which may serve as obstructions to traffic shall be protected by proper lights, signage, or guards as necessary.
4. All traffic controls shall be in accordance with the Manual on Uniform Traffic Control Devices for Streets and Highways, latest edition.

#### C. Erosion and Sedimentation Control

1. Take all necessary steps to prevent soil erosion.
2. Plan the sequence of construction so that only the smallest practical area of land is exposed at any one time during construction.
3. Temporary vegetation and/or mulching shall be used to protect critical areas exposed during construction as judged by the Engineer.

END OF SECTION

SECTION 02317

UNDERGROUND WARNING TAPE

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
  - 1. Underground Warning Tape

1.2 SUBMITTALS

- A. Shop Drawing Submittals
  - 1. Product Data

PART 2 PRODUCTS

2.1 MATERIALS

- A. Metallic warning tape for underground piping shall be polyethylene tape with metallic core for easy detection and location of piping with a metal detector.
- B. Tape shall be 6 inches wide.
- C. Tape shall be as manufactured by Seton Name Plate Corp., New Haven, CT; Presco Detectable Underground Warning tape, Sherman, Texas; Blackburn Manufacturing, Neligh, NE; Mercotape, Hachensach, NJ; or equal.
- D. The warning tape shall be heavy gauge 0.004 inch polyethylene and shall be resistant to acids, alkalis and other soil components. It shall be highly visible in the following colors with the associated phrases stamped in black letters and repeated at a maximum interval of 40 inches.

Type of Utility	Color	Warning Message
Sanitary Sewer	Green	CAUTION – SANITARY SEWER BURIED BELOW
Storm Drain	Green	CAUTION – STORM DRAIN BURIED BELOW
Water	Blue	CAUTION – WATER LINE BURIED BELOW
Gas	Yellow	CAUTION – GAS LINE BURIED BELOW

- E. The tape shall be of the type specifically manufactured for marking and locating utilities.





## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. All buried pipe and fittings shall be installed with metallic-lined underground warning tape located no more than 24 inches below final grade to allow detection by a metal detector.

END OF SECTION

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## SECTION 02320

### BORROW MATERIALS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Gravel Borrow
  - 2. Processed Gravel Borrow for Pavement Sub-base
  - 3. Sand Borrow
  - 4. Stone Borrow
  - 5. Ordinary Borrow
- B. Related Sections
  - 1. Section 02315 – Excavation, Backfill, Compaction and Dewatering

##### 1.2 REFERENCES

- A. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
- B. ASTM C117 - Standard Test Method for Materials Finer than 75  $\mu\text{m}$  (No. 200) Sieve in Mineral Aggregates by Washing
- C. ASTM D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
- D. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lb./ft<sup>3</sup>)
- E. ASTM D2434 - Standard Test Method for Permeability of Granular Soils (Constant Head)
- F. ASTM D2487 - Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- G. ASTM D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- H. AASHTO – Standard Specification for Transportation Materials and Methods of Sampling and Testing, 1986 Edition as amended
- I. Commonwealth of Massachusetts Highway Department “Standard Specification for Highways and Bridges,” 1988 Edition as amended

##### 1.3 SUBMITTALS

- A. Representative Samples of borrow materials taken from the source. Tag, label, and package the Samples as requested by Engineer. Provide access to the borrow site for field evaluation and inspection.

- B. Provide sieve analysis (ASTM C136) and permeability analysis (ASTM D2434) from certified soils testing laboratory for all borrow materials. Take and test a sample, at no additional cost to the Owner for each 1,500 c.y. of borrow material placed.
- C. Provide modified proctor analysis (ASTM D1557) from certified soils testing laboratory for all borrow materials.
  - 1. Take and test a sample of low permeability soil for each 5,000 cy of material placed, or as directed by the Engineer.
  - 2. All other borrow materials shall be tested once unless more frequent testing is deemed necessary by the Engineer or Owner due to material variation.
- D. The Engineer reserves the right to require more frequent testing than that which is specified above should the borrow characteristics change.

#### 1.4 QUALITY ASSURANCE

- A. No borrow shall be placed prior to the approval of Samples by the Engineer.

#### 1.5 PROJECT/SITE CONDITIONS

- A. Existing Conditions

- 1. Comply with any environmental requirements and restrictions.
- 2. Keep all public and private roadway surfaces clean during hauling operations and promptly and thoroughly remove any borrow or other debris that may be brought upon the surface before it becomes compacted by traffic. Frequently clean and keep clean the wheels of all vehicles used for hauling to avoid bringing any dirt upon the paved surfaces.

### PART 2 PRODUCTS

#### 2.1 GRAVEL BORROW

- A. Gravel Borrow shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings, and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.

Gradation requirements for Gravel Borrow shall be determined by AASHTO-T11 and T27 and shall conform to the following:

Sieve	Percent Passing
½ inch	50 – 85
No. 4	40 – 75
No. 50	8 – 28
No. 200	0 - 10

Maximum size of stone in Gravel Borrow shall be 2 inches.

## 2.2 PROCESSED GRAVEL BORROW FOR PAVEMENT SUBBASE

- A. The compacted Processed Gravel Borrow to be used for gravel access roads and pavement subbase, or other area where a firm, free-draining subgrade is needed shall consist of inert material that is hard, durable stone and coarse sand, free from loam and clay, surface coatings and deleterious materials. The coarse aggregate shall have a percentage of wear, by the Los Angeles Abrasion Test, of not more than 50.
- B. Gradation requirements shall conform to the following:

Sieve	Percent Passing
3"	100
1 ½"	70 – 100
¾"	50 – 85
No. 4	30 – 60
No. 200	0 - 10

- C. Stockpile the processed materials in such a manner to minimize segregation of particle sizes. All processed gravel shall come from approved stockpiles.

## 2.3 SAND BORROW

- A. Sand Borrow material shall be supplied from an off-site borrow area approved by the Engineer. Testing of the off-site Sand Borrow shall be at the Contractor's expense.
- B. Sand Borrow shall consist of clean, inert, hard, durable grains of quartz or other hard, durable, rock, free from loam or clay, surface coatings and deleterious materials. The allowable amount of material passing a No. 200 sieve as determined by ASTM-C117 shall not exceed 10% by weight.
- C. Material shall consist of a clean, non-plastic, granular material conforming to the requirements of a SW, SP or SM under the Unified Soil Classification System (USCS) (ASTM D2487).
- D. The material shall have the characteristics that when placed and compacted, the soil particles will bind together so as to form a solid, stable surface capable of supporting rubber-tired vehicular traffic during wet weather periods as well as extended dry weather periods. The borrow material shall not contain fines to the extent that the surface layer becomes "greasy" when wet.
- E. The material shall not contain stones larger than 3/8 inch in diameter.
- F. Material consisting of frozen clogs, ice and snow will be rejected.
- G. All sand borrow material to be used shall be subject to approval by Engineer, and Engineer reserves the right to reject any borrow material from the job that does not meet the above requirements.

## 2.4 STONE BORROW

### A. Crushed Stone Borrow

1. Crushed stone borrow shall consist of one of the following materials:
  - a. Durable crushed rock consisting of the angular fragments obtained by breaking and crushing solid or shattered natural rock, and free from a detrimental quantity of thin, flat, elongated or other objectionable pieces. A detrimental quantity will be considered as any amount in excess of 15% of the total weight. Thin stones shall be considered to be such stones whose average width exceeds 4 times their average thickness. Elongated stones shall be considered to be stones whose average length exceeds 4 times their average width.
  - b. Durable crushed gravel stone obtained by artificial crushing of gravel boulders or fieldstone with a minimum diameter before crushing of 8 inches.
2. The crushed stone shall be free from clay, loam or deleterious material and not more than 1.0% of satisfactory material passing a No. 200 sieve will be allowed to adhere to the crushed stone.
3. The crushed stone shall have a maximum percentage of wear as determined by the Los Angeles Abrasion Test (AASHTO-T-96) as follows:
  - a. For Class 1 Bit. Conc. 30%\*\*
  - b. For Cement Concrete Aggregate 45%\*\*\*
  - c. Crushed Stone for Subbase 45%

\*\*Crushed stone for this use shall consist of crushed or shattered natural rock only. Crushed gravel stone will not be permitted.

\*\*\*Except for 5000 psi or greater cement concrete and prestressed concrete which shall be 30%.
4. The crushed stone shall conform to the grading requirements shown in the following grading Table.

Sieve Size	Percent by Weight Passing Through	
	Minimum	Maximum
<b>1 ½" Crushed Stone</b>		
2"	100	--
1 ½"	95	100
1"	35	70
¾"	0	25
<b>¾" Crushed Stone</b>		
1"	100	--

3/4"	90	100
1/2"	10	50
3/8"	0	20
No. 4	0	5

5. Stone gradations shall vary depending on field use and shall be determined by Engineer.

**B. Dense Graded Stone Borrow**

1. The crushed stone used for backfill shall be a dense graded mixture and conform to the following gradation requirements.

Sieve Size (Square Openings)	Percent by Weight Passing Through	
	Minimum	Maximum
5/8"	100	100
1/2"	85	100
3/8"	15	45
#4	0	15
#8	0	5

**C. Stone Riprap**

1. Stone Riprap shall consist of hard, durable, and sound angular stone which is resistant to weathering. Rounded stones, boulders, elongated, thin or flat pieces whose breadth or thickness is less than one-third its length will not be allowed. The parent rock for riprap stones shall be igneous or metamorphic rock. Sedimentary rock types such as shale, sandstone, or similar soft stone will not be allowed. The stone shall be free of ice, snow, overburden, spoil, silt, clay, loam, organics and other deleterious matter.
2. Riprap stone shall have a minimum dry unit weight of 165 pounds per cubic foot.
3. Gradations of riprap stone material shall be based upon the thickness of the riprap layer as shown on the plans. Riprap layer thickness shall be defined as the typical layer thickness as measured perpendicular to the ground surface or slope. In all cases, no more than 5 percent by weight shall pass a 2-inch sieve. Diameter refers to the equivalent-volume spherical stone diameter as defined by the U.S. Army Corps of Engineers in EM 1110-2-1601.

a. Riprap Type 1

Percent of Stones Smaller	Diameter (in.)	Percentage of Stones Weighing Less Than	Weight (lbs.)
D <sub>100</sub>	36	100	2,330
D <sub>50</sub>	24	50	690
D <sub>15</sub>	18	15	345

b. Riprap Type 2

Percent of Stones Smaller	Diameter (in.)	Percentage of Stones Weighing Less Than	Weight (lbs.)
D <sub>100</sub>	24	100	690
D <sub>50</sub>	16	50	200
D <sub>15</sub>	12	15	100

4. Riprap material shall be well graded as a material without gaps in the gradation curve. The uniformity ratio ( $D_{85}/D_{15}$ ) shall be between 1.5 to 3.0.
5. All riprap stone placed at the site shall be of the same parent rock from the same quarry and shall be visually similar.

D. Dumped Riprap Borrow

1. Stone used for dumped riprap shall be hard, durable, subangular in shape, resistant to weathering and shall meet the gradation requirement specified. Neither breadth nor thickness of a single stone should be less than one-third its length. Rounded stone or boulders will not be accepted unless authorized by the Engineer. Stone shall be free from overburden, spoil, shale, or organic material and shall meet the gradation requirement as specified.

Size of Stone	Maximum Percent of Total Weight Smaller Than Given Size
400 lb.	100
300 lb.	80
200 lb.	50
*25 lb.	10

\*No more than 5% by weight shall pass a 2" sieve.

2. Each load of riprap shall be reasonably well graded from the smallest to the maximum size specified. Stones smaller than the specified 10% size and spall will not be permitted in an amount exceeding 10% by weight of each load.

E. Modified Rockfill

1. Stone used for modified rockfill shall meet the requirements of Article M2.02.4 "Modified Rockfill" as detailed in the "Massachusetts Specifications for Highways and Bridges", 1988 edition and any revisions thereto. Modified rockfill shall consist of hard, durable, angular shaped stones which are the product of the primary crushing of a stone crusher. Rounded stone, boulders, sandstone and similar soft stone or relatively thin slabs will not be acceptable. Stone shall be free from overburden, spoil, shale, and organic material and shall conform to the following gradation requirements:

Stone Size	Percent Passing Through	
	Minimum	Maximum
8"	95	100
4"	0	25
2½"	0	5

2.5 ORDINARY BORROW

- A. Ordinary borrow shall have the physical characteristics of soils designated as type GW, GP, GM, SW, SP or SM, under USCS and shall not be specified as gravel borrow, sand borrow, special borrow material or other particular kind of borrow. It shall have properties such that it may be readily spread and compacted for the formation of embankments. The borrow shall not include rocks with a major dimension greater than 8 inches.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Prior to the placement of borrow material, site preparation shall be completed as required by the Contract Documents, and approved by the Engineer.
- B. Ensure that all materials are properly stockpiled on site to prevent contamination by other materials.
- C. Place borrow material over the entire area in uniform lifts and compact in accordance with Section 02315.
- D. Utilize on-site soils prior to using off-site borrow provided on-site soils meet the requirements of the specifications.
- E. Utilize gravel borrow in all locations where a surface treatment has not been specified but requires a firm finish surface.
- F. Processed gravel for pavement subbase is intended to provide a stable foundation for driveways, sidewalk and roadway repair where a gravel base has been specified.



- G. Borrow shall be used as a replacement for unsuitable materials where poor soil conditions are encountered during the progress of the work, where approved by the Engineer. Borrow type will be determined by the Engineer. Borrow material used as a replacement for unsuitable soil is not intended to be an aid to dewatering.
- H. Shape borrow used for pipe foundation material so that it supports the pipe properly and will not damage the pipe, bells, collars, or the pipe fittings.
- I. Place all borrow to keep it free of other materials and to prevent segregation.

END OF SECTION

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## SECTION 02501

### DISINFECTION OF WATER DISTRIBUTION SYSTEMS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Procedures for disinfecting new and repaired water distribution systems
- B. Related Sections
  - 1. Section 02502 – Testing of Water Distribution Systems
  - 2. Section 02514 – Ductile Iron Pipe and Fittings
  - 3. Section 02518 – Valves and Hydrants

##### 1.2 REFERENCES

- A. American Water Works Association, AWWA C651, *AWWA Standard for Disinfecting Water Mains*.
- B. American Public Health Association, American Water Works Association and Water Pollution Control Federation, *Standard Methods For the Examination of Water and Wastewater*.

##### 1.3 SUBMITTALS

- A. A formal statement in writing to the Engineer that all crews responsible for installation and repairs within the operating distribution system have been properly trained and are aware of prescribed construction practices and disinfection procedures to avoid contamination to the operating distribution system.
- B. The name of competent person(s) responsible for the disinfection processes and performing the required bacteriological sampling. The Engineer will approve the disinfection process to be used in advance of any disinfection efforts.
- C. Certificate of compliance that the independent commercial laboratory performing the bacteriological sampling analyses is certified with the State Department of Environmental Protection and U.S. Environmental Protection Agency for analyzing public drinking water supplies.
- D. Certified results for all bacteriological sampling prior to restoring or placing the distribution system into service.
- E. For each section of pipe to be chlorinated, the Contractor shall inform the Engineer in writing of the locations for taps to be installed and utilized for the procedure.

## 1.4 QUALITY ASSURANCE

### A. Qualifications & Certifications

1. The Contractor shall employ trained personnel aware of the need to carefully observe prescribed construction practices and disinfection procedures in order to prevent contamination to the distribution system.
2. The competent person(s) responsible for the disinfection processes and bacteriological sampling shall be familiar with AWWA C651- Standards for Disinfecting Water Mains and experienced with the Continuous Feed Method of disinfection. The Engineer shall approve disinfection procedures in advance.
3. Bacteriological sampling shall be made in full accordance with AWWA C651 and under the supervision of the Engineer.
4. An independent commercial laboratory certified for analyzing public drinking water supplies by the State Department of Environmental Protection and U.S. Environmental Protection Agency shall analyze all bacteriological samples and provide certified results to the Engineer and/or Owner for review prior to restoring or placing the system into service.

## 1.5 PROJECT/SITE CONDITIONS

- A. The general procedure for disinfection and analyses is described in Part 3, Execution, of this section. If project conditions warrant the need for special disinfection procedures, obtain prior written approval from the Engineer.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. The forms of chlorine used in the disinfection operations shall conform to ANSI/AWWA B300. Materials Safety Data Sheets (MSDS) for the disinfectant shall be readily available for reference. The competent person responsible for the disinfection operation shall be fully trained and equipped to handle any emergency that may arise.

## PART 3 EXECUTION

### 3.1 DISINFECTION

- A. Before being placed into service, all new water pipelines shall be chlorinated using the Continuous Feed Method specified in AWWA C651 – Section 4.4.3. The Engineer shall approve the procedure in advance.
1. The Contractor will determine the location of the chlorination and sampling points in the field. The Contractor shall install taps for chlorinating, sampling and expulsion of air and shall uncover, backfill and plug the taps as required.

2. Prior to disinfecting the water main, the main shall be completely filled to remove all air pockets and then flushed to remove particulate. The flushing velocity in the main shall not be less than 2.5 ft/s unless the Engineer and/or Owner determine that the conditions do not permit the required flow to be discharged to waste.

**TABLE 3.1-1**

Required Flow to Flush Pipelines (40 psi residual pressure in water main)\*

Pipe Diameter (in)	Flow Required to Produce 2.5 ft/s (Approximate) Velocity in Main	Number of 2 ½ inch Hydrant Outlets
4	100 gpm	1
6	200 gpm	1
8	400 gpm	1
10	600 gpm	1
12	900 gpm	2
16	1600 gpm	2

\*AWWA C651, AWWA Standard for Disinfecting Water Mains

3. At a point not more than 10 feet downstream from the beginning of the new main, water entering the new main shall receive a dose of chlorine fed at a constant rate such that the water will not have less than 25 mg/L (PPM) free chlorine throughout the entire section of pipe to be chlorinated.

**TABLE 3.1-2**

Chlorine Required to Produce 25-mg/L Concentration in 100 Feet of Pipe – By Diameter\*

Pipe Diameter (in)	100 % Chlorine (Pounds)	1% Chlorine Solution (Gals.)
4	0.013	0.16
6	0.030	0.36
8	0.054	0.65
10	0.085	1.02
12	0.120	1.44
16	0.217	2.60

\*AWWA C651, AWWA Standard for Disinfecting Water Mains

4. The chlorinated water is to remain in the new pipeline for at least 24-hours. After a contact time of 24-hours there should be a free chlorine concentration of not less than 10 mg/L (PPM). During this period, proper precautions are to be taken to prevent this chlorinated water from flowing back into the existing system.
  5. All valves and hydrants within the treated section shall be operated to ensure disinfection of the appurtenances.
- B. The Tablet Method consisting of placing calcium hypochlorite granules or tablets in the water main as it is being installed and then filling the main with potable water and allowing it to set for a contact period is not acceptable.
- C. The interior of all pipe, fittings and valves used in making a repair or tie-in shall be swabbed or sprayed with a one percent (1%) hypochlorite solution before they are installed.

### 3.2 FINAL FLUSHING

- A. Following the chlorination period, all treated water shall be flushed from the lines at their extremities and replaced with water from the distribution system.
1. Flushing the main is to be accomplished at as high a velocity as possible consistent with the ability of the Contractor to collect the discharge water for proper disposal.
  2. All treated water flushed from the lines shall be disposed of by discharging to the nearest sanitary sewer or by other approved means provided in AWWA C651.
  3. Flushing shall be done in strict conformance with all applicable local, state and federal regulations. No discharge of chlorinated water to any storm sewer or natural watercourse will be allowed.

### 3.3 BACTERIOLOGICAL ANALYSES

- A. After the 24-hour disinfection period and all chlorine solution has been thoroughly flushed, the bacteriological sampling and analysis of the replacement water may then be performed.
1. Bacteriological sampling shall be made by the Contractor's competent person(s) in full accordance with AWWA C651- Section 5, *Bacteriological Tests* and under the supervision of the Engineer.
  2. Analysis shall be performed by an independent commercial laboratory certified by the State Department of Environmental Protection and U.S. Environmental Protection Agency for analyzing public drinking water supplies. All results shall be provided to the Engineer for review.
  3. Two consecutive sets of acceptable samples, taken at least 24-Hours apart are required prior to placing the main into service. Failure of any one of the bacteriological test samples shall require rechlorination and retesting by the Contractor.



4. The line shall not be placed in service until the bacteriological requirements of AWWA C651 are met.

END OF SECTION

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## SECTION 02502

### TESTING OF WATER DISTRIBUTION SYSTEMS

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Section Includes

1. Testing of pipe, fittings, valves and accessories

##### 1.2 REFERENCES

- A. American Water Works Association, AWWA C600, AWWA Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances

##### 1.3 SUBMITTALS

- A. List of equipment and personnel to be used for the pressure test.

#### PART 2 PRODUCTS – NOT USED

#### PART 3 EXECUTION

##### 3.1 TEST PARAMETERS

- A. For water mains, the pressure test shall not be conducted until the new main has been flushed clean, disinfected in accordance with Section 02501 and the chlorinated water properly disposed of. After acceptable completion of the water system disinfection, the Contractor may commence pressure testing of the new water main.
- B. Run pressure test and leakage test simultaneously in accordance with ANSI/AWWA C600.
- C. Test pressure shall not be less than 1.25 times the working pressure at the highest point along the test section. Test pressure shall not exceed pipe or thrust-restraint design pressures.
- D. The hydrostatic test shall be of at least 2-hour duration or until such time as the Engineer indicates acceptance of the pipeline.
- E. Test pressure shall not vary by more than  $\pm 5$  psi (35 MPa or 0.35 bar) for the duration of the test.
- F. Do not operate valves in either direction at differential pressure exceeding the rated valve working pressure. Use of a test pressure greater than the rated valve pressure can result in trapped test pressure between the gates of a double-disc gate valve. For tests at these pressures, the test setup should include a provision, independent of the valve, to reduce the line pressure to the rated valve pressure on completion of the test. The valve can then be opened enough to equalize the trapped pressure with the line pressure, or fully opened if desired.



- G. Test pressure shall not exceed the rated pressure of the valves when the pressure boundary of the test section includes closed, resilient-seated gate valves or butterfly valves.

### 3.2 TIME FOR MAKING TESTS

- A. No pipeline is to be placed under pressure or subjected to hydrostatic pressure until at least 5 days have elapsed after the concrete thrust blocks have been installed. If high early strength concrete is used in the concrete thrust blocks, the hydrostatic pressure can be applied to the main after 2 days have elapsed from time of construction of the thrust blocks.
- B. The Contractor will be allowed to complete backfilling as hereinbefore specified, prior to undertaking the leakage and pressure tests. Backfilling prior to conducting tests will be at the option of the Contractor with the exception of intersections, driveways, crosswalks and other such locations where holding open the trench may adversely affect the public.
- C. Pipelines may be subjected to hydrostatic pressure and inspected for leakage at any convenient time after the trench has been partially backfilled. Partial backfilling shall consist of filling along the center of the pipe length and leaving the joint open for inspection.

### 3.3 OPERATION OF EXISTING WATER SYSTEM

- A. Do not operate any valve or other control device on the existing water system for any purpose. Do not make any tap or cut-in to the existing water system without the approval of the Engineer and unless an authorized representative of the Owner is present.
- B. When the Contractor's operations require the adjustment of any hydrant, valves, or other control device on the existing system, the Owner will provide authorized personnel for the purpose of supervising the operation of these control devices. Provide the personnel for the operation of these devices.

### 3.4 PREPARATION

- A. Conduct connections to the existing system under the Engineer's direction.
- B. To allow for proper filling, venting, testing, etc., install any corporation stops and/or special fittings which may be required. All such installation will be subject to the Engineer's approval.
- C. Foreign materials left in pipelines during installation often results in valve or hydrant seat leakage during pressure tests. Thorough flushing is recommended prior to a pressure test by partially opening and closing valves and hydrants several times under expected line pressure, with flow velocities adequate to flush foreign material out of the main, valves and hydrants. Flushing requirements are specified in Specification 02501, Part 3.1.A.2.

### 3.5 PROCEDURE

- A. On completion of the pipeline or any valved section thereof, fill pipeline with water and test. Draw water from the existing water system under the direction of the Engineer and the Water Department.

- B. Before applying the specified test pressure, expel air completely from the pipe, valves, and hydrants. If permanent air vents are not located at all high points, install corporation cocks at such points so that the air can be expelled as the line is filled with water. After all the air has been expelled, close the corporation cocks and apply the test pressure. At the conclusion of the pressure test, either remove and plug or leave in place the corporation cocks at the discretion of the Owner.
- C. Slowly fill each valved section of pipe with water, and apply the specified test pressure as described in Part 3.1 by means of a pump connected to the pipe in a manner satisfactory to the Engineer. Valves shall not be operated in either the opening or closing direction at differential pressures above the rated pressure. The system shall be stabilized at the test pressure before conducting the leakage test.

### 3.6 EXAMINATION UNDER PRESSURE

- A. Examine exposed pipes, fittings, valves, hydrants, and joints carefully during the test.
- B. Repair or replace any cracked or defective pipe, fittings, valves, hydrants, or joints that are discovered following the pressure tests with sound material, and repeat the test until it is satisfactory to the Engineer.

### 3.7 LEAKAGE TEST

- A. Leakage is defined as the quantity of water that must be supplied into the newly laid pipe, or any valved section thereof to maintain pressure after the pipe has been filled with water and the air has been expelled. Testing shall include all hydrants and hydrant branches. Leakage shall not be measured by a drop in pressure in a test section over a period of time.
- B. No pipe installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{SD\sqrt{P}}{148,000}$$

- Where:
- L = allowable leakage, in gallons per hour
  - S = length of pipe tested, in feet
  - D = nominal diameter of the pipe, in inches
  - P = average test pressure during the leakage test, in pounds per square inch (gauge)

This formula is based on an allowable leakage of 10.5 gpd/mi/in of nominal diameter at a pressure of 150 psi.

- C. When testing against closed metal-seated valves, an additional leakage per closed valve of 0.0078 gph/in. of nominal valve size will be allowed.
- D. When hydrants are in the test section, the test shall be made against the closed main valve in the hydrant.



- E. Acceptance of Installation - acceptance will be determined on the basis of allowable leakage. If any test of laid pipe discloses leakage greater than that specified in this section, locate and make approved repairs as necessary until the leakage is within the specified allowance at no additional cost to the Owner.
- F. Visible leaks are to be repaired, regardless of the amount of leakage.

END OF SECTION

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## SECTION 02503

### TESTING OF SANITARY SEWER AND STORM DRAINAGE SYSTEMS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Testing of Storm Drainage Systems
  - 2. Testing of Gravity Sewer Systems

#### PART 2 PRODUCTS – NOT USED

#### PART 3 EXECUTION

##### 3.1 TESTING OF STORM DRAINAGE SYSTEMS

- A. Inspect storm drainage pipes included in the Work to ensure that pipes are straight between structures, correctly sloped, clean of debris and sediment, and generally free flowing. Alignment shall meet the requirements of Paragraph 3.2.E of this Section.
- B. Visually inspect all storm drainage structures included in the Work to ensure that all structures are clean of debris and sediment, and have frames, covers, grates, inverts, sumps, and other required appurtenances.
- C. All flexible pipe types including polyvinyl chloride (PVC), high-density polyethylene (HDPE), or polypropylene (PP) shall be tested for deflection in accordance with Paragraph 3.2.D of this Section at least forty five (45) days after it has been backfilled.

##### 3.2 TESTING OF GRAVITY SEWER SYSTEMS

- A. Test all gravity sewers for allowable leakage by low pressure air test or by an infiltration/exfiltration water test as described herein.
  - 1. Low Pressure Air Test
    - a. After completing backfill of a section of pipe, conduct a line acceptance test using low-pressure air. Perform the test under the supervision of the Engineer.
    - b. Seal-test pneumatic plugs before use in the actual test installation. Lay one length of pipe on the ground and seal at both ends with the pneumatic plugs to be checked. Introduce air into the plugs to 25 psig. Pressurize the sealed pipe to 5 psig. Satisfactory pneumatic plugs will hold against this pressure without bracing and without movement of the plugs out of the pipe.

- c. After a manhole reach of pipe has been backfilled and cleaned, and the pneumatic plugs have been checked, place a plug in each end of the line (at each manhole), and inflate the plugs to 25 psig. Introduce low pressure air into this sealed line until the internal air pressure reaches 4 psig greater than the average back pressure of any groundwater that may be over the pipe. Allow a minimum of two minutes for the air pressure to stabilize. After the stabilization period (3.5 psig minimum pressure in the pipe), disconnect the air hose from the control panel to the air supply. The portion of the line being tested has passed the test if the time required in minutes for the pressure to decrease from 3.5 to 2.5 psig (greater than the average back pressure of any groundwater that may be over the pipe) is not less than the time shown for the given diameters and lengths in Table 1 at the end of this Section.
- d. Air tests shall cover a 1.0 psig pressure drop; 0.5 psig pressure drop tests are not acceptable.
- e. In areas where groundwater is known to exist, install a one-half inch diameter capped pipe nipple, approximately 10 inches long, through the manhole wall on top of one of the sewer lines entering the manhole. The nipple shall be installed at the time the sewer line is installed. Immediately prior to the line acceptance test, determine the elevation of the groundwater by removing the pipe cap, blowing air through the pipe nipple to remove any obstructions, and then connecting clear plastic tube to the nipple. Hold the hose vertically and measure the height after the water has stopped rising in this plastic tube. Divide the height in feet by 2.3 to establish the pressure in pounds per square inch (psig) that will be added to all readings. (For example, if the height of water is 11.5 feet, then the added pressure will be 5 psig. This increases the 3.5 psig to 8.5 psig, and the 2.5 psig to 7.5 psig. The allowable drop of one pound per square inch and the timing remain the same.)
- f. The maximum starting test pressure should not exceed 9 psig, regardless of groundwater level above the pipe. If the groundwater level is such that the added pressure would be greater than 5.5 psig (12.7 feet), the pipe section may be tested using a starting pressure of 9 psig.
- g. Each pipe nipple installed to measure groundwater levels should be recapped subsequent to the air testing procedure to prevent future infiltration.
- h. As an alternative to installing a pipe nipple in a manhole to measure the height of groundwater, excavate a test pit over the pipe to determine the height of groundwater.

## 2. Infiltration/Exfiltration Test

- a. Where new sewers are installed in areas having a high groundwater level, conduct an infiltration test for a minimum of four hours under the supervision of the Engineer. Isolate various sections of the sewer using watertight plugs, and measure the quantity of water entering the pipe during a predetermined time. If the conditions are such that groundwater table varies depending on surrounding influence and time of the year, or if the table elevation is unknown at the time of testing, excavate test holes as directed by the Engineer.
- b. Where lines are installed in relatively dry areas, conduct an exfiltration test. Isolate various sections of the line using watertight plugs, and fill the line with water to a predetermined level. Determine the loss of water in a predetermined time by measuring the quantity of water required to refill the line to the original level.
- c. The Engineer will determine the length of new sewer to be tested at one time, depending on the grade of the sewer.
- d. Include losses through manholes in determining the loss in a sewer line. For an exfiltration test, fill manholes to the bottom of the cone or flat top section and allow the level to stabilize before beginning the test. Refilling to the reference line may be required before commencing the test.
- e. The maximum acceptable loss, through either infiltration or exfiltration, shall not exceed 100 gallons per mile per 24 hours per inch of diameter of the pipe tested. When two or more pipeline sections are tested at the same time, the allowable leakage for the shortest section shall be used as the acceptable loss for the entire length being tested.

### B. Vacuum Test for Manholes - Gravity Sewer Lines

1. After a manhole has been constructed, conduct a manhole acceptance test using the following vacuum test procedure:
  - a. Plug all lift holes with an approved non-shrink grout.
  - b. Plug all pipes entering the manhole, taking care to securely brace the plug from being drawn into the manhole.
  - c. Place the test head at the inside of the top of the precast concrete cone section and inflate the seal in accordance with the manufacturers' recommendations.

- d. Draw a vacuum of 10 inches of mercury and shut off the vacuum pump. With the valves closed, measure the time for the vacuum to drop to 9 inches. The manhole shall pass if the time is greater than:
    - 1 min. 0 sec. for 0-ft. to 10-ft. deep manholes
    - 1 min. 15 sec. for 10-ft. to 15-ft. deep manholes
    - 1 min. 30 sec. for 15-ft. to 25-ft. deep manholes
  - e. If the manhole fails the initial test, make repairs with a non-shrink grout. Re-test until a satisfactory test is obtained.
- C. Allowable Deflection Test for flexible pipe types including polyvinyl chloride (PVC), high-density polyethylene (HDPE), or polypropylene (PP)
- 1. Pipe deflection measured not less than 45 days after the backfill has been completed shall not exceed 5 percent. Deflection shall be computed by multiplying the amount of deflection (average outside diameter less twice the average wall thickness diameter when measured) by 100 and dividing by the nominal diameter of the pipe.
  - 2. Deflection shall be measured with a rigid mandrel (Go-No-Go) device cylindrical in shape and constructed with a minimum of nine or ten evenly spaced arms or prongs. Submit drawings of the mandrel with complete dimensions for each diameter of pipe to be tested. Hand-pull the mandrel through all sewer and drain lines.
  - 3. Uncover any section of pipe not passing the mandrel and replace the bedding and backfill to prevent excessive deflection. Replace sections of the pipe as necessary. Retest repaired pipe immediately upon backfilling of trench until acceptable.
  - 4. Retest the repaired section of pipeline again, from manhole to manhole, after the 45-day backfill period, until acceptable.
- D. Test Failures
- 1. In case leakage or deflection exceeds the above specified amount, locate the failure and repair it in accordance with applicable Sections of this Contract.
  - 2. Pipelines with shear-type breaks, “fishmouths” or damaged gaskets, cracked bells or couplings, hairline fractures, or structural damage shall be replaced. Mechanical sleeve couplings, poured concrete collars or similar repairs are not permitted. The use of pressure grouting repair techniques will not be allowed without the written consent of the Engineer.
  - 3. After repairs have been made, re-test the line and repeat the process of repairing and re-testing until satisfactory test results, as specified in this Section, are obtained.

E. Alignment of Gravity Sewers and Drains

1. Lay gravity sewers and drains accurately to line and grade.
2. After the pipe is laid and backfill complete, TV inspect the interior of the pipe from manhole to manhole. If excessive deviation in either the horizontal or vertical alignment is observed by the Engineer, the alignment is considered unacceptable.
3. If the alignment is unacceptable due to horizontal displacement, the Contractor will be allowed to construct intermediate manholes at his own expense. If the alignment is unacceptable due to vertical displacement, remove and replace the pipe to the proper grade.



**TABLE I**

Specification Time Required for a 1.0 PSIG Pressure Drop  
For Size and Length of Pipe Indicated for Q=0.0015

1 Pipe Diameter (in.)	2 Minimum Time (min:sec)	3 Length for Minimum Time (ft)	4 Time for Longer Length (sec)	Specification Time for Length (L) Shown (min:sec)								
				100 ft.	150 ft.	200 ft.	250 ft.	300 ft.	350 ft.	400 ft.	450 ft.	
4	3:46	597	.380 L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	.854 L	5:40	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24	
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48	
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38	
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04	
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41	
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31	
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33	
27	25:30	88	17.306 L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48	
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15	
33	31:10	72	25.852 L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53	
36	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46	

Uni Bell PVC Pipe  
Association Publication  
Uni-B-6-90

END OF SECTION

## SECTION 02514

### DUCTILE IRON PIPE AND FITTINGS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Ductile iron pipe and fittings, direct buried
  - 2. Restrained joints and fittings
  - 3. Cast-in-place concrete anchor blocks and thrust blocks
- B. Related Sections
  - 1. Section 02315 – Excavation, Backfill, Compaction and Dewatering
  - 2. Section 02317 – Underground Warning Tape
  - 3. Section 02501 – Disinfection of Water Distribution Systems
  - 4. Section 02502 – Testing of Water Distribution Systems

##### 1.2 REFERENCES

- A. Pipe and fittings shall conform to the latest edition of the following standards unless otherwise specified:
  - 1. ANSI/AWWA C104/A21.4, Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water.
  - 2. ANSI/AWWA C110/A21.10, Ductile Iron and Grey Iron Fittings 3" through 48" for Water and Other Liquids.
  - 3. ANSI/AWWA C111/A21.11, Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings.
  - 4. ANSI/AWWA C150/A21.50, Thickness Design of Ductile Iron Pipe.
  - 5. ANSI/AWWA C151/A21.51, Ductile Iron Pipe, Centrifugally Cast, for Water.
  - 6. ANSI/AWWA-C153/A21.53, Ductile Iron Compact Fittings Water Service.
  - 7. ANSI/AWWA C600, Installation of Ductile Iron Water Mains and their Appurtenances.
  - 8. ANSI/AWWA C800, Underground Service Line Valves and Fittings.
  - 9. ANSI/AWWA C651, Disinfecting Water Mains.
  - 10. ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
  - 11. ASTM A536, Standard Specification for Ductile Iron Castings

12. ASTM B88, Standard Specification for Seamless Copper Water Tube.
13. Ductile Iron Pipe Research Association, "Thrust Restraint Design for Ductile Iron Pipe" (Current Edition).

### 1.3 SUBMITTALS

#### A. Administrative Submittals

1. Detailed description of proposed pipe handling and installation methods along with the manufacturer's approval of those methods.
2. Construction details and schedule of Work for each connection to existing piping at least 7 days prior to beginning the Work. Approval must be received before commencement of Work on-site.

#### B. Shop Drawings

1. Manufacturer's drawings and catalog cuts, including descriptive literature indicating product characteristics and conformance with specifications and code requirements. Submit shop drawings for ductile iron pipe; fittings; couplings; filling rings; linings and coatings; and all accessories.
2. Location for each type of restrained joint or device to prevent joint separation along with installation, assembly and disassembly instructions.

#### C. Quality Control Submittals

1. Certificates of compliance on pipe materials.
2. Prior to first shipment of pipe, submit certified test reports that the pipe for this Contract was manufactured and tested in accordance with the ASTM and ANSI/AWWA Standards specified herein.
3. Manufacturer of pipe and Manufacturer of fittings on the project shall have an established, annually audited and certified, quality control procedure for manufacturing of pipe and manufacturing of fittings respectively. Manufacturer shall be certified by an independent, third party auditor for compliance with all requirements of the AWWA standards. The manufacturer shall submit a current certificate of compliance for the plant facility where the pipe or fittings are to be made. Certificate of compliance shall be submitted for each additional year of manufacturing during the duration of the Project. The manufacturer shall not change the plant manufacturing the pipe or fittings during the duration of the Work.

### 1.4 QUALITY ASSURANCE

- A. Pipe and fittings shall be inspected at the foundry as required by the standard specifications to which the material is manufactured. In addition, the Owner reserves the right to have any or all pipe, fittings, and special castings inspected and/or tested by an independent service, or by the Engineer, at either the manufacturer's plant or other testing laboratory at their own expense.

- B. Ductile iron pipe shall be from a single manufacturer. Fittings shall be from a single manufacturer, not necessarily the pipe manufacturer.
- C. The Engineer will inspect the pipe and fittings after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the Specification requirements. Pipe rejected after delivery, or at any point during the progress of the Work, shall be marked for identification and shall immediately be removed from the job site and replaced at no additional cost to the Owner.
- D. Test pipe under pressure for defects and leakage in accordance with Section 02502.

## 1.5 PROJECT CONDITIONS

- A. Secure permits and pay fees required to carry out the piping work. Comply with laws, ordinances, codes, rules, and regulations of the local and state authorities having jurisdiction over the Work. Where provisions of the Contract Documents are in conflict with the codes, the more stringent shall govern.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. American Cast Iron Pipe Company
- B. U.S. Pipe
- C. or equal

### 2.2 PIPE AND FITTINGS - GENERAL

- A. Ductile iron pipe shall be designed in accordance with AWWA C150 and shall be manufactured in accordance with AWWA C151. Fittings and other materials referenced in this section shall conform to the latest edition of the references listed in Paragraph 1.2 of this section.
- B. Unless otherwise indicated or specified in the Contract Documents, buried ductile iron pipe and fittings shall be Class 52 with push on joints.
- C. Unless otherwise indicated or specified, buried pipe shall have an asphaltic exterior coating in accordance with AWWA C110, C151 or C153, as applicable.
- D. Unless otherwise indicated or specified in the Contract Documents, buried fittings shall be ductile iron or gray iron with mechanical joints.
- E. Pipe and fittings shall be cement mortar lined and seal coated on the interior in accordance with AWWA C104. Cement mortar lining shall be twice the standard thickness; tolerance shall be minus 0 inches, plus 1/8 inch.

### 2.3 PIPE AND FITTING JOINTS

- A. Push-on-joints and mechanical joints shall conform to ANSI/AWWA C111/A21.11.

- B. Where indicated on the Drawings, provide restrained joints. Gaskets shall meet the material requirements of ANSI/AWWA A21.11/C111 for mechanical joint gaskets.
- C. Restrained joint pipe shall be Flex-Ring®/Lok-Ring® Joint by American Cast Iron Pipe Company, TR FLEX® by US Pipe and Foundry Co., or equal.

## 2.4 FITTINGS

- A. Fittings shall be ductile iron or gray iron.
- B. Fittings less than or equal to 12 inches in size shall conform to ANSI/AWWA C110/A21.10 or ANSI/AWWA C153/A21.53 and shall have a 350 psi pressure rating.
- C. Mechanical joint retainer glands shall be installed on all mechanical joints. Retainer glands shall be specifically designed to fit standard mechanical joint bells with corrosion resistant, high strength, low-alloy T-head bolts conforming to ANSI/AWWA A21.11/C-111 and ANSI/AWWA A21.53/C-153. Retainer glands shall be manufactured of ductile iron conforming to ASTM A536-80, grade 60-42-10. Wedges shall be of hardened ductile iron and require the same torque in all sizes. These devices shall have a minimum 250 psi pressure rating with a minimum safety factor of 2:1 and shall be EBAA IRON, Inc., Megalug® series 1100 or equal. Glands shall be listed with Underwriters Laboratories and/or approved by Factory Mutual.
- D. Anchoring tees shall have main run ends as indicated on the Drawings or as required for the installation. The branch shall have a plain end with an integral gland and rotating mechanical joint gland to provide a restrained connection with the adjacent valve or fitting (typically used for hydrant branches).

## 2.5 COUPLINGS

- A. Solid sleeves shall have long body type (12 inches min.) and mechanical joints with retainer glands.
- B. Couplings and transitional couplings for pipe less than or equal to 12 inches in diameter shall consist of a long body cast iron sleeve and shall have gaskets suitable for the pipe being joined. The bolts and nuts shall be corrosion resistant high strength, low alloy steel such as Cor-Ten steel or an approved equal. Couplings shall be Romac style 501, Dresser style 153, Rockwell type 441, or equal. Transition couplings for pipe less than or equal to 12 inches in diameter shall be Dresser Style 162, Rockwell Type 441, Smith Blair Omni Style 442, or equal.
- C. Couplings and transitional couplings for pipe greater than 12 inches in diameter shall consist of a steel sleeve with gaskets suitable for the pipe being joined. The bolts and nuts shall be corrosion resistant high strength, low alloy steel such as Cor-Ten steel or an approved equal. Couplings shall be Dresser Style 38, Smith Blair Style 311, Romac Style 400, or equal. Transition couplings for pipe greater than 12 inches in diameter shall be Dresser Style 62, Smith Blair Style 413, Romac Style TC400, or equal.
- D. Provide couplings with an exterior epoxy coating.

## 2.6 GASKETS, GLANDS, NUTS, AND BOLTS

- A. Gaskets, glands, nuts, bolts and accessories shall conform to ANSI/AWWA C111/A21.11 or C153/A21.53, as appropriate.
- B. Gaskets shall be of plain tipped rubber, suitable for exposure to the liquid within the pipe.
- C. Lubricants must be suitable for the type of fluid to be carried by the pipeline, and shall be NSF approved for water service.
- D. Glands shall be ductile or cast iron.
- E. Bolts shall be high strength, low alloy.

## 2.7 THRUST BLOCKS AND ANCHOR BLOCKS

- A. Concrete shall have a 28-day compressive strength of 3,000 psi.

## 2.8 TEST CONNECTIONS

- A. Install air release, test connections, and blow offs in the piping for pressure testing and disinfection at locations to be determined by the Contractor and approved by the Engineer.
  - 1. Corporation cocks shall be in accordance with ANSI/AWWA C800 and shall be  $\frac{3}{4}$  inch diameter with CC thread on inlet by iron pipe thread flare on outlet as manufactured by Mueller, Ford, McDonald or equal.
  - 2. Copper tubing shall be annealed Type K soft tubing and shall conform to the requirements of ASTM B88.
  - 3. Upon completion of testing and disinfection, remove the corporation cock and replace with a brass plug and the copper tubing removed. Field swab the brass plug for disinfection in accordance with AWWA C651.

## PART 3 EXECUTION

### 3.1 GENERAL

- A. Deliver, handle, store and install ductile iron pipe in accordance with ANSI/AWWA C600.

### 3.2 DELIVERY, STORAGE AND HANDLING

- A. Delivery of Pipe and Fittings
  - 1. Coordinate delivery of pipe and fittings with installation and unload along the line of work outside the trench near as practicable to the point of final placement, and properly wedged secure. Give minimum 24 hour notice to the Engineer prior to pipe deliveries. Notice shall include the method of unloading.
  - 2. Unload and handle pipe and fittings with a crane or backhoe of proper capacity outfitted with a steel cable sling, belt sling or other specially designed attachment to protect the pipe coating.

3. At the end of each work week, no more than the amount of pipe to be installed the following work week shall remain along the construction route. All pipes remaining along the construction route are to be properly wedged to prevent movement and not interfere with traffic or pedestrian movement. All excess pipes are to be stockpiled at an approved staging yard in accordance with AWWA C600.

B. Storage of Materials

1. Store pipe in a manner to keep pipe interior free from dirt and foreign matter. Store pipe on wood blocking, rails or other suitable materials. Pipe shall not be stored on stones.
2. Pipe may be stored on top of each other to the maximum stacking height specified by AWWA C600.
3. Protect materials subject to corrosion in accordance with manufacturer's recommendations.
4. If pipe or project materials are stored at the Contractor's approved staging yard, the Engineer shall be permitted reasonable access to the staging yard for inspection of the pipe and materials.
5. Pipe ends shall be sealed tight using polyethylene bags and tape immediately after unloading, regardless of the storage time length, in order to keep foreign matter and wind blown debris out.
6. All fittings are to be stored off of the ground on wooden pallets.

C. Handling Materials

1. Handle materials in such a manner so as to prevent damage to the concrete or mortar coating or lining.
2. Materials are to be handled using methods approved by the pipe manufacturer.
3. Materials damaged during handling will be rejected and shall be replaced at the Contractor's expense.
4. Ensure that no foreign materials enter the pipe and fittings during handling.

### 3.3 COORDINATION

- A. Existing mains may have to be shut down to complete the connections, as shown on the Drawings and as specified herein.
  1. Existing valves will only be operated by the Owner.
  2. Submit requests for shutdown of existing piping to the Engineer at least 5 working days prior to the operations, and reschedule operations to prevent conflicts with the Owner's operations.
  3. The Owner reserves the right to cancel the shut-down at any time without penalty if system conditions exist in which it would be a matter of public health or safety to do so.

4. The Owner does not guarantee complete shut down of valves. Make necessary provisions to do work under existing conditions.

### 3.4 DEFECTIVE PIPE

- A. Defective pipe or fittings will be rejected for use on this project. Defective pipe is classified as follows:
  1. Damage to interior lining
  2. Insufficient lining thickness
  3. Pipe out of round
  4. Damaged pipe barrel area
  5. Damaged pipe bells or spigots
  6. Missing, misplaced or illegible marking and identification
  7. Outside pipe diameter exceeding allowable tolerance
- B. If defective pipe is discovered after it has been installed, it shall be removed and replaced with sound pipe, at no additional cost to the Owner.

### 3.5 JOB CONDITIONS

- A. Environmental Requirements
  1. Do not lay pipe when weather conditions are unsuitable, as determined by the Engineer, for pipe laying work.
  2. Equipment for pipe laying shall be maintained in good operating order.
  3. Job site shall be kept clean of debris and organized.
- B. Protection
  1. At all times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug. This provision shall apply at all times when pipe laying operations are suspended.
- C. Work Affecting Existing Pipelines
  1. Work on Existing Pipelines:
    - a. Prior to any work on existing pipelines, remove soils, rust and other debris from the exterior wall of the pipe a minimum of 12 inches beyond the work area.
    - b. Cut pipes as shown or required with machines specifically designed for this work.
    - c. Install temporary plugs to keep out all mud, dirt, water and debris.
    - d. Provide necessary adapters, fittings, pipe and appurtenances required.
    - e. Cut or tap existing mains at the mid span of a pipe barrel. In no case shall a pipe be cut or tapped within 24 inches of a pipe joint.



### 3.6 CLEANING PIPE AND FITTINGS

- A. Clean and remove foreign matter from the interior of each pipe and fitting before placing in the trench. Remove pipe and fittings whose interior has been contaminated with oil, gasoline or kerosene and replace at no additional cost to the Owner. Remove pipe and fittings whose interior has been contaminated with any material which is a regulated drinking water contaminate or which damages the cement and replace at no additional cost to the Owner. Should foreign material or contaminants be observed in previously installed pipe, cease work until foreign material or contaminated pipe is decontaminated or removed.
- B. Remove all lumps, blisters, and excess asphaltic coating from the bell and spigot ends of each pipe or fitting. The outside of the spigot and the inside of the bell shall be wire-brushed and wiped clean and be dry and free from oil and grease before the pipe or fitting is laid.
- C. On all ductile iron pipe or fittings, the bell of the pipe and the spigot of the adjacent pipe or fitting shall be wire-brushed and cleaned of rust and dirt. The bell of the pipe or fitting and the spigot of the adjacent pipe shall then be lubricated with the joint lubricant furnished with the pipe, and used in accordance with the manufacturer's directions.

### 3.7 ALIGNMENT AND GRADE

- A. Lay and maintain the pipe at the required lines and grades as shown on the Drawings. Fittings shall be at the locations indicated on the Drawings with joints centered, and spigots properly fitted. No deviation shall be made from the line and grade indicated on the Drawings, except with the approval of the Engineer.
- B. Joint Openings and Deflection:
  - 1. The maximum allowable joint openings and deflection for push-on joint pipe and restrained joint pipe shall be one-half the manufacturer's maximum allowable opening and deflection.
  - 2. Radius curves indicated on the Drawings or approved during Shop Drawing review shall be made using full lengths of pipe. The use of short lengths of pipe and extra joints in order to make a smaller radius turn will not be allowed without the written approval of the Engineer.
- C. Line or Grade Conflicts with Other Structures
  - 1. Wherever obstructions not shown on the Drawings are encountered during the progress of the Work and interfere to such an extent that an alteration in the pipe layout is required, the Engineer will order a deviation from the line and grade at locations where obstructions such as culverts, ducts, wire and/or pipes are encountered. The pipe shall be laid over or under such obstacles with a minimum clearance of 6 inches. The Engineer reserves the right to make the decision to go over or under obstructions during construction.
- D. Where underground conditions indicate a change of alignment or grade, such change shall be made only with the written consent of the Engineer.

- E. Except at locations indicated on the Drawings by the profile, do not establish high points where air can accumulate.

### 3.8 PIPE INSTALLATION

#### A. General Requirements

1. Prepare the pipe trench in accordance with Section 02315.
2. Keep trenches dewatered while installing pipe until all required pipe joints have been made and the trench has been backfilled above the water table to a point where pipe uplift will not occur when the pipe is empty.
3. Carefully lower pipe and fittings into the trench piece by piece by means of a crane, ropes or other tools or equipment, in such a manner as to prevent damage to pipeline materials and protective coatings and linings. Under no circumstances shall pipeline materials be dropped or dumped into the trench.
4. Carefully inspect pipe and fittings for cleanliness and defects prior to placing them in the trench.
5. Install underground warning tape over the pipe in accordance with Section 02317.

#### B. Laying Pipe

1. Install pipe with a minimum of 5 feet of cover, unless indicated otherwise on the Drawings or directed by the Engineer.
2. Prevent foreign material from entering the pipe while it is being placed in the line. During laying operations, no debris, tools, clothing or other materials shall be placed in the pipe.
3. When laying pipe, the spigot end shall be centered in the bell, the pipe forced home and the joint completely assembled. The pipe shall be adjusted to correct line and grade and secured in place with approved backfill material, properly tamped under and around the pipeline.

#### C. Cutting Pipe

1. Furnish pipe in full lengths. Cut ductile iron pipe without damage to the pipe or cement lining. The cutting shall be done to leave a smooth end at right angles to the axis of the pipe.
2. Cut ductile iron pipe either by the use of compression-type chain cutters which exert an even continuous force on the wall of the pipe or by power driven abrasive wheels.
3. On ductile iron pipe using rubber joints, the outside edge of the cut end must be tapered back approximately  $\frac{1}{4}$  inch at an angle of about 30 degrees so as to provide for the proper assembly of this joint.

### 3.9 PUSH-ON JOINTS

- A. Push-on joints shall be made in accordance with the manufacturer's instructions. Install gaskets in the pipe bell after lowering the pipe into the trench for installation. Thoroughly clean the bell and spigot of dirt and tar blisters in the trench utilizing a wire brush or bristle brush. Insert rubber gasket in the groove of the bell end of the pipe beginning at the bottom of the bell and working to the top of the bell. Apply lubricant per the manufacturer's recommendations utilizing a paint brush to the pipe gasket and the pipe spigot to be joined. Place a clean rag under the joint to protect the joint from dirt caused by unintentional grounding of the pipe during jointing. Upon completion, remove the rag. Align the plain end of the pipe to be laid and insert in the bell of the pipe to which it is to be joined and push home with a jack or by other means. After joining the pipe use a metal feeler to make certain that the rubber gasket is correctly located.

### 3.10 MECHANICAL JOINTS

- A. Mechanical joints shall be made in accordance with Appendix A of ANSI A21.11/AWWA C111 and the manufacturer's instructions. Thoroughly clean and lubricate the joint surfaces and rubber gasket before assembly. Tighten bolts to the specified torques. Under no conditions shall extension wrenches or an extended handle ratchet wrench be used to secure greater leverage.

### 3.11 RESTRAINED JOINTS

- A. Install restrained joint pipe where indicated on the Drawings. Make the joint assemblies in accordance with the manufacturer's recommendations.

### 3.12 CONCRETE THRUST BLOCKS

- A. Place cast-in-place concrete thrust blocks at all bends (regardless of the angle of deflection or direction), caps, offsets, hydrants, and tees, as well as in locations shown on the Drawings or directed by the Engineer. Cast-in-place thrust blocks shall be formed with wood forms; rough earth forms are not acceptable. Protect pipeline materials and fittings from direct adherence of the concrete thrust block by wrapping in plastic, roofing felt, reinforced manila paper or similar material. The thrust block shall not bear directly on the joint and shall not interfere with future adjustments, tightening, or removal of the joint. Thrust blocks shall bear against undisturbed soil at the side or end of the trench and this undisturbed surface shall be carefully cleaned off so as to be vertical. The thrust blocks shall have a minimum horizontal thickness of 2 feet and shall have the minimum bearing area listed on the Drawings, measured perpendicular to the direction of thrust.
- B. Cast-in-place concrete thrust blocks are required at all fittings and will be used in conjunction with retainer glands. Provide thrust blocks and anchor blocks at the locations shown on the Drawings or as Directed by the Engineer.

### 3.13 DISINFECTION

- A. Disinfect pipe, fittings and valves in accordance with Section 02501, before placing into service.



### 3.14 TESTING

- A. Pipe, fittings and valves installed under this contract shall be tested in accordance with Section 02502, before being placed into service.

END OF SECTION

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## SECTION 02515

### POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. PVC Gravity Pipe and Fittings
- B. Related Sections
  - 1. Section 02315 - Excavation, Backfill, Compaction, and Dewatering
  - 2. Section 02320 - Borrow Material
  - 3. Section 02503 - Testing of Sanitary Sewer and Storm Drainage Systems

##### 1.2 REFERENCES

- A. ASTM D2412 - Standard Test Method for External Loading Properties of Plastic Pipe by Parallel-Plate Loading
- B. ASTM D2444 - Standard Test Method for Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight)
- C. ASTM D3034 - Specification for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings
- D. ASTM D3212 - Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- E. ASTM F477 - Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe

##### 1.3 SUBMITTALS

- A. Submit specifications and shop drawings for materials and equipment furnished under this Section.
- B. Prior to first shipment of pipe, submit certified test reports that the pipe for this Contract was manufactured and tested in accordance with the ASTM Standards specified herein.

##### 1.4 QUALITY ASSURANCE

- A. Each type of PVC pipe and fittings shall be from a single manufacturer. Alternatively, the pipe manufacturer shall provide certification that the fittings are suitable for installation with the pipe.
- B. Inspection of the pipe will also be made by the Owner after delivery. The pipe shall be subject to rejection at any time on account of failure to meet any of the Specification requirements. Pipe rejected after delivery shall be marked for identification and shall immediately be removed from the job site.

## PART 2 PRODUCTS

### 2.1 MATERIALS

#### A. Gravity Pipe

1. Polyvinyl chloride (PVC) pipe shall be of the size indicated on the Drawings or as specified and shall conform to the latest revision of ASTM D3034, Type SDR 35 for diameters less than or equal to 15 inch diameter. Standard laying lengths shall not exceed 14.0 feet.
2. Joints shall be elastomeric gasket joints and shall provide a watertight seal. Gaskets shall be in accordance with ASTM F477. Assembly of joints shall be in accordance with ASTM D3212.
3. The minimum "pipe stiffness" (load divided by change in inside diameter in direction of load application) at 5% deflection shall be at least 46 psi for pipe tested in accordance with ASTM D2412.
4. No shattering or splitting shall be evident when 150 ft.-lbs. and 210 ft.-lbs. is impacted on 4 inch and 6 inch diameter pipe, respectively, in accordance with ASTM Method of Test D2444.
5. Pipe lengths and fittings to be used on the project shall be clearly marked on the outside in bold type with the name of the manufacturer, pipe size, pipe material, pipe class, and ASTM designation.

## PART 3 EXECUTION

### 3.1 HANDLING PIPE AND FITTINGS

- A. Take care in loading, transporting, and unloading to prevent injury to the pipe. Do not drop pipe or fittings. Examine pipe and fittings before installing, and no piece shall be installed that is found to be defective.
- B. If any defective pipe is discovered after it has been installed, remove and replace it with a sound pipe in a satisfactory manner. Thoroughly clean pipe and fittings before installing, keep clean until they are used in the work, and conform to the lines, grades and dimensions required when installed.
- C. Pipe ends requiring cutting shall be cut square without damage to the remaining pipe. Bevel cut pipe ends 1/8 inch at approximately 30 degrees to provide proper assembly of the joint. Beveling can be done with a coarse file or portable grinder.
- D. Support stored pipe from below at not more than 3 foot intervals to prevent deformation. Do not stack pipe higher than 6 feet. Store pipe and fittings in a manner which will keep them at ambient outdoor temperatures. Provide temporary shading as required to meet this requirement. Simply covering of the pipe and fittings which allows temperature buildup when exposed to direct sunlight will not be permitted.

### 3.2 INSTALLATION

- A. No single piece of pipe shall be laid unless it is generally straight. The centerline of the pipe shall not deviate from a straight line drawn between the centers of the openings at the ends of the pipe by more than 1/16 inch per foot of length. If a piece of pipe fails to meet this required check for straightness, it shall be rejected and removed from the site. Laying instructions of the manufacturer shall be explicitly followed.
- B. Install piping and fittings true to alignment and grade. If necessary, each length of pipe shall be cleaned out before installation.
- C. Excavation, trenching and back filling procedures shall be in accordance with Section 02315.
- D. All PVC gravity pipe shall be installed on a bed of 3/4-inch crushed stone borrow meeting the requirements of Section 02320 and have a minimum depth of 6 inches. The 3/4-inch crushed stone borrow shall also completely encase the pipe and cover the pipe to a grade 6 inches over the top of the pipe for the entire width of the trench. Bell holes shall be made in the 3/4-inch crushed stone borrow bedding such that the pipe shall be uniformly supported throughout the entire length of the barrel section.
- E. All pipe shall be tested in accordance with Section 02503.
- F. Deflections in Pipe Alignment
  - 1. Wherever it is necessary to deflect pipe from a straight line, either in the vertical or horizontal plane, to avoid obstructions or where long-radius curves are permitted, the amount of deflection allowed shall not exceed that required for satisfactory making of the joint, and shall be approved by the Engineer.
  - 2. Prior to deflecting the pipeline, the spigot of the pipeline should be marked flush with the bell end to assure that the spigot is not withdrawn excessively as the result of the deflection. After the pipe is deflected, an adequate depth of jointing material must remain on the side where the spigot is away from home and an adequate width of caulking space must remain on the opposite side of the pipe at the face of the bell.
  - 3. The maximum deflection recommended by the manufacturer when using any pipe system must be observed when deflecting a pipeline.
  - 4. In general, all radius curves called for on the Drawings or permitted at the time of construction are to be made using full lengths of pipe. The use of short lengths of pipe and extra joints in order to make a smaller radius turn will not be allowed without the written approval of Engineer.
- G. Unsuitable Laying Conditions
  - 1. No pipe shall be laid in water, in an unsuitable trench or during unsuitable weather conditions.

END OF SECTION





## SECTION 02516

### POLYPROPYLENE PIPE AND FITTINGS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Polypropylene (PP) pipe for:
    - a. Storm drainage and culvert lines
- B. Related Sections
  - 1. Section 02315 – Excavation, Backfill, Compaction and Dewatering
  - 2. Section 02320 – Borrow Material
  - 3. Section 02503 – Testing of Sanitary Sewer and Storm Drainage Systems

##### 1.2 REFERENCES

- A. AASHTO M330 – Polypropylene Pipe 300- 1500-mm (12- to 60-in.) Diameter
- B. ASTM D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
- C. ASTM D2412 – Standard Test Method for Determination of External Loading Characteristics of Plastic Pipe by Parallel-Plate Loading
- D. ASTM D2837 – Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials
- E. ASTM D3212 – Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
- F. ASTM F477 – Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- G. ASTM F1417 – Standard Test Method for Installation Acceptance of Plastic Gravity Sewer Lines Using Low-Pressure Air
- H. ASTM F2487 – Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Corrugated High Density Polyethylene Pipelines
- I. ASTM F2764 – Standard Specification for 6 to 60 in. [150 to 1500 mm] Polypropylene (PP) Corrugated Double and Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications
- J. ASTM F2881 – Standard Specification for 12 to 60 in. [300 to 1500 mm] Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications
- K. ASTM F3058 – Standard Practice for Preliminary Field Testing of Thermoplastic Pipe Joints for Gravity Flow (Non-Pressure) Sewer Lines

### 1.3 SUBMITTALS

- A. Submit product data on the pipe, fittings, and accessories.
- B. Prior to first shipment of pipe, submit certified test reports that the pipe for this Contract was manufactured and tested in accordance with the appropriate ASTM standards specified herein.

### 1.4 DELIVERY, STORAGE AND HANDLING

- A. When lifting with slings, only wide fabric choker slings capable of safely carrying the load shall be used. Wire rope or chain shall not be used to handle pipe.
- B. All pipe and fittings shall be delivered to the site and unloaded with handling that conforms to the manufacturer's instructions for reasonable care. Pipe shall not be rolled or dragged over gravel or rock during handling. The Contractor shall take necessary precautions to ensure the method used in lifting or placing the pipe does not induce undue stress fatigue in the pipe.
- C. In addition to deficiencies not covered by ASTM F2764, ASTM F2881, or AASHTO M330 pipe which has any of the following visual defects, will not be accepted.
  - 1. Pipe with cracks, structural dents, or delamination, when not approved by ENGINEER.
  - 2. Pipe that has been damaged during shipment or from handling even if previously approved before shipment.
  - 3. Acceptance of the pipe at point of delivery shall not relieve CONTRACTOR of full responsibility for any defects in materials due to workmanship.
- D. Pipe shall be handled in a manner intended to prevent damage to the pipe ends or to any coating or lining. Pipe shall not be skidded or rolled against adjacent pipe. Damaged coatings or lining shall be repaired by CONTRACTOR, at CONTRACTOR's expense, in accordance with the recommendations of the manufacturer and in a manner satisfactory to ENGINEER. Physical damage to the pipe or accessory shall be repaired by CONTRACTOR, at CONTRACTOR's expense, and in a manner satisfactory to ENGINEER.
- E. Gasket Storage: All gaskets shall be stored in a cool place, preferably at a temperature less than seventy degrees Fahrenheit (70°F.), and in no case shall the gaskets be stored in the open, or exposed to the direct rays of the sun.

## PART 2 PRODUCTS

### 2.1 MANUFACTURER – GENERAL

- A. The manufacturer shall have manufacturing and quality assurance facilities capable of producing and assuring the quality of the pipe and fittings required by these specifications.

- B. Pipe and fittings from different manufacturers shall not be interchanged for the same type of pipe and application.

## 2.2 PIPE IDENTIFICATION

- A. The following shall be continuously indent printed on the pipe or spaced at intervals not exceeding five-feet:
  - 1. Appropriate ASTM Specifications.
  - 2. Name and/or trademark of the pipe manufacturer.
  - 3. Nominal pipe size, class, and wall.
  - 4. Dimension ratio.
  - 5. A production code from which the date and place of manufacture can be determined.

## 2.3 POLYPROPYLENE PIPE

- A. Approved manufacturers include Advanced Drainage Systems, Inc (ADS)-SaniTite HP pipe.
- B. 12--inch through 60--inch (300 through 1500 mm) pipe shall be smooth interior and annular exterior corrugated polypropylene (PP) pipe meeting the requirements of ASTM F2764, ASTM F2881 or AASHTO M330 Type S (double--wall) or D (triple--wall), for respective diameters.
- C. Material for 12-- through 60--inch pipe and fitting production shall be an impact modified copolymer meeting the material requirements of ASTM F2764, ASTM F2881 and AASHTO M330, for respective pipe diameters.

## 2.4 JOINT PERFORMANCE

- A. Watertight joints shall be bell--and--spigot meeting the watertight requirements of ASTM D3212. Gaskets shall comply with the requirements of ASTM F477. Gaskets shall be installed by the pipe manufacturer and covered with a removable wrap to ensure the gasket is free from debris. A joint lubricant supplied by the manufacturer shall be used on the gasket and bell during assembly.

## 2.5 FITTINGS

- A. Fittings shall conform to ASTM F2764, ASTM F2881 or AASHTO M330, with the exception of meeting the watertight joint performance requirements of ASTM D3212. Gasketed bell & spigot connections shall utilize a spun--on, welded or integral bell and spigot with gaskets meeting ASTM F477.
- B. Repair couplers may be utilized to connect field--cut pipe.

## PART 3 EXECUTION

### 3.1 PREPARATION

- A. The Contractor shall verify that the surface has been prepared to the proper line and grade by shooting invert elevation grades.

### 3.2 INSTALLATION

#### A. Open-Cut Installations

1. Polypropylene pipe and fittings shall be installed in accordance with ASTM Standards, and the manufacturer's recommendations.
2. Pipe is to be lifted or rolled into position, not dragged over the prepared bedding.
3. The pipe is to be set at the slope and grades indicated on the plans. Ensure pipe remains at proper grades.
4. Prepare the area in accordance with Section 02315 – Excavation, Backfill, Compaction and Dewatering.
5. No single piece of pipe shall be laid unless it is generally straight. Laying instructions of the manufacturer shall be explicitly followed.
6. Install piping and fittings true to alignment and grade. If necessary, each length of pipe shall be cleaned out before installation.

#### B. Couplings

1. Couplings shall be installed in accordance with manufacturer's recommendations.

### 3.3 PIPE JOINTING

- A. Joints shall be constructed as described herein and in accordance with manufacturer's installation instructions.
- B. All Bell--and--Spigot pipe joints shall be thoroughly cleaned prior to joining.
- C. Protective gasket wrap must be removed just prior to joint insertion to reduce the risk of introduction of foreign materials.
- D. Joints with gaskets not pre--installed by the manufacturer must be clean and free of foreign materials prior to gasket installation.
- E. Joint lubricant, supplied by the manufacturer, shall be applied to the interior of bell and the leading edge of the gasket on spigot prior to assembly.
- F. Joints shall be assembled by inserting the spigot into the bell to prevent foreign materials from being trapped in the joint connection.
- G. After initial assembly of the joint, CONTRACTOR shall verify line and grade of pipe. Prior to backfill and after final check of line and grade, the CONTRACTOR must verify the joint is fully inserted and properly sealed.

### 3.4 TESTING

- A. All sections of polypropylene drain pipe shall be tested in accordance with Section 02503.

END OF SECTION

## SECTION 02518

### VALVES AND HYDRANTS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Types of valves specified herein include:
    - a. Gate Valves
    - b. Valve Boxes
    - c. Fire Hydrants
    - d. Anchoring Tees
- B. Related Sections
  - 1. Section 01325 – Scheduling of Construction
  - 2. Section 01770 –Closeout Procedures
  - 3. Section 02315 - Excavation, Backfill, Compaction and Dewatering
  - 4. Section 02502 – Testing of Water Distribution Systems
  - 5. Section 02514 - Ductile Iron Pipe and Fittings

##### 1.2 REFERENCES

- A. ASTM A126 – Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
- B. ASTM A307 – Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
- C. ASTM A536 – Standard Specification for Ductile Iron Castings
- D. ASTM A563 – Standard Specification for Carbon and Alloy Steel Nuts
- E. ASTM B584 – Standard Specification for Copper Alloy Sand Castings for General Applications
- F. AWWA C111 - Rubber-Gasket Joints for Ductile Iron Pressure Pipe and Fittings
- G. AWWA C115 – Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges
- H. AWWA C502 –Dry-Barrel Fire Hydrants
- I. AWWA C509 - Resilient-Seated Gate Valves for Water Supply Service
- J. AWWA C550 - Protective Epoxy Interior Coatings for Valves and Hydrants
- K. NSF/ANSI Standard 61 – Drinking Water System Components

### 1.3 SYSTEM DESCRIPTION

- A. Furnish all labor, materials, equipment, and incidentals required to install, complete and ready for operation, all valves, hydrant assemblies, and appurtenances as shown on the Contract Drawings and as specified herein.
- B. Buried valves and hydrants for water distribution systems.

### 1.4 SUBMITTALS

- A. Submit complete Shop Drawings of all valves, valve boxes, hydrants and other material specified in this Section including but not limited to the following:
  - 1. Product data including body material, valve design, pressure and temperature classification, end connection details, seating materials, trim material and arrangement, dimensions and required clearances, and installation instructions.

### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
  - 1. Ensure valves are dry and internally protected against rust and corrosion.
  - 2. Protect valve ends against damage to threads, flange faces, and weld-end preps.
  - 3. Set valves in best position for handling:
    - a. Set gate valves closed to prevent rattling.
- B. Use the following precautions during storage:
  - 1. Do not remove valve end protectors unless necessary for inspection; then reinstall for storage.
  - 2. Protect valves from weather. Store valves indoors. Maintain valve temperature higher than the ambient dew point temperature. If outdoor storage is necessary, support valves off the ground or pavement in watertight enclosures.
- C. Use a sling to handle valves whose size requires handling by crane or lift. Rig valves to avoid damage to exposed valve parts. Do not use handwheels and stems as lifting or rigging points.

## PART 2 PRODUCTS

### 2.1 GENERAL

- A. All valves, hydrants, and appurtenances shall conform to the standards of the Longmeadow Department of Public Works.
- B. Pressure and temperature ratings shall be as specified.
- C. Valve sizes shall be the same size as the upstream pipe, unless otherwise indicated.

- D. Provide accessories including bolts, nuts, glands, and gaskets.
- E. All buried valves shall be supported by a concrete pad across their entire lower bearing surface.
- F. Valves shall have the same end connections as the pipeline in which it is installed.
- G. Buried valves shall have mechanical joint ends compatible with the piping systems in which they are installed in accordance with ANSI/AWWA C111/A21.11-85 and Mega-Lug type retainer glands. Provide mechanical joint accessories, including glands, SBR rubber gaskets, tee head bolts, and nuts with the valves. Provide stainless steel bolts and nuts.
- H. Mechanical joint ends compatible with ductile iron O.D. pipe.
- I. Valves and appurtenances shall be of the size shown on the Contract Drawings.
- J. Equipment of the same type shall be from one manufacturer.
- K. Valves, hydrants, and appurtenances shall have the name of the manufacturer, flow directional arrows, and the working pressure for which they are designed cast in raised letter upon some appropriate part of the body.
- L. Valves for water distribution systems to be certified to NSF 61.
- M. Bolts shall be electro-zinc plated with hex heads and hex nuts in accordance with ASTM A-307 and A-563, respectively.
- N. Provide buried valves with standard valve box with tee-handle operator.

## 2.2 GATE VALVES (RESILIENT SEAT)

- A. Gate valves shall be resilient seat type suitable for underground service complying with the requirements of AWWA C509.
- B. Gate valves shall be designed to be bubble tight for 250 psig water working pressure with no leakage past the seat from either side of the disc, and shall be hydrostatically tested to 500 psig.
- C. Gate valves shall be of the non-rising stem (N.R.S.) design.
- D. Gate valves shall be set vertically (spur gearing).
- E. Gate valves shall open right (clockwise).
- F. Buried gate valves shall be furnished with 2 inch square operating nuts.
- G. Open-left gate valves shall have a black-painted operating nut, and open-right valves shall have a red-painted operating nut.
- H. Cast iron shall meet the specifications of ASTM A126, Class B. Castings shall be clean and sound without defects that will impair their service. No plugging or welding of such defects will be allowed. Ductile iron shall meet the standards of ASTM A536.



- I. The resilient-seated disc wedge shall be of the resilient wedge fully supported type, either cast iron or ductile iron. Solid guide lugs shall travel within channels in the body of the valve. The disc and guide lugs shall be fully encapsulated in SBR (styrene butadiene rubber) or EPDM rubber. Disc wedges that are not 100% fully encapsulated shall not be acceptable. Provide guide caps of an acetal copolymer bearing material to protect the rubber-encapsulated solid guide lugs from abrasion for long life and ease of operation.
- J. The seat shall be SBR or EPDM rubber, matching the disc encasement. The seating surface (rubber) shall be specially designed so as to provide a smooth waterway, without depressions or cavities, which might trap debris and interfere with tight closures.
- K. The body, bonnet, and gate shall be cast/ductile iron, constructed in accordance with AWWA C509. The bonnet to body seal shall incorporate a flat neoprene gasket. Bonnet and body flanges shall be fully machined to assure proper sealing of the gasket.
- L. Gate valve stems shall be of bronze rolled bar stock in accordance with ASTM B584, and shall have a forged thrust collar. The thrust collar shall be factory lubricated, and the thrust collar and its lubrication shall be isolated by the O-Rings from the water way and from outside contamination, providing permanent lubrication for long term ease of operation. An anti-friction thrust washer shall be provided both above and below the thrust collar for ease of operation.
- M. Gate valves shall have O-Ring sealed stems with one O-Ring located below the thrust collar and two O-Rings located above the thrust collar. The two O-Rings located above the thrust collar shall be replaceable with the valve still in service in the fully open position.
- N. Coat internal and external exposed ferrous surfaces of the valve with a fusion-bonded, thermosetting powder epoxy coating suitable for potable water service conforming to AWWA C550. Coating shall be non-toxic and shall impart no taste to water. Coating thickness shall be nominal 5/10 mils. Gate valves for water distribution systems shall be certified to NSF 61.
- O. Gate valves shall be as manufactured by U.S. Pipe Metroseal (Model 250), Mueller (Model 2360), American Flow Control (AFC-2500), Clow (2630 Series), equivalent by M&H Valve Company, or equal.

### 2.3 VALVE BOXES (FOR BURIED VALVES)

- A. Provide a valve box of the adjustable type of heavy pattern, constructed of cast iron and provided with a 6 inch cast iron cover for each buried valve.
- B. Valve boxes shall be manufactured in North America by Clow Corporation, Tyler/Union Corporation, United States Foundries, or equal.
- C. Valve boxes shall be round, 2-piece, sliding type, cast iron. The upper section of each box shall have a flange on top having sufficient bearing area to prevent settling. The bottom of the lower section shall be belled to enclose the operating nut of the valve. The barrel shall be 5-1/2 inch O.D. minimum.

- D. Boxes shall be of lengths consistent with pipe depths. Boxes shall be adjustable, with a lap of at least 6 inches when in the most extended position.
- E. Slot covers for easy removal.
- F. Covers for valve boxes on water mains shall have the word "WATER" cast in the top.
- G. Coat valve boxes with coal-tar pitch enamel or other approved coating.
- H. Valve boxes shall be suitable for the size valve on which they are used. The length of the lower section shall be adequate for trench adjustment, no top or mid-section adapters.
- I. Provide one tee-handled wrench for every four valves installed, unless additional wrenches are required due to variations in valve bury depth. Wrenches shall be field measured to accommodate the depth of bury and provide waist high operation.

## 2.4 FIRE HYDRANTS

- A. Fire Hydrants
  - 1. The hydrant shall meet the requirements of AWWA Standard C-502, latest edition.
  - 2. The hydrant operating nut shall open right.
  - 3. Operating nut
    - a. Shall be D.I. or bronze.
    - b. Shall be pentagon in shape with dimensions of top 1-13/16 inch tapering to 1-7/8 inch on bottom.
  - 4. Nozzles
    - a. 2 each – 2-1/2 inch National Standard Thread
    - b. 1 each – 4-1/2 inch National Standard Thread
  - 5. Provide port covers without chains and with the same size pentagon operator as specified above.
  - 6. Provide traffic model hydrant with breakaway feature.
  - 7. Hydrant shoe or base features
    - a. 6 inch MJ inlet
    - b. 5-1/4 inch valve opening with non-draining bronze seat that is permanently plugged
    - c. Valve seat and sub-seat arrangement shall be bronze to bronze.
  - 8. Bolts
    - a. Buried MJ bolts and nuts (T-head) shall be Cor-Ten or equal.

- b. Buried flange joint bolts shall be 304 stainless steel or silicone bronze.
  9. Protective coatings
    - a. Provide a minimum of 3 mils total dry film thickness for all paintings and coatings.
    - b. The internal components of the hydrant shall be fusion-epoxy coated.
    - c. Coat internal and external cast iron or ductile iron components with an approved bituminous sealer, 3 mils minimum.
  10. Approved hydrants
    - a. Hydrants shall be one of the Longmeadow Department of Public Works standard hydrants, either the American Darling B-84-B or the Mueller Centurion.
- B. The hydrants shall comply with all requirements of AWWA Standard C502-80 and the following requirements:
1. The hydrant shall be a compression type shut-off with valve opening against the pressure. A negligible loss of water shall occur with breakage of the hydrant, whether breakage occurs in the open position or the closed position.
  2. The main valve seat shall be 5¼ inches in diameter.
  3. The inlet connection shall be 6-inch mechanical joint furnished with gasket, gland and bolts.
  4. The color of the hydrant above ground shall be red to match the Town's standard color.
  5. Connecting pipe and pipe nipples between the main line tee and hydrant shall be 6 inch ductile iron, Class 52, conforming to the requirements of Section 02514.
  6. 1½ inch pentagon pattern operating nut.
  7. Stainless steel bolts and nuts
  8. 6 inch hydrant valve and valve box shall conform to paragraphs 2.2 and 2.3.
  9. Anchoring tees shall have main run ends as indicated on the Drawings or as required for the installation. The 6 inch branch shall have a plain end with an integral gland and rotating mechanical joint gland to provide a restrained connection for the valve.
  10. Minimum working pressure shall be 250 psi.
  11. The hydrant tee shall be designed so that the hydrant valve can be securely attached to the main line.

C. Hydrant Paint

1. Thoroughly clean hydrants and paint with two shop or field coats in accordance with AWWA C502 and the instructions of the paint manufacturer.
2. If the hydrants are delivered with the Owner's standard color, paint with one matching field coat of an alkyd gloss enamel. If the hydrants are not delivered with the Owner's standard color, paint with two coats of an alkyd gloss enamel.
3. Alkyd gloss enamel shall be 801 DTM by Sherwin-Williams, 2H-Tneme by Tnemec, or equal. Reflective paint shall be Scotchlite #7211 by 3M.
4. Hydrant color shall be RED.

D. Additional Hydrant Components

1. Supply a minimum of 2 operating wrenches compatible with hydrants.
2. Supply a minimum of 2 safety flange repair kits compatible with hydrants.

E. Anchoring Tees

1. Hydrant tees shall be the "anchoring" type and shall have mechanical joint bells conforming to the requirements of the main pipe. The anchoring tee outlet shall be 6 inch mechanical joint, equipped to anchor the hydrant valve to the tee.
2. Anchoring tees shall have mechanical joint main run ends. The branch shall have a plain end with an integral gland and rotating mechanical joint gland to provide a restrained connection.

F. Tie Rods

1. Tie rods utilized for joint restraints shall be manufactured by Star national Products, Columbus, OH, and shall consist of Star Figure SST7 tie bolts with Figure SST8 nuts, Figure SST17 tie washers, and Figure SST12 all thread tie rods. Tie bolts, tie washers, tie rods, and nuts shall be COR-TEN type steel.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Examine valve interior through the end ports for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks used to prevent disc movement during shipping and handling.
- B. Actuate valve through an open-close and close-open cycle. Examine functionally significant features, such as guides and seats made accessible by such actuation. Following examination, return the valve closure member to the shipping position.
- C. Examine threads on both the valve and the mating pipe for form (i.e., out-or-round or local identification) and cleanliness.

- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Check gasket material for proper size, material composition suitable for service, and freedom from defects and damage.
- E. Prior to valve installation, examine the piping for cleanliness, freedom from foreign materials, and proper alignment.
- F. Replace defective valves with new valves.

### 3.2 HYDRANT INSTALLATION

- A. Excavation, trenching and back filling procedures shall be in accordance with Section 02315.
- B. Provide thrust blocks for all hydrants with bearing against the foot or bottom of the hydrant and against the vertical face of undisturbed soil behind the hydrant. The bearing areas of the thrust block on the soil shall be as shown on the Drawings.
- C. Provide one cubic yard of washed  $\frac{3}{4}$  inch stone around hydrant drains.
- D. Hydrant breakaway flanges shall be located no higher than 3 inches above-grade or lower than at-grade.
- E. Support buried valves 6 inches and larger with a concrete pad.
- F. Install gate valves in the vertical position.
- G. Existing valves and hydrants will be operated only by Londmeadow Public Works personnel.
- H. All newly installed hydrant and branch connections shall be subject to line pressure in an open trench to determine tightness of joints before backfilling, unless they are part of the overall pipeline pressure and leakage testing.
- I. Install fire hydrants in accordance with the Drawings and the manufacturer's recommendation.

### 3.3 VALVE INSTALLATION

- A. Refer to the Drawings for specific valve applications and arrangements.
- B. Install valves in horizontal piping with stem at or above the center of the pipe.
- C. Mechanical Joint Connections
  - 1. Refer to Section 02514 for requirements for installing mechanical joint connections.

### 3.4 INSPECTION AND TESTING

- A. Valves and hydrants shall be inspected and tested in conjunction with the pipelines in which they are installed in accordance with Section 02502.

### 3.5 FINAL ACCEPTANCE AND WARRANTY

- A. Final acceptance of all equipment furnished under these Specifications will be withheld until after the installation and field testing by the Engineer. The manufacturer and the Contractor shall guarantee the equipment against defects of any kind for a period of one year after final testing and acceptance.

END OF SECTION

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## SECTION 02530

### MANHOLES AND CATCH BASINS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Precast concrete manholes
  - 2. Precast concrete catch basins
  - 3. Cast iron manhole frames and covers
  - 4. Cast iron catch basin frames and grates
- B. Related Sections
  - 1. Section 02503 - Testing of Sanitary Sewer and Storm Drainage Systems

##### 1.2 REFERENCES

- A. AASHTO – American Association of State Highway and Transportation Officials, Standard Specifications for Highways and Bridges, most recent edition
- B. ASTM C32 - Standard Specification for Sewer and Manhole Brick (made from clay or shale)
- C. ASTM A48 – Standard Specification for Gray Iron Castings
- D. ASTM C150 – Standard Specification for Portland Cement
- E. ASTM C207 – Standard Specification for Hydrated Lime for Masonry Purposes
- F. ASTM C478 – Standard Specification for Precast Reinforced Concrete Manhole Sections
- G. ASTM C443 – Standard Specification for Joints for Circular Concrete Sewer and Culvert Piping Using Rubber Gaskets
- H. ASTM C923 - Standard Specification for Resilient Connectors between Reinforced Concrete Manhole Structures, Pipes and Laterals
- I. ASTM C990 – Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants

##### 1.3 SUBMITTALS

- A. Submit Shop Drawings, showing all details of construction, including, but not limited to, structure dimensions, reinforcing, joints, and pipe connections to structures.



- B. Submit on all materials and products included in this specification, including, but not limited to, manhole rungs, manhole frames and covers, dampproofing coating, brick masonry, mortar, non-shrink water-proof grout, and catch basin frames and grates.
- C. Submit weights of manhole frames and covers and catch basin frames and grates.
- D. Submit design calculations including verification of adequate anti-flotation features and lateral earth pressures. Calculations shall verify that the manhole structure has been designed to withstand the burial depth, submergence due to flooding, flotation, and dead and live loads.

#### 1.4 QUALITY ASSURANCE

- A. The quality of materials, the process of manufacture, and the finished sections shall be subject to inspection and approval by the Engineer, or other representative of the Owner. Such inspection may be made at the place of manufacture, or at the Site after delivery, or at both places, and the materials shall be subject to rejection at any time on account of failure to meet any of the Specification requirements, even though samples may have been accepted as satisfactory at the place of manufacture. Material rejected after delivery to the job shall be marked for identification and shall be removed from the job at once. Materials which have been damaged after delivery will be rejected, and if already installed, shall be acceptably repaired, if permitted, or removed and replaced, at no additional cost to the Owner.
- B. At the time of inspection, the materials will be carefully examined for compliance with the latest ASTM designation specified and these Specifications, and with the approved manufacturer's drawings. Manhole sections will be inspected for general appearance, dimension, "scratch-strength," blisters, cracks, roughness, and soundness. The surface shall be dense and close-textured.
- C. Imperfections in manhole sections may be repaired, subject to the approval of the Engineer, after demonstration by the manufacturer that strong and permanent repairs result. Repairs will be carefully inspected before final approval. Cement mortar used for repairs shall have a minimum compressive strength of 4,000 psi at 7 days and 5,000 psi at 28 days, when tested in 3 inch by 6 inch cylinders stored in the standard manner. Epoxy mortar may be utilized for repairs subject to the approval of the Engineer.
- D. Personnel shall have confined space entry training as appropriate for the work to be performed.
- E. Manholes and catch basins shall be designed for lateral earth pressures and to resist flotation.

## PART 2 PRODUCTS

### 2.1 PRECAST CONCRETE MANHOLE AND CATCH BASIN SECTIONS

- A. Precast concrete barrel sections and transition top sections, shall conform to ASTM C478 and the following requirements:

1. The wall thickness shall not be less than 5 inches for 48 inch diameter reinforced barrel sections, 6 inches for 60 inch diameter reinforced barrel sections and 7 inches for 72 inch diameter reinforced barrel sections.
2. Top sections shall be eccentric except that flat top sections shall be used where shallow cover requires a top section less than 4 feet as shown on the Drawings.
3. Barrel sections shall have tongue and groove joints.
4. All sections shall be cured by an approved method and shall not be shipped nor subjected to loading until the concrete compressive strength has attained 3,000 psi and not before 5 days after fabrication and/or repair, whichever is longer.
5. Precast concrete barrel sections with precast top slabs and precast concrete transition sections shall be designed for a minimum of AASHTO HS20-44 loading plus the weight of the soil above at 120 pcf.
6. The date of manufacture and the name and trademark of the manufacturer shall be clearly marked on each precast section.
7. Precast concrete bases shall be monolithically constructed. The thickness of the bottom slab of the precast bases shall not be less than the barrel sections or top slab whichever is greater. Precast concrete bases shall be constructed with a 6 inch extended base, unless otherwise shown on the Drawings.
8. Knock out panels for piping shall be provided in precast sections at the locations shown on the Drawings. They shall be integrally cast with the section, 2½ inches thick and shall be sized as shown on the Drawings. There shall be no steel reinforcing in knock out panels.
9. The side wall height of the base section shall be a minimum of 12 inches above the top of the pipe coming into the manholes and catch basins.
10. A 4'-0" deep sump shall be provided below catch basin outlet pipes.

## 2.2 BRICK MASONRY

- A. Bricks shall be good, sound, hard and uniformly burned, regular and uniform in shape and size, of compact texture. Underburned or salmon brick will not be acceptable and only whole brick shall be used unless otherwise permitted. In case bricks are rejected by the Engineer, they shall be immediately removed from the site of the work and satisfactory bricks substituted, at no additional cost to the Owner.
  1. Bricks for the channels and shelves shall comply with the latest specifications of ASTM C32 for Sewer Brick, Grade SM.
  2. Bricks for building up and leveling manhole frames shall conform to ASTM C32 Grade MS.
  3. Poured concrete inverts will not be allowed.

- B. Mortar used in the brickwork shall be composed of one part Type II portland cement conforming to ASTM C150 to two parts sand to which a small amount of hydrated lime not to exceed 10 lbs. to each bag of cement shall be added.
- C. Sand used shall be washed, cleaned, screened, sharp and well graded as to different sizes and with no grain larger than will pass a No. 4 sieve. Sand shall be free from vegetable matter, loam, organic or other materials of such nature or of such quantity as to render it unsatisfactory.
- D. Hydrated lime shall conform to ASTM C207, Type S.

### 2.3 MANHOLE FRAMES AND COVERS

- A. Manhole frames and covers shall be of good quality, strong, tough, even grained cast iron, smooth, free from scale, lumps, blisters, sand holes and defects of any kind. Manhole covers and frame seats shall be machined to a true surface. Castings shall be thoroughly cleaned and subject to hammer inspection. Cast iron shall conform to ASTM A48, Class 30B or ASTM A48, Class 35B.
- B. Manhole covers shall have a diamond pattern, pickholes and the word "SEWER" or "DRAIN", as appropriate, cast in 3 inch letters. Manhole frame and covers shall be manufactured by East Jordan Iron Works; Mechanics Iron Foundry; Neenah Foundry or equal.
- C. Manhole frames and covers shall comply with the detail shown on the Drawings.
- D. Manhole frames and covers shall be designed for a minimum of AASHTO HS20-44 loading.

### 2.4 CATCH BASIN FRAMES AND GRATES

- A. Catch basin frames and grates shall be of good quality, strong, tough, even grained cast iron, smooth, free from scale, lumps, blisters, sand holes and defects of any kind which render them unfit for the service for which they are intended. Grate and frame seats shall be machined to a true surface. Castings shall be thoroughly cleaned and subject to hammer inspection. Cast iron shall conform to ASTM A48, Class 30B or ASTM A48, Class 35B.
- B. The catch basin frames and grates shall comply with the details shown on the Drawings.
- C. Catch basin frames and grates shall be designed for a minimum of AASHTO HS20-44 loading.

### 2.5 JOINTING PRECAST MANHOLE SECTIONS

- A. Tongue and groove joints of precast manhole sections shall be sealed with a preformed flexible joint sealant. The preformed flexible joint sealant shall conform to ASTM C990.

### 2.6 MANHOLE RUNGS

- A. Manhole rungs shall be drop front design, 14 inches wide with an abrasive step surface, steel reinforced, copolymer, polypropylene, plastic. Manhole rungs shall conform to OSHA requirements.

## 2.7 FLEXIBLE PIPE TO-STRUCTURE CONNECTORS

- A. The flexible pipe-to-structure connectors shall be designed to provide a positive seal between the connector and the structure wall and between the connector and the pipe.
- B. The flexible boot shall be manufactured of EPDM synthetic rubber in accordance with ASTM C443 and C923 and shall be 3/8 inch thick or greater.
- C. The external bands shall be made entirely of 304 series non-magnetic stainless steel.
- D. The flexible connectors shall be provided with a wedge-type or toggle-type expander to secure the pipe in the structure opening.
- E. The flexible connectors shall meet the following criteria, in accordance with ASTM C923:
  - 1. Shall not leak when subjected to a head pressure of 10 psi for 10 minutes.
  - 2. Shall have the ability to deflect 7 degrees in any direction without leakage under the head pressure conditions described above.
  - 3. Shall not leak when subject to a load of 150 lbs./in. pipe diameter and the head pressure conditions described above.

## 2.8 DAMPPROOFING

- A. Dampproofing is required for all sanitary sewer structures.
- B. Provide two coats of bituminous dampproofing on outer surfaces of precast manholes at the rate of 20-25 square feet per gallon in accordance with manufacturer's instructions.
- C. Dampproofing coating shall be a factory-applied asphalt compound specially made to adhere to below grade concrete structures.
- D. The dampproofing shall be Sonoshield semi-mastic, as manufactured by BASF; Dehydratine 4 by Euclid Chemical; RIW Marine Liquid by Toch Brothers; or equal.

## 2.9 NON-SHRINK, WATER-PROOF GROUT

- A. Non-shrink, water-proof grout shall be Hallemite; Waterplug; Embeco; or equal.

## PART 3 EXECUTION

### 3.1 INSTALLATION

- A. Installation
  - 1. Construct manholes and catch basins to the dimensions shown on the Drawings and as specified. Protect all work against flooding and flotation.

2. Set precast concrete barrel sections so as to be plumb and with sections in true alignment with a ¼ inch maximum tolerance to be allowed.
3. Install the precast sections in a manner that will result in a watertight joint. Seal the joints of precast concrete barrel sections with the preformed flexible joint sealant used in sufficient quantity to fill 75% of the joint cavity. Fill the outside and inside precast section joints with non-shrink grout and finish flush with the adjoining surfaces. Plug holes in the concrete barrel sections required for handling or other purposes with a non-shrink, water-proof grout or concrete and rubber plugs, and finish flush on the inside.
4. Backfilling shall be done in a careful manner, bringing the fill up evenly on all sides.

#### B. Pipe Connections

1. For pipes with smooth exterior surfaces (PVC, ductile iron, HDPE pressure pipe, steel, etc), use flexible pipe-to-structure connectors.
2. Where flexible pipe-to-structure connectors cannot be used, such as pipes with rough, irregular or corrugated exterior surfaces (concrete, corrugated metal, HDPE drainage pipe, etc):
  - a. After the new pipe has been set in place, completely fill the hole around the new pipe and structure with non-shrink, water-proof grout.
  - b. Place a 6 inch thick concrete encasement a total of 12 inches in length around the pipe stub adjacent to the exterior wall of the structure. Concrete shall have a 28 day compressive strength of 3,000 psi.

#### C. Manhole Rung Installation

1. Steel reinforced copolymer polypropylene plastic steps shall be press fitted by hand driven hammer into preformed holes in cured precast sections, on 12 inch centers, by the precast concrete manufacturer.

#### D. Brickwork

1. Mix mortar only in such quantity as may be required for immediate use and use before the initial set has taken place. Do not retain mortar for more than one and one-half hours and constantly work over with a hoe or shovel until used. Anti-freeze mixtures will not be allowed in the mortar. No masonry shall be laid when the outside temperature is below 40°F unless provisions are made to protect the mortar, bricks, and finished work from frost by heating and enclosing the work with tarpaulins or other suitable material. The Engineer's decision as to the adequacy of protection against freezing shall be final.

2. Construct channels and shelves of brick as shown on the Drawings. The brick channels shall correspond in shape with the lower half of the pipe. The top of the shelf shall be set at the elevation of the crown of the highest pipe and shall be sloped 1 inch per foot to drain toward the flow through channel. Construct brick surfaces exposed to sewage flow with the nominal 2 inch by 8 inch face exposed (i.e., bricks on edge).
3. Set manhole covers and frames and catch basin frames and grates in a full mortar bed and bricks, a maximum of 12 inches thick for conical tops and 6 inches thick for flat top sections, utilized to assure frame and cover are set to the existing grade. Reset the manhole frames and covers and catch basin frames and grates to final grade prior to placement of final paving.

### 3.2 LEAKAGE TEST

- A. Leak test sewer manholes in conjunction with the pipeline in accordance with Section 02503.

### 3.3 CLEANING

- A. Clean new manholes and catch basins of silt, debris and foreign matter of any kind, prior to final inspection.

END OF SECTION

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## SECTION 02670

### CONSTRUCTION IN WETLANDS

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Timber mats for access during construction
  - 2. Removing and salvaging loam and topsoil
  - 3. Restoration of wetlands

##### 1.2 RELATED SECTIONS

- A. Section 01140 – Work Restrictions
- B. Section 01570 – Temporary Controls
- C. Section 02200 – Site Preparation
- D. Section 02315 – Excavation, Backfill, Compaction and Dewatering

##### 1.3 REFERENCES

- A. Contractor shall comply with the requirements of the Notice of Intent and *Town of Longmeadow Conservation Commission Order of Conditions*, attached to Section 00800.

##### 1.4 SUBMITTALS

- A. Submit a description of methods, sequence of construction, and types of equipment proposed for completing the Work in this Section to ensure compliance with Permits.
- B. Submit proposed timber mat product intended for use, and include manufacturer and literature with product description and performance. Include procedure for cleaning mats before and after use. Also include the names and addresses of similar projects on which timber mats were used and dates of use.

##### 1.5 WORK RESTRICTIONS

- A. Work associated with permits shall not begin until the applicable municipal, state and federal agencies have been notified in accordance with the permit conditions.
- B. Open trenches within wetland areas are restricted to a maximum of three pipe lengths at any one time.
- C. Equipment refueling is not permitted within 100 feet of wetland areas.
- D. The placement of soil stockpiles is restricted within 50 feet of wetland areas.



- E. Comply with all requirements of the Town of Longmeadow Conservation Commission Order of Conditions.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. Haybales, siltation fencing, silt sacks and other erosion control products referred to in this section are detailed on the Drawings and specified in Section 01570, Temporary Controls.
- B. Silt bags described for use during dewatering in this section are specified in Section 02315, Excavation, Backfill, Compaction and Dewatering .
- C. Provide timber construction mats for access to the Work in wetland areas, as described in this section and shown on the Drawings.
  - 1. Timber construction mats shall be a maximum of 16 feet wide.
  - 2. Timber construction mats shall be a hardwood, interlocking mat system manufactured by K.W. Reese, Inc., Northern Tree Services, Inc., American Mat & Timber Co., Empire Mat, or equal.
- D. Provide wetland seed mixture for wetland restoration activities. Seed mixture shall be New England Wetmix, as manufactured by New England Wetland Plants, Inc.
- E. Provide erosion control blankets for wetland restoration activities.
  - 1. Erosion control blanket shall be a short-term single net 100% straw blanket with photodegradable netting on one side.
  - 2. Erosion control blanket shall meet requirements established by the Erosion Control Technology Council (ECTC) Specification, the U.S. Department of Transportation and the Federal Highway Administration's (FHWA) Standard Specification for Type 2.C Short-term Single Net Erosion Control Blanket.
  - 3. Erosion control blanket shall be North American Green S75®, GreenfiX® America WS05, SI Geosolutions Landlok® S1 or equal.

## PART 3 EXECUTION

### 3.1 GENERAL

- A. Limit storage of equipment and materials in the buffer zone, where possible.
- B. Servicing equipment in wetland areas is prohibited. Limit equipment servicing in the buffer zone, where possible.
- C. Do not use calcium chloride or other chemicals for dust control in wetland areas or buffer zones. Use water only for dust control.

### 3.2 TIMBER MAT USE

- A. Determine whether the use of timber mats will be required to minimize the rutting of wetland soils. Work completed during sufficiently dry or frozen conditions may not warrant the use of timber mats.

- B. Prior to installation inspect for and remove all vegetative matter.
- C. Install timber mats in accordance with manufacturer's instructions.
- D. Remove loose soils from mats on a daily basis and dispose in upland areas.
- E. Remove timber mats immediately upon completion of work.

### 3.3 SOIL REMOVAL AND RE-USE

- A. Segregate topsoil/muck from mineral subsoil and stockpile separately within upland area.
- B. Backfill excavation initially with mineral subsoil.
- C. Place wetland topsoil/muck over subsoils and grade to existing contours.

### 3.4 WETLAND RESTORATION

- A. Rough grade soils with construction equipment.
- B. Final grade soils by hand so that contours correspond with adjacent non-impacted wetland contours and are restored to preconstruction conditions.
- C. Spread and incorporate wetland seed mix over wetland area, as shown on the Drawings.
  - 1. Seed the impacted wetland areas by hand broadcasting, at an application rate of one pound of seed per 2,500 square feet.
- D. Install Erosion Control Blanket across extent of restored wetland area, as shown on the Drawings
  - 1. Install erosion control blanket in accordance with the manufacturer's instructions.
  - 2. Staple the blanket to ensure that it stays in the proper position to maximize protection capacities.
- E. Seed, mulch and stabilize all disturbed areas within one week of disturbance.
- F. Do not drive over restored wetlands.
- G. Remove all erosion controls upon establishment of vegetation.

END OF SECTION

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## SECTION 02740

### HOT MIX ASPHALT (HMA) PAVEMENT

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Hot mix Asphalt (HMA) paving, top, and binder course for roads
- B. For the purposes of this Section, Hot Mix Asphalt (HMA) and bituminous concrete have the same meaning.
- C. Related Requirements
  - 1. Section 02315 - Excavation, Backfill, Compaction and Dewatering

##### 1.2 REFERENCES

- A. Commonwealth of Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges," 1988 Edition as amended
- B. ASTM D2041 - Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
- C. AASHTO Standard Specifications for Transportation Materials and Methods of Sampling and Testing, 1990 Edition, as amended
- D. AASHTO M 320
- E. TAI - (The Asphalt Institute) - MS-3 Asphalt Plant Manual
- F. TAI - (The Asphalt Institute) - MS-8 Asphalt Paving Manual

##### 1.3 SUBMITTALS

- A. Job mix formula for each mix specified under this Section.
- B. Certificate indicating the mixes specified meet or exceed the requirements specified herein.

##### 1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with Commonwealth of Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges," 1988 Edition as amended.
- B. Mixing Plant: Conform to Commonwealth of Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges," 1988 Edition as amended.
- C. Obtain materials from same source throughout.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- A. General
  - 1. Bituminous materials shall conform to the requirements of these Specifications.
  - 2. Bitumen delivered to a project or to a mix plant must be accompanied by a proper certificate signed by the producer's authorized representative. Shipments of material not accompanied by a certificate will not be accepted for use in the Work.
- B. Hot Mix Asphalt Paving shall be Class I, Type I-1, as specified in Sections 460 and M3.11.0 of the above referenced Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges," 1988 edition, as amended.
- C. Hot Mix Asphalt
  - 1. Hot Mix Asphalt materials shall meet the requirements of M3.11.0 of the above referenced Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges," 1988 edition, as amended.
  - 2. Only Performance Graded Asphalt Binder grades PG 64-28 or PG 52-34 will be used as modifiers and shall meet the requirements of AASHTO M 320.

## PART 3 EXECUTION

### 3.1 PAVING – GENERAL

- A. Maintain pavement under this Contract during the guarantee period of one year and promptly (within 3 days of notice given by the Engineer) refill and repave areas which have settled or are otherwise unsatisfactory for traffic.
- B. All pavement thicknesses referred to herein are compacted thicknesses. Place sufficient mix to ensure that the specified thickness of pavement results.
- C. Regardless of temperature, no permanent mix conforming to the requirements of these specifications shall be placed after October 31 or before May 1 of any year.
- D. When the air temperature falls below 50°F, extra precautions shall be taken in drying the aggregates, controlling the temperatures of the materials and placing and compacting the mixtures.
- E. Existing drainage patterns shall not be altered by the new pavement construction unless otherwise shown on the Drawings.
- F. Furnish and spread calcium chloride on disturbed surfaces to control dust conditions when necessary, or upon direction of the Engineer.

- G. In no case will pavement be placed until the gravel base is dry and compacted to at least 92.0% maximum density at optimum moisture content.
- H. All pavement edges that have been damaged shall be sawcut again if necessary to re-establish a straight clean line between the existing pavement and trench patch.
- I. Tack Coats
  - 1. Apply tack coat on the binder prior to placing the top course. The tack coat shall be RS-1 emulsion and shall be applied at a rate of 0.05 gallons per square yard on binder courses and streets to be overlaid.
  - 2. The edges of the existing pavement where the joints are to be formed shall be thoroughly coated with tack coat to ensure adhesion between the two pavements.
  - 3. The contact surfaces of curbs, castings, and other structures shall be painted with a tack coat prior to placement of paving.
- J. Top course mixes shall provide for 4% air voids in the finished product. The initial in-place voids shall not exceed 7.5%. Final in-place voids shall not be below 2.5%. Additional asphalt content shall not be added for the sole purpose of reducing the in-place voids. If the in-place voids are too high or the paving is expected to occur during cold weather, more compactive effort will be required to adjust the void content rather than increasing the asphalt content.
- K. Breakdown rolling shall not occur before the HMA has cooled to a temperature of 320 degrees Fahrenheit, and shall be completed before the HMA mat has cooled to a temperature of 275 degrees Fahrenheit. Intermediate rolling shall be completed prior to the HMA mat attaining a temperature of 200 degrees Fahrenheit. Finish rolling shall be completed prior to the HMA mat attaining a temperature of 150 degrees Fahrenheit. Roller and paver speeds shall be agreed upon with the Engineer prior to placing HMA to ensure mix temperature requirements will be met.
- L. Thermal segregation of the HMA shall be limited to a maximum of 20 degrees Fahrenheit.
- M. Cascading HMA material on the top of the finished mat with rakes or shovels will not be permitted. Coarse Aggregate dislodged as a result of unavoidable hand work shall be removed from the surface prior to rolling.
- N. Place and compact HMA materials by steel-wheeled rollers of sufficient weight to compact the HMA to 92.5% of the calculated **Theoretical Maximum Density (TMD)** in accordance with ASTM D2041.

- O. Along curbs, structures and all other places not accessible with a roller, the paving mixture shall be thoroughly compacted with tampers. Such tampers shall not weigh less than 25 pounds and shall have a tamping face no more than 50 square inches in size. The surface of the mixture after compaction shall be smooth and true to the established line and grade.
- P. No vehicular traffic shall be permitted on the newly completed pavement until adequate stability has been attained and the material has cooled to below 140 degrees Fahrenheit or sufficiently to prevent distortion or loss of fines. HMA delivery trucks (loaded or empty) shall not be permitted on the newly completed pavement until the asphalt has cooled to below 90 degrees Fahrenheit. If the climatic or other conditions warrant, the period of time before opening to traffic may be extended at the discretion of the Engineer.
- Q. Following all paving, the area along the edge of all pavement shall be backed up with gravel, or loam and seed as required, so that it is flush with the adjacent paving. Whenever possible, the final surface of the backup material shall slope away from the surface edge for drainage runoff.
- R. Following all paving, clean all catch basins and remove and dispose of all debris.

### 3.2 PAVING – HMA PAVING, TOP COURSE FOR ROADS

- A. Prior to placing full-width permanent HMA, notify Engineer of the intended work area at least 24 hours prior to start of work, so that Engineer can adequately inform residents regarding impacts to road access, driveways, detours, and work hours.

### 3.3 PAVING – BINDER COURSE

- A. Place binder course as soon as possible after the gravel base has been prepared, shaped and compacted for all streets.
- B. Binder course shall be placed on reclaimed or fully reconstructed roads as shown on the Drawings and as specified herein in preparation for the full-width top course.
- C. Structure Adjustments
  - 1. All manhole frames, catch basin frames and utility boxes are to be lowered prior to placement of the binder course. After placing the binder course, they shall be raised to the grade of the binder course until such time as the top course is placed, unless the period of time between the placement of the binder course and the placement of the top course is less than 2 weeks, in which case the frames may be raised to the grade of the top course. All excavated materials removed for raising of the frames and utility boxes are to be replaced with concrete. This ring of concrete shall be filled flush with the surrounding binder course.

2. Adjustments to existing municipally owned utility structures and appurtenances such as drainage manholes, catch basins and gate valve boxes, both within the area of excavation and within the existing paved surface, will be carried out by the Contractor prior to installation of the top course. The raising of other structures (privately owned utilities) as required to properly complete the final paving work should be completed by the structure owners. It is the responsibility of the Contractor to coordinate all such work and to assure that all structures are properly raised in a timely manner.
- D. Maintain binder course in a condition suitable for traffic throughout the construction period. Defects shall be repaired within 3 days of notification.
- E. Prepare the binder course for placement of the top course. The base shall be graded prior to the placement of the binder course. The binder course shall be regraded, placing additional HMA where settling has occurred, repairing the existing surface and replacing broken or damaged sections at no additional cost to the Owner. The binder course surface shall be in all respects acceptable to the Engineer before the final pavement is placed. The surface shall then be broom cleaned.

### 3.4 FULL-WIDTH TOP COURSE

- A. Roads shall be fully reconstructed as shown on the Drawings and as specified herein in preparation for the full-width top course.
- B. Prior to the start of spreading the permanent HMA top course the road surface shall be prepared. This shall include, but not be limited to sweeping, repairing, removing of debris, adjustment of all structures for the finished, compacted overlay thickness, and tack coating the surface of the road to be overlaid.
- C. Surface preparation shall also include filling and shimming all trench repair and pavement areas that have not been milled, reclaimed or reconstructed which require preparation prior to the placement of the overlay. Overlays shall not be placed over pavement areas with open seams, substantial cracks, pot-holes, depressions or other defects until proper filling and shimming has been completed.
- D. Top course for an overlay shall be laterally "toed-in" to the existing pavement with a 2 foot minimum keyway cut with milling machines.
- E. When top course is placed on a new binder course, a butt joint shall be provided between new pavement and any adjoining road surfaces.
- F. The final surface shall be properly graded and cambered to provide a smooth surface of proper cross-section and blended into all adjacent existing pavements. Any permanent pavement repair that in the opinion of the Engineer does not meet this requirement, or that will form puddles 1/16-inch deep or greater shall be repaired or replaced at the Contractor's expense.
- G. The finished top course shall blend smoothly with all rim elevations of catch basins, manhole covers, gate box covers, and any other utilities, and shall in no way interfere with or alter the existing surface drainage.





END OF SECTION

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## SECTION 02920

### LAWNS AND GRASSES

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes
  - 1. Restoration of all vegetated areas disturbed during construction including:
    - a. Grass surfaces
    - b. Easements
  - 2. Restoration of vegetated areas abutting wetland resource areas
  - 3. Loam, starter fertilizer, lime, lawn seed, and hydric seed
- B. Contractor shall comply with the requirements of the Notice of Intent and Town of Longmeadow Conservation Commission Order of Conditions, attached to Section 00800.

##### 1.2 SUBMITTALS

- A. Lawn seed mixture including percent by weight of each seed type, and manufacturer/Supplier name.
- B. Suitable laboratory analysis of the topsoil to determine the quantity of fertilizer and lime to be applied.
- C. Lime and starter fertilizer application rates based on laboratory soil tests.
- D. A sworn certificate indicating each variety of seed, weed content, germination of seed, net weight, date of shipment and manufacturer's name shall accompany each seed shipment.

##### 1.3 QUALITY ASSURANCE

- A. Place seed only between the periods from April 15<sup>th</sup> to June 1<sup>st</sup>, and from August 15<sup>th</sup> to October 1<sup>st</sup>, unless otherwise approved by the Engineer.

#### PART 2 PRODUCTS

##### 2.1 MATERIALS

- A. Loam
  - 1. Loam from offsite, as required for Work, shall be taken from a well-drained, arable site, and shall be free of subsoil, large stones, earth clods, sticks, stumps, clay lumps, roots or other objectionable, extraneous matter or debris. Loam shall also be free of quack-grass rhizomes, Agropyron Repens, and the nut-like tubers of nutgrass, Cyperus Esculentus, and all other primary noxious weeds. Loam shall not be delivered or used for planting while in a frozen or muddy condition. Topsoil as delivered to the Site or stockpiled shall have pH between 6.0 and 7.0 and shall contain not less than 5 percent or more than 8 percent organic matter as determined by loss of ignition of moisture-free Samples dried at 100 degrees Celsius.

2. Onsite loam may be available from stripping of onsite topsoil. Onsite topsoil shall be tested as specified below and shall be amended as necessary to meet Specification requirements for loam.
3. Soil Analysis: The Contractor shall submit representative Samples of loam, which he intends to bring onto the Site, and Samples of loam from onsite sources, to a Soil and Plant Testing Laboratory acceptable to the Engineer. All reports shall be sent to the Engineer for approval. Samples of loam to be brought to the Site must be approved prior to delivery of soil. Deficiencies in the loam shall be corrected by the Contractor, as directed by the Engineer after review of the testing agency report by a soils consultant. Testing reports shall include the following tests and recommendations.
  - a. Mechanical gradation (sieve analysis) shall be performed and compared to the USDA Soil Classification System.
  - b. The silt clay content shall be determined by a Hydrometer Test.
  - c. Percent of organics shall be determined by an Ash Burn Test or Walkley/Black Test.
  - d. Chemical analysis shall be undertaken for Nitrate Nitrogen, Ammonium Nitrogen, Phosphorus, Potassium, Calcium, Aluminum, Soluble Salts, and acidity (pH).
  - e. Soil analysis tests shall show recommendations for soil additives to correct soils deficiencies as necessary, and for additives necessary to accomplish particular lawn and planting objectives noted.
  - f. All tests shall be performed in accordance with the current standards of the Association of Official Agriculture Chemists.
4. Loam for General Lawn and Site Restoration Areas: Loam shall conform to the following grain size distribution for material passing the #10 sieve:

U.S. Sieve Size Number	Percent Passing	
	Minimum	Maximum
10	100	----
18	84	100
35	63	72
140	26	40
270	22	34
0.002 mm	2	5

<sup>1</sup>The ratio of the particle size for 80% passing ( $D_{80}$ ) to the particle size for 30% passing ( $D_{30}$ ) shall be 6 or less ( $D_{80}/D_{30} < 6$ ).

<sup>2</sup>Maximum size shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 20% by weight of the total sample.

<sup>3</sup>Tests shall be by combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition.

<sup>4</sup>The organic content shall be between 4.0 and 6.0 percent.

B. Typical Sand Amendment

1. Sand to be mixed with topsoil shall meet the following requirements. The material shall be uniformly graded coarse sand consisting of clean, inert, rounded grains of quartz or other durable rock and free from loam or clay, surface coatings, mica, other deleterious materials with the following gradation.

U.S. Sieve Size Number	Percent Passing	
	Minimum	Maximum
10	100	----
18	60	80
35	35	55
60	8	20
140	0	8
270	0	3
0.002 mm	0	0.3

<sup>1</sup>Maximum size shall be one-inch largest dimension. The maximum retained on the #10 sieve shall be 10% by weight of the total sample.

<sup>2</sup>The ratio of the particle size for 70% passing ( $D_{70}$ ) to the particle size for 20% passing ( $D_{30}$ ) shall be 3.0 or less ( $D_{70}/D_{20} < 3.0$ ).

<sup>3</sup>Tests shall be combined hydrometer and wet sieving in compliance with ASTM D422 after destruction of organic matter by ignition.

C. Starter Fertilizer

1. Starter fertilizer shall bear the manufacturer's name and guaranteed statement of analysis, and shall be applied in accordance with the manufacturer's directions.
2. Starter fertilizer shall be Scott's Starter Fertilizer, or equal, with timed nitrogen release to prevent burning.

D. Lime

1. Lime shall be an agricultural type ground limestone.
2. Lime shall be pelletized type for prolonged time release to soil.
3. Lime shall be applied at the rates recommended in the soil analysis.

E. Seed

1. Seed shall be of the previous year's crop.
2. Required properties:

- a. Purity > 90%
  - b. Germination > 80%
  - c. Crop < 0.5%
  - d. Weed < 0.3%
  - e. Noxious Weed – 0%
  - f. Inert < 8%
3. Grass seed shall conform to the following mixture in proportion by weight and weed content and shall pass the minimum percentages of purity and germination as indicated for same.

Natural Area Seed Mix	% Weight
Kentucky 31 Fescue	40%
Palmer Perennial Ryegrass	30%
Birds Foot Trefoil (Empire Variety)	15%
Red Clover	5%
White Clover	5%
Redtop (Streaker Variety)	5%

4. All seed shall comply with State and Federal seed Laws and Regulations.

F. Hydric Seed

- 1. Hydric seed will be composed of the following species in equal percentages by volume:
  - a. Deer-tongue grass (*Panicum clandestinum*); FAC+.
  - b. Soft rush (*Juncus effuses*); FACW+.
  - c. Annual rye (*Lolium multiflorum*); FACU.
  - d. Grass-leaved goldenrod (*Euthamia graminifolia*); FAC.

PART 3 EXECUTION

3.1 RESTORATION

- A. In locations where the Work passes through existing grass, weed brush or tree-surfaced areas that are not covered by a specific lawn repair item, surface restoration shall be as follows:
  - 1. After completion of backfilling, the existing loam and organic ground cover materials that were salvaged during excavation shall be returned to the top of the trench.
  - 2. After natural settlement and compaction has taken place, the trench surface shall be harrowed, dragged and raked as necessary to produce a smooth and level surface.

3. The area is then to be sowed with “orchard grass” or “rye grass” or other such materials to hold the soil and produce a growth similar to that existing prior to construction.

### 3.2 PREPARATION

- A. After rough grading of the subgrade has been completed and approved, the subgrade surface shall be scarified to a depth of four (4) inches. Then furnish and install a layer of loam providing a rolled four (4) inch thickness. Any depressions which may occur during rolling shall be filled with additional loam, regraded and rerolled until the surface is true to the finished lines and grades. All loam necessary to complete the Work under this section shall be supplied by the Contractor.
- B. The ground surface shall be fine graded and raked to prepare the surface of the loam for lime, fertilizer and seed.
- C. The loam shall be prepared to receive seed by removing stones and grading to eliminate water pockets and irregularities prior to placing seed. Finish grading shall result in straight uniform grades and smooth, even surfaces without irregularities to low points.
- D. All stones over one-half (½) inch in diameter remaining on the surface after raking shall be removed.
- E. Shape the areas to the lines and grades required. The Contractor's attention is directed to the scheduling of Loaming and Seeding of graded areas to permit sufficient time for the stabilization of these areas.
- F. All areas disturbed by construction within the property lines and not covered by structures, pavement, or bark mulch shall be loamed and seeded.
- G. Limestone shall be thoroughly incorporated into the loam layer at a minimum rate of 3 ton per acre or more as recommended by the loam analysis in order to provide a pH value of 5.5 to 6.5.
- H. Fertilizer shall be spread on the top layer of loam at the minimum rate of 500 pounds per acre or more as recommended by the loam analysis and worked into the surface

### 3.3 LOAM AND SEED AREAS

- A. For temporary protection of disturbed areas, seed shall be applied at the following rates:
 

Winter Rye (fall seeding)	2.5 pounds per 1,000 square feet
Oats (spring seeding)	2.5 pounds per 1,000 square feet
Mulch	1.5 tons per acre
- B. The seed mixtures shall be applied at a minimum rate of 200 pounds per acre, or 4.5 pounds per 1,000 square feet.
- C. Seed shall be sown at the rates indicated above by rotary or drop spreader. Sowing shall be done on a calm, dry day. Immediately before seeding, the soil

shall be lightly raked. One half the seed shall be sown in one direction and the other half at right angles to the original direction. It shall be lightly raked into the soil to a depth not over 1/4 inch and rolled with a hand roller weighing not over 100 pounds per linear foot of width.

1. Straw mulch shall be applied immediately after seeding at a rate of 1.5 to 2 tons per acre. Mulch that blows or washes away shall be replaced immediately and anchored using appropriate techniques.
  2. The surface shall be watered and kept moist with a fine spray as required, without eroding the soil, until the grass is well established. Any areas, which are not satisfactorily covered with grass, shall be reseeded, and all noxious weeds shall be removed.
- D. Unless otherwise approved, seeding shall be done between the periods from April 15<sup>th</sup> to June 1<sup>st</sup>, and August 15<sup>th</sup> to October 1<sup>st</sup>, when soil conditions and weather are suitable for such Work.

### 3.4 MAINTENANCE

- A. Maintenance shall include watering, weeding, removal of stones and other foreign objects over one half (½) inch in diameter, cutting the grass until final acceptance. Mow at least weekly, removing no more than 30-40 percent of the leaf tissue using well sharpened blades. Mow grass between one (1) and two (2) inches high in the spring and fall. Mowing heights shall be an additional one-half to an inch in the summer to reduce temperature stress. Leave the clippings in place to help recycle essential plant nutrients needed for growth. All bare or dead spots which become apparent shall be properly prepared, re-loamed, limed, aerated, fertilized, and reseeded as many times as necessary to secure a good growth. The entire area shall be maintained, watered and cut until final acceptance of the lawn installation.
- B. The dressed and seeded areas shall be sprinkled with water as necessary from time to time. Signs and barricades should be placed to protect the seeded areas.
- C. To be acceptable, seeded areas shall consist of a uniform stand without bare or dead spots of at least 90 percent established permanent grass species, with uniform count of at least 200 plants per square foot.
- D. The Engineer shall determine whether maintenance shall continue in any part.
- E. After all necessary corrective Work and clean-up has been completed, and maintenance instructions have been received by the Owner, the Engineer will certify in writing the acceptance of the lawns.
- F. Substantial Completion will not be achieved until the seeded areas have demonstrated a satisfactory stand of growth as determined by the Engineer. Seeded areas not demonstrating satisfactory stands as outlined above, as determined by the Engineer, shall be renovated, reseeded and maintained meeting all requirements as specified herein.

END OF SECTION

## SECTION 02950

### MANHOLE SEALING

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Section Includes

1. Chemically sealing and waterproofing existing manhole SMH#2 (Additive Alternate No. 2).

##### 1.2 DESCRIPTION OF WORK

- ###### A.
- Chemical sealing shall be by the Injection Method or equal. Generally, this shall be accomplished by forcing chemical sealing gel materials through a system of pumps and hoses from the interior of the structure to the exterior of the structure. Jetting or driving pipes from the surface that could damage or cause undermining of the manholes shall not be allowed. Uncovering the manholes by excavation of pavements and soil shall not be allowed.

##### 1.3 SAFETY

- ###### A.
- The Contractor's personnel shall have confined space entry and other training as appropriate for the work to be performed. The confined space entry shall be in accordance with the requirements and protocol as specified in 29 CFR 1910.146, Permit Required Confined Spaces, and ASTM D 4276-84.

##### 1.4 SUBMITTALS

- ###### A.
- Manufacturer's product data for chemical gels, patching materials, cementitious coatings, and flexible sealants, including physical properties, surface preparation, application instructions and curing information.
- ###### B.
- Qualifications of applicator
1. Certification stating applicator is licensed and experienced in the application of the specified products.
  2. List of recently completed manhole sealing projects, including project name and location, names of owner and engineer, contact phone numbers, description of products used, substrates and application procedures.

##### 1.5 QUALITY ASSURANCE

###### A. Applicator Qualifications

1. Licensed and experienced in the application of the specified products.
2. Employs persons trained for the application of the specified products.



- B. The manufacturer shall have at least 5 years experience in the manufacture of the manhole sealing system being provided for this project. Similarly, the installer shall have at least 5 years experience installing the manhole sealing system being provided for the project.
- C. The manufacturer shall have supplied at least 10 projects of similar size, type of sealing system, and project conditions.
- D. The installer shall have performed manhole sealing similar to that required for this project for at least 10 projects of similar size and project conditions. The job locations and persons to contact for references shall be provided upon request by the Engineer.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.
- B. Storage:
  - 1. Store materials in accordance with manufacturer's instructions.
  - 2. Keep containers sealed until ready for use.
  - 3. Store materials in cool, dry environment.
- C. Protect materials during handling and application to prevent damage.

### PART 2 PRODUCTS

#### 2.1 CHEMICAL SEALING MATERIALS

- A. General
  - 1. Mixing, handling, and application of chemical sealing materials shall be in strict accordance with the manufacturer's recommendations.
  - 2. While being injected, the chemical sealant must be able to react/perform in the presence of water.
  - 3. The cured sealing material must prevent the passage of water through the manhole cracks/joints. The sealing material must withstand submergence in water without degradation, remain flexible after curing, and must be able to withstand freeze/thaw and wet/dry cycles without adversely affecting the seal.
  - 4. The cured sealant must be homogeneous, chemically stable and resistant to acids, alkalis and organics normally found in sewage, and must not be biodegradable.

5. Handling, formulation and storage of the sealing gel compound shall be in strict conformance with the manufacturer's recommendations. The uncured gel shall be delivered to the site in unopened containers, with the date of manufacture clearly indicated; no uncured gel manufactured more than six months prior to the date of application shall be utilized. Any uncured gel compound determined to be more than six months old shall be immediately removed from the site. Once a container of uncured gel has been opened, it shall be used as soon as practically possible. If the container of gel is not used within 24 hours of being opened, ensure that the gel has not been contaminated. Any contaminated gel shall be removed from the site and disposed of.
- B. Acrylamide base gel chemical sealing materials shall have the following characteristics:
1. A minimum of 10% acrylamide base material by weight in the total sealant mix. A higher concentration (%) of acrylamide base material may be used to increase strength or offset dilution during injection.
  2. The ability to tolerate some dilution and react in moving water during injection.
  3. A viscosity of approximately 2 centipoise, which can be increased with additives.
  4. A constant viscosity during the reaction period.
  5. A controllable reaction time from 10 seconds to 1 hour.
  6. The ability to increase mix viscosity, density, gel strength and resistance to shrinkage by the use of additives to the water.
- C. Acrylic base gel chemical sealing material shall have the following characteristics:
1. A minimum of 10% acrylic base material by weight in the total sealant mix. A higher concentration (%) of acrylic base material may be used to increase strength or offset dilution during injection.
  2. The ability to tolerate some dilution and react in moving water during injection.
  3. A viscosity of approximately 2 centipoise, which can be increased with additives.
  4. A constant viscosity during the reaction period.
  5. A controllable reaction time from 5 seconds to 6 hours.
  6. The ability to increase mix viscosity, density, and gel strength by the use of additives.
- D. Urethane base gel chemical sealing material shall have the following characteristics:

1. One part urethane prepolymer thoroughly mixed with between 5 and 10 parts of water weight. The recommended mix ratio is one part urethane prepolymer to 8 parts of water (11% prepolymer).
2. A liquid prepolymer having a solids content of 77% to 83%, specific gravity of 1.04 (8.65 lbs./gal.) and a flash point of 20°F.
3. A liquid prepolymer having a viscosity of 600 to 1200 centipoise at 70°F that can be pumped through 500 feet of 1/2-in. hose with a 1000 psi head at a flow rate of 1 ounce per second.
4. Water used to react the prepolymer shall have a pH between 5 and 9.
5. A cure time of 80 seconds at 40°F, 55 seconds at 60°F, and 30 seconds at 80°F, when 1 part prepolymer is reacted with 8 parts of water only. Cure time shall be adjustable by the use of additives.
6. A relatively rapid viscosity increase of the prepolymer/water mix. Viscosity shall increase from about 10 to 60 centipoise in the first minute for a 1 to 8 prepolymer/water ratio at 50°F.
7. The ability to increase mix viscosity, density, gel strength and resistance to shrinkage by the use of additives to the water.

E. Chemical additives:

1. Grouts injected into near-surface and chimney-corbels areas may require the addition of shrink control agents, gel reinforcing agents and accelerators as listed below:

<b>Sealing Material</b>	<b>Suggested Additive</b>
Acrylamide Gel	Ethylene Glycol
Acrylic Gel	Ethylene Glycol
Urethane Gel	Gel Reinforcing Agent

2. Additives shall be included in the chemical mixes in accordance with the manufacturer's recommendations.

## 2.2 CEMENT PLUGGING, PATCHING AND COATING MATERIALS

- A. The materials used shall be designed, manufactured, and intended for sewer manhole rehabilitation and the specific application in which they are to be used. The materials shall have a proven history of performance in sewer manhole rehabilitation. The materials shall be delivered to the job site in original unopened packages and clearly labeled with the manufacturer's identification and printed instructions. All material shall be stored and handled in accordance with recommendations of the manufacturer and the American Concrete Institute.
- B. Cement plugging materials (for stopping active leaks in concrete and masonry manholes):

1. The plugging material shall be premixed fast-setting, volume-stable waterproof cement consisting of hydraulic cement, graded silica aggregates, and special plasticizing and accelerating agents. It shall not contain chlorides, gypsums, plasters, iron particles, aluminum powder or gas-forming agents, or promote the corrosion of steel it may come in contact with. Set time shall be approximately 1 minute. Ten-minute compressive strength shall be approximately 500 psi and the ultimate compressive strength shall be a minimum of 5,000 psi.
- C. Cement patching, repointing, filling, and repairing materials (for nonleaking holes, cracks, and spalls in concrete and masonry manholes):
1. The patching material shall be premixed, nonshrink cement-based material consisting of hydraulic cement, graded silica aggregates, and special plasticizing and accelerating agents, which has been formulated for vertical or overhead use. It shall not contain chlorides, gypsums, plasters, iron particles, aluminum powder, or gas-forming agents or promote the corrosion of steel it may come into contact with. Set time (ASTM C-191) shall be less than 30 minutes. One-hour compressive strength (ASTM C-109) shall be a minimum of 200 psi and the ultimate compressive strengths (ASTM C-109) shall be a minimum of 5,000 psi. Bond strengths (ASTM C-882 Modified) shall be a minimum of 1,700 psi.
- D. Coating materials (for waterproofing of concrete, block and brick manhole walls, cones and benches):
1. The coating material shall be a high strength, fiber reinforced Portland cement microsilica mortar.
  2. The coating shall have the following physical properties:

Property	Test Method	Value
Compressive Strength	ASTM C-109	>4,000 psi at 1 day >10,000 psi at 28 days
Flexural Strength	ASTM C-293	>1,600 psi at 28 days
Tensile Strength	ASTM C-496	>800 psi at 28 days
Modulus of Elasticity	ASTM C-469	>4,500,000 psi at 28 days
Sulfide Resistance	ASTM C-267	No weight loss after 90 days in 20,000 ppm aqueous sulfuric acid solution
Bond	ASTM C-882	>2,000 psi
Shrinkage	ASTM C-596	0.0% at 28 days (at 90% RH)
Freeze/Thaw	ASTM C-666	No damage after 300 cycles
Permeability	ASTM C-1202	<300 coulombs

3. Coating shall be PARSON MH LINER, as manufactured by Parson Environmental Products, or equal.

E. Coating material for manhole inverts

1. The coating material for manhole inverts shall be a rapid setting, fiber reinforced, calcium aluminate cement.
2. The manhole invert coating shall have the following physical properties:

Property	Test Method	Value
Compressive Strength	ASTM C-109	>6,700 psi at 1 day >8,000 psi at 7 days >9,000 psi at 28 days
Flexural Strength	ASTM C-348	>1,025 psi at 1 day >1,250 psi at 7 days >1,400 psi at 28 days
Tensile Strength	ASTM C-190	>590 psi at 1 day >685 psi at 7 days >800 psi at 28 days
Bond	ASTM C-321	>160 psi
Shrinkage	ASTM C-596	0.0%
Freeze/Thaw	ASTM C-666	No damage after 100 cycles

3. Coating shall be PARSON RPM, as manufactured by Parson Environmental Products, or equal.

### 2.3 FLEXIBLE SEALANT

- A. Flexible sealant shall be designed to absorb stresses created when cracks and joints move, ensuring a watertight seal.
- B. Flexible sealant shall be a two component, flexible, high strength, corrosion resistant, 100% solids polyamine epoxy/urethane hybrid suitable for installation within a sewer manhole.
- C. Flexible joint sealant shall be PARSONPOXY FP, as manufactured by Parson Environmental Products, or equal.
- D. The flexible sealant shall have the following physical properties:

Property	Test Method	Value
Elongation	ASTM D-412	600%
Tensile Strength	ASTM D-412	1,600 psi
Impact Flexibility	ASTM D-256	120 inch pounds
Hardness, Shore A	ASTM D-2240	80
Adhesion	ASTM D-4541	350 psi (substrate failure)
Slant Shear Strength	ASTM D-638	2,000 psi

## PART 3 EXECUTION

### 3.1 SEALING INSTALLATION

#### A. General

1. Sealing shall be performed during high groundwater conditions, unless directed otherwise by the Owner.

#### B. Chemical Sealing Equipment

1. The basic equipment shall consist of chemical pumps, chemical containers, injection packers, hoses, valves, and all necessary equipment and tools required to seal manholes.
2. The chemical injection pumps shall be equipped with pressure meters that will provide for monitoring pressure during the injection of the chemical sealants.
3. When necessary, liquid bypass lines equipped with pressure-regulating bypass valves will be incorporated into the pumping system.

#### C. Chemical Sealing Procedures

1. At each point of leakage within the manhole structure a hole shall be carefully drilled from within the manhole and shall extend through the entire manhole wall. In cases where there are multiple leaks around the circumference of the manhole, fewer holes may be drilled, providing all leakage is stopped from these holes.
2. Grout ports or sealant injection devices shall be placed in these previously drilled holes in such a way as to provide a watertight seal between the holes and the injection device. A hose, or hoses, shall be attached to the injection device from an injection pump.
3. Chemical sealing materials as specified shall then be pumped through the hose until material refusal is recorded on the pressure gage mounted on the pumping unit or a predetermined quantity of sealant has been injected. Care shall be taken during the pumping operation to insure that excessive pressures do not develop and cause damage to the manhole structure.
4. Upon completion of the injection, the ports shall be removed and the remaining holes filled with mortar and troweled flush with the surface of the manhole walls or other surfaces. The mortar used shall be a nonshrink patching mortar.

### 3.2 MANHOLE INTERIOR COATING INSTALLATION

#### A. Cleaning

1. All concrete and masonry surfaces must be clean. Grease, laitance, loose bricks, mortar, unsound concrete, and other materials must be completely removed.

2. Water blasting utilizing proper nozzles shall be the primary method of cleaning; however, other methods such as wet or dry sandblasting, acid wash, concrete cleaners, degreasers or mechanical means may be required to properly clean the surface. Surfaces on which these other methods are used shall be thoroughly rinsed, scrubbed, and neutralized to remove cleaning agents and their reactant products.
  3. Surface preparation procedures shall be performed in accordance with the coating manufacturer's recommendations.
- B. Stopping infiltration
1. After surface preparation and prior to the application of coatings, infiltration shall either be stopped by chemical grout sealing, plugging, or by installing "bleed" pipes at the base of the manhole.
- C. Patching
1. All loose or disintegrated material shall be removed from the area to be patched or repointed exposing a sound subbase. Holes or voids around steps, joints or pipes, spalled areas, and cavities caused by missing or broken brick shall be patched and missing mortar repointed using a nonshrink patching mortar.
  2. Cracks not subject to movement and greater than 1/16 inch in width shall be routed out to a minimum width and depth of ½ inch and patched with nonshrink patching mortar.
- D. Coating (waterproofing)
1. For brick and block manholes, a waterproof, cementitious coating shall be applied to all surfaces, from and including the manhole bench and invert, up to the bottom of the frame. For precast concrete manholes, a waterproof, cementitious coating shall be applied to the manhole joints and any cracks in the structure.
  2. Prior to installation of coating, apply a test patch to confirm the suitability of the surface for adhesion of the coating and that the final appearance and function will be as the owner expects.
  3. The material shall be applied in accordance with the manufacturer's recommendations to a minimum thickness of ½ inch. When completed, the coating shall be free of any cracks or holes.
  4. The flexible joint sealant allows movement to occur at cracks and joints.
  5. A flexible joint sealant shall be applied in accordance with the manufacturer's recommendations from the manhole frame to 3 ft. below the frame. Minimum thickness shall be 100 mils.
- E. After proper curing of the applied materials, any "bleed" pipes that were used shall be removed, and the holes plugged and coated with the specified materials.
- F. All materials shall be mixed and applied in accordance with the manufacturer's written instructions.

### 3.3 BYPASS OF FLOW

- A. The Contractor shall be responsible for the control of the wastewater flow to avoid interruptions in sewer service while performing manhole rehabilitation.
- B. The Contractor shall prevent the discharge of sewage to the ground surface or basement backups during manhole rehabilitation.
- C. Manhole invert rehabilitation shall be performed in the dry. Provide pumping equipment to bypass the flow around the work area, where necessary. The pump and bypass lines shall be of adequate capacity and size to handle the wastewater flow.
- D. Provide protection of the bypass pump discharge piping and allow continuous access to businesses and homes through the use of devices such as pipe ramps at driveways.

### 3.4 FINAL ACCEPTANCE

- A. After the specified sealing work has been completed, the manholes shall be visually inspected and tested by the Contractor in the presence of the Owner's Project Representative.
- B. Structure Sealing Test
  - 1. Manhole structure seal shall be visually inspected for watertightness against leakage of water into the manhole. All visible leaks and defects observed during inspection shall be repaired to the satisfaction of the Owner's Project Representative.
  - 2. If the groundwater level is not, in the opinion of the Owner's Project Representative, high enough to give a realistic visual inspection, the Contractor shall test the manholes using one of the following methods:

#### a. Exfiltration Testing

- 1) Incoming and outgoing sewer and service lines shall be plugged, the plugs restrained and the manhole filled with water to the top of the manhole frame. A soaking period of up to 1 hour will be allowed if bypassing of the sewage is not required or has been provided for. At the end of this optional soaking period, the manhole shall be refilled with water and the test begun.
- 2) If the water loss exceeds that shown in the following table, the manhole will have failed the test.

<b>Depth of Manhole</b>	<b>Maximum Allowable Loss</b>
under 8 feet deep	1 inch in 5 minutes
over 8 feet deep	1/8-inch per foot of depth in 5 minutes



b. Vacuum Testing

- 1) All incoming and outgoing sewer and service lines shall be plugged, the plugs restrained and the vacuum tester head placed on the manhole frame and sealed. A vacuum of 10 inches Hg shall then be drawn on the manhole and the time measured for the vacuum to drop to 9 inches Hg. This time shall not be less than 40, 50, or 60 seconds for manhole diameters of 48, 60, and 72 inches, respectively. For manholes deeper than 20 feet, the test times shall be increased by 2 seconds per foot of additional manhole depth.
- 2) Manholes that fail shall be reworked and retested by the Contractor at no additional compensation.

3.5 SUPPLEMENTS – DATA SHEETS

A. Supplements listed below are part of this specification

1. Table 02950-1 – Manhole Sealing Summary

**TABLE 02950-1**  
Manhole Sealing Summary

Street	Manhole Number	Diameter (ft)	Depth (ft) <sup>(1)</sup>	Wall Material
Morningside Drive	SMH#2	4	16	Precast

(1) Rim to invert elevation.

END OF SECTION



## SECTION 13285

### ASBESTOS CEMENT PIPE ABATEMENT

#### PART 1 GENERAL

##### 1.1 SUMMARY

###### A. Section Includes

1. Abatement of buried asbestos-containing cement pipe (ACP) also known as transite (trade name). Furnish all labor, materials and equipment and perform all work required to safely remove and legally dispose of all asbestos-containing materials. Retain (or have readily available) an asbestos subcontractor that can provide all insurance, certifications and licenses necessary for asbestos work.

##### 1.2 GENERAL

- A. This section addresses the abatement of buried ACP in order to allow for new pipe replacement, repairs and connections. Furnish all labor, materials and equipment and perform all work required to safely remove and legally dispose of all ACP. Contractor, or their asbestos Subcontractor, shall provide insurance, certifications and licenses necessary for the asbestos work in the event that the piping cannot be removed or separated without breakage to the ACP.
- B. File all necessary notices, obtain all permits and licenses and pay all taxes, fees, and other costs in connection with the work. Obtain all necessary approvals of all governmental departments having jurisdiction.
- C. Provide the required written ten day notification before the start of work to all required state agencies.
- D. Contractor and asbestos Subcontractor are responsible for complying with the most recent asbestos removal and disposal requirements established by all applicable federal, state, and applicable local government laws, statutes, regulations, ordinances, standards, and guidelines. These include DOT, MDLWD, MADOS, MADEP and OSHA asbestos regulations. These abbreviated terms are described below in Paragraph 1.3.

##### 1.3 ABBREVIATIONS

- A. ACM means Asbestos Containing Material
- B. ACP means Asbestos Cement Pipe
- C. MDLWD means Massachusetts Department of Labor and Workforce Development
- D. MADOS means Massachusetts Division of Safety
- E. DOT means Department of Transportation
- F. HEPA means High Efficiency Particulate Air

- G. MADEP means Massachusetts Department of Environmental Protection
- H. MDLWD means Massachusetts Department of Labor and Work Force Development
- I. NIOSH means National Institute for Occupational Safety and Health
- J. OSHA means Federal Occupational Safety and Health Administration
- K. PCM means Phase Contrast Microscopy
- L. PPE means Personal Protective Equipment
- M. USEPA means United States Environmental Protection Agency
- N. WSR means Waste Shipment Record

#### 1.4 SUBMITTALS

- A. Prior to the start of the removal work, prepare and submit the following items.
  - 1. Written, site specific work plan showing the proposed methods for the handling, temporary storing and disposal of ACP.
  - 2. Written, site specific emergency action plan in the event that ACP becomes damaged during the excavation process. This plan shall include details as to how the asbestos licensed Subcontractor will handle damaged pipe, potentially co-mingled with soils and how they will perform a “controlled ACP breakage” in order to remove the ACP from the excavation. The plan shall include asbestos Subcontractor’s intended handling and disposal methods.
  - 3. Documentation of Contractor or asbestos subcontractors’ workers asbestos licenses issued pursuant to applicable state regulations.
  - 4. Documentation of Contractor or asbestos subcontractor workers asbestos training for the handling and disposal of undamaged ACP.
  - 5. If available, historical air monitoring data to support the use of minimal work practices (e.g. wet methods).
  - 6. Copy of asbestos Contractor or asbestos subcontractor’s certificate of insurance for asbestos work.
- B. At the completion of the abatement work, Contractor/subcontractor shall submit a final written report that includes all disposal records (WSR’s), personnel air sampling results, regulatory notifications, etc.

#### 1.5 LOCATION OF WORK

- A. This specification addresses the abatement of buried ACP piping in order to accommodate new piping systems. Approximately 120 linear feet (LF) of ACP water main, and approximately 110 LF of ACP gravity sewer is scheduled for abatement. The ACP lines require excavation and stabilization/shoring requirements in order to safely access.

- B. In lieu of breaking each pipe section via the glovebag technique, separate each pipe joint by pulling the joints apart. All efforts shall be made to not break the pipe. If ACP breakage does not occur, continue with these work practices.
- C. All ACP breakage work must be performed by a licensed and trained asbestos contractor as required by DLWD and DOS.
- D. Should any ACP breakage occur or if after excavation it is realized that breakage must occur in order to separate the piping sections, a licensed asbestos contractor shall be readily available by the next day to perform any breakage or cutting as necessary to successfully remove and dispose of ACP.
- E. Create a work plan to include an emergency action section that if during the progress of work, any breakage occurs, the work in the immediate area will cease and the area will be demarcated for access by licensed asbestos contractors only. The emergency action plan shall then be implemented for the remaining portion of work and all ACP breakage necessary for pipe removal shall be performed by an asbestos contractor, in accordance with these specifications and applicable regulations.

## PART 2 PRODUCTS

### 2.1 EQUIPMENT & SUPPLIES

- A. Waste containers and transportation shall be suitable for loading, temporary storage, transport, and unloading of contaminated waste without risk of ripping, rupture, or exposure to persons, or emissions to the atmosphere. Transportation methods shall comply with all state or local hazardous or special waste regulations for temporary storage, transport, and disposal if such codes are enforced in states in which the waste will be stored, transported, or disposed of. Warning signs and labels shall comply with all federal, state, or local codes and regulations.

## PART 3 EXECUTION

### 3.1 AIR MONITORING

- A. Ambient Air Monitoring
  - 1. Contractor shall conduct appropriate air monitoring as necessary for the purpose of determining the effectiveness of work procedures, and for certifying work areas as clean following removal and cleanup tasks.
- B. Personnel Air Monitoring
  - 1. Contractor and subcontractor shall conduct appropriate personnel exposure monitoring to determine compliance with OSHA requirements. Provide Owner copies of all air sampling results.
- C. Ambient and Personnel air samples shall be analyzed by a laboratory licensed in the Commonwealth of Massachusetts using PCM analysis in accordance with the NIOSH 7400 method. This method is also capable of being performed on site.

### 3.2 ACP ABATEMENT PROCEDURES

- A. ACP in good condition is considered a non-friable material. Non-friable means the material cannot be crushed, crumbled or pulverized with hand pressure, while dry. Non-friable ACP presents minimal health hazards to workers.

ACP that is intentionally cut, broken or significantly damaged is considered friable and presents health hazards to workers who are not properly trained or protected.

In either case, ACP is considered a special waste and must be lawfully handled and disposed of in accordance with applicable regulations. Broken or damaged ACP must also be kept wet at all times. A licensed asbestos abatement Contractor must provide a written notification (by Certified Mail) to applicable regulatory agencies 10 days prior to the start of work.

In accordance with the preceding criteria, the following procedures must be followed during ACP abatement:

1. Use an excavator to excavate the soils to within 6-inches of the ACP system. The remaining soils around each pipe connection/joint shall be removed via hand methods and manual tools so that the pipe or joint is completely exposed and accessible.
2. Place a pipe strap or sling carefully around each pipe section and pull apart manually or by mechanical equipment. Take care to prevent breakage.
3. If the ACP can be removed whole and intact without any breakage (e.g. separated at original joints), then no special work protection requirements are necessary other than air monitoring. However, ACP must be disposed of in a lawful manner as described herein. Unlicensed workers can perform this work so long as breakage does not occur. However, general asbestos training is required for the handling of ACP.
4. If the ACP must be broken or cut or the method of abatement is not working, employ a licensed asbestos subcontractor to implement special work practices as necessary to ensure there are no airborne emissions above regulatory levels. At a minimum, these practices shall include demarcation of the work area limited to use by authorized personnel, wet methods at all times and the use of trained, licensed asbestos workers. In addition, all breakage must be performed from within a full containment or glove bag (if applicable by regulatory standard), coupled with ventilation via HEPA filtration devices. If ACP breakage has occurred and become co-mingled with soil, remove and dispose of as ACM all ACP and a minimum of 6" of soil to a level of no visible debris.
5. All contained work areas where damaged friable ACP or ACM have been removed shall be subject to a post abatement visual inspection.

6. In that decontamination facilities are impractical in trenches, workers shall wear two protective suits and half face respiratory protection as well as all other required PPE.
7. Upon completion of the ACP disturbance, the workers shall remove one suit and proceed to a remote decontamination facility (e.g. wash facilities and disposal area). The second suit can be removed at this area and the workers can perform final decontamination.

### 3.3 ACP CLEANUP AND DISPOSAL PROCEDURES

1. All sections of removed pipe, contaminated soil, used PPE, etc. must be wrapped or bagged within two layers of 6 mil polyethylene sheeting or put into an approved container and labeled appropriately. The label must include the owners name and address as well as appropriate asbestos warnings. The waste can be temporarily stored at the site within a secure, central location so long as the waste and location is labeled in accordance with MADEP regulations, the location is prepared in accordance with the requirements in Section 3.3.2 and the project notification remains active for as long as the waste remains at the temporary site.
2. The disposal material shall be carefully placed into a closed top, lockable waste trailer or “roll off” which is lined with two layers of 6 mil polyethylene sheeting and is labeled with the appropriate orange “2212” placard on all sides of the trailer. Labels must be conspicuous and constructed in accordance with USEPA, OSHA, DOT and MADEP specifications. Comply with the minimum labeling requirements as follows:
  - a. First label: Affixed to the outermost layer (bladder bag) of the container, on all four sides in accordance with 310 CMR 7.15(1)(e):

Caution  
Contains Asbestos Fibers  
Avoid Opening or Breaking Container  
Breathing Asbestos is Hazardous to Your Health
  - b. Second label: Affixed to all containers containing asbestos, in accordance with 29 CFR 1910.1200(f) of OSHA’s Hazard Communication Standard:

Caution  
Contains Asbestos Fibers  
Avoid Creating Dust  
Cancer and Lung Disease Hazard  
Do Not Breathe Asbestos Fibers

- c. Third label: On individual pre-made asbestos bags in accordance with US Department of Transportation regulation on hazardous waste marking 49 CFR parts 171 and 172, Hazardous substance: Final Rule, Published November 21, 1986 and revised February 17, 1987:

RQ Hazardous Substance  
Solid, NOS, ORM-E, NA 9188  
(asbestos)

- d. Fourth label: Waste Generator Label applied to individual bags of ACM waste material:

Town of Longmeadow

Name of Contractor

- 3. For all asbestos waste removed from the site, provide documentation of the transport and disposal including waste shipment records (WSR's), bills of lading and any other applicable records showing that wastes were legally transported and disposed of at an approved asbestos disposal facility. Provide a finalized copy of the WSR to the Owner as part of the final closeout reporting requirements.
- 4. In the event of a water main break or similar type of emergency, the above requirements may be reduced if approved by regulatory agencies. Emergency procedures can reduce work practices, notification time periods, etc., as necessary, to expedite the work and protect drinking water supplies.

END OF SECTION

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