

**DEPARTMENT OF PUBLIC WORKS
Maynard, MA**

**CONTRACT DOCUMENT FOR
DUPLEX PUMP STATION
INSTALLATION
58 SUMMER HILL ROAD**

DEPARTMENT OF PUBLIC WORKS
Justin DeMarco, Director of Public Works

SPEC NO. _____

July • 2023



DIVISION 0 - BIDDING AND CONTRACT REQUIREMENTS

Section

- 00031 - Advertisement for Bids
- 00101 - Information for Bidders
- 00330 - Bid
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- 00820e - Certificate of Final Completion
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SECTION 00031

ADVERTISEMENT FOR BIDS

1. Sealed bids for the **Duplex Pump Station Installation project** shall be received at the office of the **Maynard Department of Public Works, 195 Main Street, Maynard, MA 01754, until 2:00 P.M., Local Time, Wednesday, August 9th, 2023**, and at which time all bids will be publicly opened and read aloud.
2. In general, the nature and general scope of work of the Contract comprises of installation of an E-One Duplex Pump System and associated work including upgrade of electric service and panel to replace existing gravity sewer service with a two-pump system and low-pressure sewer service at 58 Summer Hill Road.

The time for completion of this project is **60 calendar days** from the written Notice to Proceed. The project shall be completed by October 25th, 2023.

3. An electronic copy of the plans and specifications in PDF format will be available **Monday through Friday 8:30 a.m. to 4:00 p.m.** at Stantec Consulting Services, Inc., 45 Blue Sky Drive – 3rd Floor, Burlington, MA 01803, beginning on **Wednesday, July 26, 2023**.

PLAN DEPOSIT: A \$75.00 deposit will be required for each hard copy set of bid document plans and specifications requested by interested bidders. Company checks shall be made payable to Stantec Consulting Services, Inc. Plan deposits are refundable if the bid documents are returned in good condition, as deemed by Stantec, within seven (7) calendar days of the date of the bid opening.

MAIL FEE: Bid documents will be mailed upon request. In addition to the \$75.00 plan deposit fee, a \$25.00 non-refundable mailing fee in the form of a separate company check shall be provided for each set to be mailed or requesting company's Federal Express number.

The contact person for obtaining the bid documents for this project is Michael Thomassen, Facilities Clerk, Stantec Consulting Services, Inc., 45 Blue Sky Drive – 3rd Floor, Burlington, MA 01803, Phone: (781) 221-1261, E-mail: Michael.Thomassen@stantec.com.

The contract documents may be examined at Stantec Consulting Services, Inc., 45 Blue Sky Drive – 3rd Floor, Burlington, MA 01803.

Prebid questions will be accepted until Thursday, August 2nd, 2023 at 3:00 pm. Submit questions via email to Victor Olson from Stantec Consulting Services, Inc., 45 Blue Sky Drive – 3rd Floor, Burlington, MA 01803, Phone: (781) 577-1419, E-mail: Victor.Olson@stantec.com.

4. Each general Bid shall be accompanied by a 5% **Bid Bond issued by a surety licensed to transact business in the Commonwealth of Massachusetts and listed in the Treasury Department's most recent edition of Circular 570, as amended.**
5. **BIDDERS** are required to submit their bid on the form provided. The OWNER reserves the right to waive informalities in Bids, to reject any or all Bids submitted, and to award the contract to the low responsive, eligible bidder whose bid meets the requirements as stated in the Bid Documents.
6. 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. It is the responsibility of the contractor, before bid opening, to request if necessary, any additional information on Minimum Wage Rates for those trades people who may be employed for the proposed work under this contract.

7. No Bid may be withdrawn within 30 Calendar days after the opening of Bids.
8. The successful BIDDER shall furnish 100% Performance Bond and a 100% Payment Bond with a surety company approved by the OWNER, licensed to transact business in the Commonwealth of Massachusetts **and listed in the Treasury Department's most recent edition of Circular 570, as amended.**
9. The bid is issued in accordance with General Law C. 30, s39m governing Public Works Projects.

DEPARTMENT OF PUBLIC WORKS
MAYNARD, MA

DATED: JULY 2023

END OF SECTION

SECTION 00101
INFORMATION FOR BIDDERS
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1. GENERAL

Sealed bids for the **Duplex Pump System Installation** at 58 Summer Hill Road shall be received at the office of the **Department of Public Works, 195 Main Street, Maynard, MA 01754, until 2:00 P.M., Local Time, Wednesday, August 9th, 2023**, and at which time all bids will be publicly opened and read aloud.

Each Bid shall be submitted in a sealed envelope, addressed to **Department of Public Works, 195 Main Street, Maynard, MA 01754**. Each sealed envelope containing a Bid shall be clearly marked on the outside of the envelope as a bid for the "Duplex Pump System Installation" and shall include the name and address of the BIDDER. If forwarded by mail, courier or other delivery method, the sealed envelope containing the Bid shall be enclosed in another envelope addressed to the **Department of Public Works, 195 Main Street, Maynard, MA 01754**.

All Bids shall be made on the required Bid form. All blank spaces for Bid prices shall be filled in, in ink or typewritten and the Bid form shall be fully completed and executed when submitted. Only one copy of the Bid form is required.

The OWNER reserves the right to waive minor informalities in Bids, to reject any or all Bids submitted and to award the contract to the lowest responsible and eligible bidder whose bid meets the requirements as stated in the bid documents. Any Bid may be withdrawn prior to the above scheduled time for the opening of Bids or authorized postponement thereof. Any Bid received after the time and date specified shall not be considered. No BIDDER may withdraw a Bid within 30 days, Saturdays, Sundays, and Holidays excluded, after the actual date of the opening thereof. The time for award of the Contract may be extended by mutual agreement between the OWNER and the BIDDER.

2. COPIES OF BIDDING DOCUMENTS

An electronic copy of the plans and specifications in PDF format will be available **Monday through Friday 8:30 a.m. to 4:00 p.m.** at Stantec Consulting Services, Inc., 45 Blue Sky Drive – 3rd Floor, Burlington, MA 01803, beginning on **Wednesday, July 26, 2023**.

PLAN DEPOSIT: A \$75.00 deposit will be required for each hard copy set of bid document plans and specifications requested by interested bidders. Company checks shall be made payable to Stantec Consulting Services, Inc. Plan deposits are refundable if the bid documents are returned in good condition, as deemed by Stantec, within seven (7) calendar days of the date of the bid opening.

MAIL FEE: Bid documents will be mailed upon request. In addition to the \$75.00 plan deposit fee, a \$25.00 non-refundable mailing fee in the form of a separate company check shall be provided for each set to be mailed or requesting company's Federal Express number.

The contact person for obtaining the bid documents for this project is Michael Thomassen, Facilities Clerk, Stantec Consulting Services, Inc., 45 Blue Sky Drive – 3rd Floor, Burlington, MA 01803, Phone: (781) 221-1261, E-mail: Michael.Thomassen@stantec.com.

The contract documents may be examined at Stantec Consulting Services, Inc., 45 Blue Sky Drive – 3rd Floor, Burlington, MA 01803.

Complete set of Bidding Documents shall be used in preparing Bids; neither OWNER nor ENGINEER assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

The OWNER and the ENGINEER in making copies of Bidding Documents available on the

above terms, do so only for the purpose of obtaining Bids on the work and do not confer a license or grant for any other use.

3. EXAMINATION OF CONTRACT DOCUMENTS AND SITE

Before submitting a Bid, each BIDDER shall:

- A. Examine the Contract Documents thoroughly.
- B. Visit the site to familiarize himself with local conditions that may in any manner affect cost, progress, or performance of the work.
- C. Familiarize himself with federal, state, and local laws, ordinances, rules, regulations that may in any manner affect cost, progress or performance of the work.
- D. Study and carefully correlate BIDDER's observations with the Contract Documents.

Reference is made to those reports of investigations and tests of subsurface and latent physical conditions at the site which have been relied upon by ENGINEER in preparing the Drawings and Specifications. Before submitting his Bid, each BIDDER shall, at his own expense, make such additional investigations and tests as the BIDDER may deem necessary to determine his Bid for performance of the work in accordance with the time, price and other terms and conditions of the Contract Documents.

On request, OWNER will provide each BIDDER reasonable access to the site to conduct such investigations and tests as each BIDDER deems necessary for submission of his Bid. The prospective BIDDER shall restore any area disturbed or damaged to at least its original condition at the prospective BIDDER's sole cost. The OWNER may require, in its sole discretion, reasonable security or other assurances guaranteeing said restoration.

The submission of a Bid shall constitute an incontrovertible representation by the BIDDER that he has complied with every requirement of this Article and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance of the Work.

4. INTERPRETATION

All questions about the meaning or intent of the Bid Documents shall be submitted to ENGINEER in writing. An interpretation of questions which, in the opinion of the ENGINEER, require a written response will be issued by Addenda to the bid and provided to all parties recorded by the issuing office as having received the Bidding Documents not later than 3 days prior to the date set for opening of Bids. Questions received after the deadline for submission of written questions will not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications shall be without legal effect. Prebid questions will be accepted until Wednesday, **August 2nd, 2023, at 3:00 P.M.**

5. BID SECURITY

Each Bid shall be accompanied by a Bid Bond, payable to the OWNER in the amount of five (5%) of the Bid. The OWNER will return the Bid Security of all except the three lowest responsible and eligible BIDDERS within 5 days of the Bid opening. The Bid Security of the two remaining unsuccessful BIDDERS shall be returned within 5 days of execution of the Agreement. The Bid Security of the successful BIDDER shall be retained until the Payment Bond and Performance Bond have been executed and approved, after which it shall be returned.

Sureties providing bonds shall be licensed to transact business in the Commonwealth of Massachusetts and listed in the U.S. Treasury Department's most recent edition of Circular 570, as amended.

6. PERFORMANCE AND PAYMENT BOND

The General Conditions and Supplemental General Conditions set forth the OWNER requirements as to Performance and Payment Bonds. When the successful BIDDER delivers the executed Agreement to OWNER, it shall be accompanied by the required Contract Security.

Attorneys-in-fact who sign Bid Bonds, or Payment Bonds or Performance Bonds shall file with each Bond a current, certified, and effective dated copy of their power of attorney.

Sureties providing bonds shall be licensed to transact business in the Commonwealth of Massachusetts and listed in the U.S. Treasury Department's most recent edition of Circular 570, as amended.

7. AWARD

Award shall be made to the lowest responsible and eligible BIDDER as set forth in G.L. c. 30, Sec. 39M.

The bids shall be evaluated by the OWNER and contract award will be made based on the low aggregate (lump sum) total of the bid items. The basis of the Award shall be the Total Amount of the BASE BID Proposal.

The OWNER may make such investigations as it deems necessary to determine the ability of the BIDDER to perform the work, and the BIDDER shall furnish to the OWNER all such information and data for this purpose as the OWNER may request. The OWNER reserves the right to reject any Bid for any reason that the OWNER determines to be in the public interest or if the evidence submitted by, or investigation of, such BIDDER fails to satisfy the OWNER that such BIDDER is properly responsible and eligible to carry out the obligations of the Agreement and to complete the Work contemplated herein. A conditional or qualified Bid will not be accepted.

No bid may be withdrawn within 30 calendar days after the opening of the bids.

8. CONTRACT TIME

The time for completion of this project is **60 calendar days** from the written Notice to Proceed. . The project shall be completed by October 25th, 2023.

9. LIQUIDATED DAMAGES

Provisions for liquidated damages in the amount of **\$1,500/day** are set forth in the Bid Form and Agreement.

10. BIDDING PROCEDURE (MGL C.30 – S39M)

Bids for the work are subject to the provisions of General laws (ter. Ed.), M.G.L. C. 30, S39M (Non-Building/Public Works Contract), as amended, which requires fair competition for BIDDERS on the construction, reconstruction, alteration, remodeling, repair or demolition of public works projects.

11. ADDITIONAL REQUIREMENTS

A. General Conditions and Supplementary General Conditions

BIDDER's attention is directed to the requirements and information set forth in the General Conditions and Supplementary General Conditions.

B. Massachusetts General Laws and Code of Federal Regulations

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.

C. Wage Rates

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. It is the responsibility of the contractor, before bid opening, to request, if necessary, any additional information on Minimum Wage Rates for those trades people who may be employed for the proposed work under this contract.

D. Work Guarantee

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 all other contract documents, that the strength of all parts of all manufactured equipment shall be adequate and as specified and that the performance test requirements of the Contract shall be fulfilled. This guarantee shall be for a period of one year from and after the date of completion and acceptance of the Work as stated in the final estimate. If part of the Work is accepted in accordance with that subsection of this AGREEMENT titled "Partial Acceptance", the guarantee for that part of the Work shall be for a period of one year from the date fixed for such acceptance.

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 repairs, correction or replacements. If the Contractor neglects to commence making such repairs, corrections or replacements to the satisfaction of the Owner within seven (7) 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, corrections or replacements, and charge the costs, including compensation for additional professional services, to the Contractor.

E. Safety and Health Regulations

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 shall be subject 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.). The Contractor shall comply fully with any and all applicable provisions of these regulations.

12. ACCESSIBILITY AND SAFETY

A. The General Contractor shall provide a safe and accessible project site in accordance with OSHA rules and regulations which shall include a Confined Space Program for the project.

END OF SECTION

SECTION 00330

BID

PART A – Bid

A.1 GENERAL

Proposal of _____ (hereinafter called "CONTRACTOR"), organized and existing under the laws of the State of

_____ doing business as _____

*

*Insert "a corporation," "a partnership," or "an individual" as applicable.

To the Maynard Department of Public Works, Maynard, Massachusetts (hereinafter called "OWNER"): In compliance with your Bid, CONTRACTOR hereby proposes to perform all Work for **Duplex Pump System Installation, 58 Summer Hill Road, Maynard, MA**, in strict accordance with the Contract Documents, within the time set forth therein, and at the prices stated below.

By submission of this Bid, each CONTRACTOR certifies, and in the case of a joint Bid, each party thereto certifies as to his own organization, that this Bid has been arrived at independently, without consultation, communication, or agreement as to any matter relating to this Bid with any other CONTRACTOR or with any competitor.

A.2 DECLARATIONS

The CONTRACTOR declares that no person in the employ of the OWNER is pecuniarily interested in this proposal or in the Contract for the work which he proposes to do, that he has carefully examined the Contract and Specifications and has informed himself fully in regard to all conditions pertaining to the site where the Work is to be done and has carefully estimated the work. He understands that the OWNER, its agents, and employees, are not to be in any manner held responsible for the accuracy of, or bound by, any estimates or plans or locations of underground structures relating to the Work, and that if any have been given or made, they are to be considered solely as a base for filling out and comparing the several proposals.

The CONTRACTOR proposes to furnish all the labor, equipment and materials required for carrying out the work in accordance with the accompanying Specifications and Drawings prepared by Stantec Consulting Services Inc. for the sums specified herein, subject to additions and deductions according to the Specifications, and in all respects according to the terms thereof.

CONTRACTOR hereby agrees to commence Work under this Contract on or before the date to be specified in the Notice to Proceed and to fully complete the Project within **60 CALENDAR DAYS** thereafter. CONTRACTOR further agrees to pay as liquidated damages, the sum of **\$1,200** for each consecutive calendar day thereafter.

The CONTRACTOR proposes and agrees that within 5 days next after the day on which Notice of the Award shall be given to him or mailed to him at the address hereinafter given, he will sign in quintuplicate agreements of the form provided in Section 00531, and will execute and deliver to the OWNER, Bonds in the sums specified, conditioned to faithfully furnish, and do everything required of the CONTRACTOR, with a surety company authorized to do business in Massachusetts.

The CONTRACTOR acknowledges receipt of the following addenda:

No. _____, dated _____, 2023
No. _____, dated _____, 2023
No. _____, dated _____, 2023

It is understood that the quantities given in this proposal are approximate only and are given as a basis for comparison of the proposals. The Owner does not expressly or by implication agree that the actual amount of work will even approximately correspond herewith but reserves the right to increase or decrease the amount of any item of the work listed, and the unit prices quoted in the proposal shall apply without change to such variation in the quantity of each of the items.

A.3 SCHEDULE OF PRICES:

NOTE: This Proposal shall be filled in by the CONTRACTOR with the prices written in both words and numerals. In case of discrepancy between words and numerals, the amount shown in words shall govern.

SCHEDULE OF PRICES

**DUPLEX PUMP SYSTEM INSTALLATION
58 SUMMER HILL ROAD
MAYNARD DEPARTMENT OF PUBLIC WORKS
MAYNARD, MASSACHUSETTS**

ITEM 1 DUPLEX PUMP SYSTEM INSTALLATION, 58 SUMMER HILL ROAD

The work of the CONTRACTOR, being all work required by the contract, is to be completed at the following LUMP SUM price:

_____ Dollars

Total of Item 1 – Duplex Pump System Installation (\$______).
(Figures)

ITEM 2 LEDGE/ROCK EXCAVATION AND REMOVAL

The work of the CONTRACTOR, being all work required for the excavation and removal of ledge or rock, is to be completed at the following UNIT price:

10 Cubic Yards at Unit Price of (_____) Dollars, (\$_____) per Cubic Yard
(Words) (Figures)

Total of Item 2 – Ledge/Rock Excavation and Removal (\$______).
(Figures)

ITEM 3 ELECTRICAL SERVICE UPGRADE, 58 SUMMER HILL ROAD

The work of the CONTRACTOR, being all work required by the contract, is to be completed at the following LUMP SUM price:

_____ Dollars

Total of Item 3 – Electrical Service Upgrade (\$______).
(Figures)

The basis of award will be the total for Items 1, Item 2, and Item 3.

PART B – BID CONDITIONS

The CONTRACTOR understands that the OWNER reserves the right to reject any or all Bids and to waive any informalities in the Bids.

The CONTRACTOR agrees that the Bid shall be valid and may not be withdrawn for a period of 30 Calendar days, after the scheduled closing time for receiving Bids.

Upon receipt of written notice of the acceptance of this Bid, the CONTRACTOR shall execute the formal Contract attached within 5 days and deliver a 100% Performance Bond and a 100% Payment Bond required by the General Conditions.

The Bid security attached in the sum of five percent of the Bid is to become the property of the OWNER in the event the Contract and Bonds are not executed within the time set forth, as liquidated damages for the delay and additional expense to the OWNER caused thereby.

The undersigned agrees to complete the Work of this Contract within **60** consecutive calendar days following the date of the Notice to Proceed.

In case this Bid shall be accepted by the OWNER, and the undersigned shall fail to execute the Contract and furnish satisfactory Bonds, within 5 days from the date of Notice of Award of the Contract, then the OWNER may, at his option, determine that the undersigned has abandoned the Contract, and thereupon, this Bid shall be null and void, and the Bid Security accompanying this Bid shall be forfeited to and become the property of the OWNER, or the penalty of the Bid Bond shall be invoked as liquidated damages for such failure or neglect; otherwise, such Bid Security shall be returned to the undersigned.

"The time period for holding Bids, where Federal approval is not required is 30 days, Saturdays, Sundays, and legal holidays excluded, after the opening of Bids and where Federal approval is required, the time period for holding Bids is 30 days, Saturdays, Sundays, and legal holidays excluded after Federal approval.

The full name and residence of all persons and parties interested in the foregoing Bid as principals are as follows:

PART C - COMPLIANCE WITH TAX LAWS

Pursuant to M.G.L. Ch 62C, s49A, I certify under the penalties of perjury that I, to my best knowledge and belief, have filed all state tax returns and paid all State Taxes Required under law.

PART D - NON-COLLUSION C.30 s39 (a)

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

Certification undersigned is not presently debarred from doing public construction work in the Commonwealth of Massachusetts under the provisions of Section Twenty-Nine F of Chapter Twenty-Nine, or any other applicable debarment provisions of any other Chapter of the General Laws or any rule or regulations promulgated thereunder.

Seal (if corporation)

(Date)

(Name of CONTRACTOR)

By: _____
(Signature)

(Title & Name of Person Signing Bid)

(Business Address of CONTRACTOR)

(Town, State and Zip Code)

(Telephone No.)

END OF SECTION

SECTION 00410

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned _____

—

as Principal, and _____

as Surety, are hereby held and firmly bound unto Department of Public Works, Maynard, Massachusetts as OWNER in

the penal sum of _____

for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed, this _____ day of _____, 2023.

The Condition of the above obligation is such that whereas the Principal has submitted to the Department of Public Works, Maynard, Massachusetts a certain BID, attached hereto and hereby made a part hereof to enter into a contract in writing, for the construction of the 2023 Sewer Rehabilitation, Maynard, Massachusetts.

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish a BOND for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year set forth above.

Principal (L.S.)

Surety

By: _____

REQUIRED- Surety companies executing BONDS shall be licensed to transact business in the Commonwealth of Massachusetts and shall be listed in the Treasury Department's most recent edition of Circular 570, as amended.

END OF SECTION

SECTION 00420

NOTICE OF AWARD

To: _____

PROJECT Description: **CONSTRUCTION OF THE
DUPLEX PUMP SYSTEM INSTALLATION
58 SUMMER HILL ROAD
DEPARTMENT OF PUBLIC WORKS
MAYNARD, MASSACHUSETTS**

The Department of Public Works has considered the Bid submitted by you for the above described Work in response to its Advertisement for Bids dated _____, and Information for Bidders.

You are hereby notified that your Bid has been accepted for items in the amount of \$ _____.

You are required by the Information for Bidders to execute the Agreement and furnish the required CONTRACTOR's Performance Bond, Payment Bond and certificates of insurance within five (5) days, excluding Saturdays, Sundays and legal holidays from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said Bonds within the five (5) days from the date of this Notice, said OWNER shall be entitled to consider all your rights arising out of the OWNER's acceptance of your Bid as abandoned and as a forfeiture of your Bid Security. The OWNER shall be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to the OWNER.

Dated this _____ day of _____, 2023.

Department of Public Works
Maynard, Massachusetts

ACCEPTANCE OF NOTICE

Receipt of the above Notice of Award is hereby acknowledged
by. _____
this the _____ day of _____, 2023.
By _____
Title _____

END OF SECTION

SECTION 00531

AGREEMENT

THIS AGREEMENT, made this _____ day of _____ 2023, by and between the Maynard Department of Public Works, 195 Main Street, Maynard, Massachusetts, 01754, hereinafter called "OWNER" and _____ doing business as (an individual) or (a partnership) or (a corporation) hereinafter called "CONTRACTOR".

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned:

1. The CONTRACTOR will commence and complete the Construction of Duplex Pump Station Installation, 58 Summer Hill Road, Maynard, Massachusetts.

Work of this Contract comprises furnishing materials, labor, permitting, installation of a duplex pump system and related sewer service appurtenances at 58 Summer Hill Road which consists of:

- Maintaining existing sewer flows during construction.
- Installation of a duplex grinder pump system.
- Installation of a 4-inch sewer service line, a new manhole to connect to the pump system.
- Installation of a 1-1/4-inch discharge from the pump system to the sewer main.
- Installation of 2 backwater valves at the sewer discharge from the residence
- Installation of power and control panel for the pump system and indicator alarm lights.
- Installation of power connection to the building's power supply.
- Upgrade of electrical service and panelboard.

2. The CONTRACTOR will furnish all the material, supplies, tools equipment, labor, and other services necessary for the construction and completion of the Project described herein.
3. The CONTRACTOR will commence the Work required by the Contract Documents within fifteen (15) calendar days after the date of the Notice to Proceed and will fully complete the work within sixty (**60**) CALENDAR DAYS thereafter. The CONTRACTOR acknowledges that the date of beginning and the time for completion of the Work are **essential conditions** of the Contract Documents and the CONTRACTOR further agrees to pay as liquidated damages, the sum of **\$1,200** for each consecutive calendar day that the CONTRACTOR shall be in default after the time specified in the Agreement.
4. The CONTRACTOR agrees to perform all the Work described in the Contract Documents and comply with the terms therein for the lump sum price shown in the Bid schedule.
5. The term "Contract Documents" means and includes the following:

- (A) Information for CONTRACTORS
- (B) Price Quotations
- (C) Agreement
- (D) General Conditions
- (E) Supplemental General Conditions
- (F) Special State Conditions
- (G) Payment Bond
- (H) Performance Bond
- (I) Notice of Award
- (J) Notice to Proceed
- (K) Change Order
- (L) Drawings prepared by Stantec Consulting Services Inc.
- (M) Specifications prepared by Stantec Consulting Services Inc., including Divisions 0, 1, and 2.

(N) Addenda:

No. _____, dated _____, 2023
No. _____, dated _____, 2023
No. _____, dated _____, 2023

In the event of any incongruity or conflict among Contract Documents, the more specific instruction or guidance shall apply.

6. The term "Date of Substantial Performance" means the date when work is sufficiently complete and services are performed, in accordance with the Contract Documents, as modified by approved Amendments and Change Orders.
7. The OWNER agrees to make all reasonable efforts to pay to the CONTRACTOR the sum set forth in the CONTRACTOR'S proposal within thirty (30) days of receipt of an invoice detailing the services provided and acceptance from the OWNER of said services.

If any portion of the Contract price is to be paid by a private citizen(s) no work shall be performed until a sum has been deposited with the OWNER Treasurer, upon an estimate made by the board, committee or officer having charge of the work, sufficient to cover the payment for the portion of the said work chargeable to the private citizen(s).

Fees and Reimbursable Costs combined shall not exceed \$ _____ as more fully set forth in the Contractor Documents.

Notwithstanding anything in the Contract Documents to the contrary, any and all payments which the OWNER is required to make under this Contract shall be subject to appropriation or other availability of funds as certified by the OWNER'S Accountant. In the absence of appropriation or availability as certified herein, this Contract shall be immediately terminated without liability for damages, penalties or other charges to the OWNER.

There shall be no further costs, fees, or reimbursable charges due the CONTRACTOR under this Contract unless said fees and/or costs are so set forth in writing. The OWNER will not pay any surcharge or premium on top of the direct out of pocket expenses, if any.

Final payment including any unpaid balance of the Contractor's compensation shall be due and payable when the project is completed, and the related services are complete.

8. The OWNER may retain a portion of the amount otherwise due the CONTRACTOR. Except as Commonwealth Law (Chapter 30, Section 39G of M.G.L.) otherwise provides, the amount the OWNER retains shall be limited to the following:
 - (a) Withholding of not more than 5 percent of the payment claimed until work is substantially complete.
 - (b) When the work is substantially complete (operational or beneficial occupancy), the withheld amount shall be further reduced below 1 percent to only that amount necessary to assure completion.
 - (c) The OWNER may reinstate up to 5 percent withholding if the OWNER determines, at its discretion, that the CONTRACTOR is not making satisfactory progress or there is other specific cause for such withholding.
 - (d) The OWNER may accept securities negotiable without recourse, condition or restrictions, a release of retainage bond, or an irrevocable letter of credit provided by the CONTRACTOR instead of all or part of the cash retainage.

9. Permits, Licenses, Approvals and all other legal or administrative prerequisites to its performance of the Contract shall be secured and paid for by the CONTRACTOR prior to commencement of the Services and shall be maintained throughout the duration of the Contract.

10. Termination and Default

- (a) Without Cause: The OWNER may terminate this Contract on seven (7) calendar days' notice when in the OWNER'S sole discretion it determines it is in the best interests of the OWNER to do so, by providing notice to the CONTRACTOR, which shall be in writing and shall be deemed delivered and received when given in person to the CONTRACTOR, or when received by fax, express mail, certified mail return receipt requested, regular mail postage prepaid or delivered by any other appropriate method evidencing actual receipt by the CONTRACTOR. Upon termination without cause, CONTRACTOR will be paid for services rendered to the date of termination.
- (b) For Cause: If the CONTRACTOR is determined by the OWNER to be in default of any term or condition of this Contract, the OWNER may terminate this Contract on seven (7) days' notice by providing notice to the CONTRACTOR, which shall be in writing and shall be deemed delivered and received when given in person to the CONTRACTOR, or when received by fax, express mail, certified mail return receipt requested, regular mail postage prepaid or delivered by any other appropriate method evidencing actual receipt by the CONTRACTOR.
- (c) Default: The following shall constitute events of a default under the Contract:
(1) any material misrepresentation made by the CONTRACTOR to the OWNER; 2) any failure to perform any of its obligations under this Contract including, but not limited to the following: (i) failure to commence performance of this Contract at the time specified in this Contract due to a reason or circumstance within the CONTRACTOR'S reasonable control, (ii) failure to perform this Contract with sufficient personnel and equipment or with sufficient material to ensure the completion of this Contract within the specified time due to a reason or circumstance within the CONTRACTOR'S reasonable control, (iii) failure to perform this Contract in a manner reasonably satisfactory to the OWNER, (iv) failure to promptly re-perform within a reasonable time the services that were rejected by the OWNER as unsatisfactory, or erroneous, (v) discontinuance of the services for reasons not beyond the CONTRACTOR'S reasonable control, (vi) failure to comply with a material term of this Contract, including, but not limited to, the provision of insurance and non-discrimination, (vii) any other acts specifically and expressly stated in this Contract as constituting a basis for termination of this Contact, and (viii) failure to comply with any and all requirements of state law and/or regulations, and OWNER bylaw and/or regulations.

11. Failure of the CONTRACTOR to comply with any of the terms or conditions of this Contract shall be a material breach of this Contract, and the OWNER shall have all the rights and remedies provided in the Contract Documents, the right to cancel, terminate, or suspend the Contract in whole or in part, the right to maintain any and all actions at law or in equity or other proceedings with respect to a breach of this Contract, including "Damages" including but not limited to costs, attorney's fees or other damages resulting from said breach ("Damages") as well as specific performance, and the right to select among the remedies available to it by all of the above.

12. Statutory Compliance

- (a) This Contract will be construed and governed by the provisions of applicable federal, state and local laws and regulations; and wherever any provision of the Contract or Contract Documents shall conflict with any provision or requirement of federal, state or local law or regulation, then the provisions of law and regulation shall control. Where applicable to the Contract, the provisions of the General Laws are incorporated by reference into this Contract.
- (b) The CONTRACTOR shall comply with all Federal, State and local laws, rules, regulations, policies and orders applicable to the Services provided pursuant to this Contract.

13. Both the OWNER and the CONTRACTOR acknowledge the provisions of the State Conflict of Interest Law (General Laws Chapter 268A), and this Contract expressly prohibits any activity which shall constitute a violation of that law. The CONTRACTOR shall be deemed to have investigated the application of M.G.L. c. 268A to the performance of this Contract.
14. This Contract must include a certification of tax compliance by the CONTRACTOR, as required by General Laws Chapter 62C, Section 49A (Requirement of Tax Compliance by All Contractors Providing Goods, Services, or Real Estate Space to the Commonwealth or Subdivision).
15. The CONTRACTOR shall carry out the obligations of this Contract in compliance with all requirements imposed by or pursuant to federal, State, and local ordinances, statutes, rules and regulations and policies prohibiting discrimination in employment. CONTRACTOR shall not discriminate against any qualified employee or applicant for employment because of race, color, national origin, ancestry, age, sex, religion, physical or mental handicap or sexual orientation.
16. This Contract is binding upon the parties hereto, their successors, assigns and legal representatives (and where not corporate, the heirs and estate of the CONTRACTOR). The CONTRACTOR shall not assign, sublet, or otherwise transfer this Contract, in whole or in part, without the prior written consent of the OWNER, and shall not assign any of the moneys payable under this Contract, except by and with the written consent of the OWNER.
17. This Contract is only binding upon, and enforceable against, the OWNER if: (1) the Contract is signed by a majority of the Select Board; and (2) endorsed with approval by the OWNER'S Accountant as to appropriation or availability of funds.
18. If the CONTRACTOR is a corporation and this Contract is being executed by a party other than its president, it shall endorse upon this Contract (or attach hereto) its Clerk's Certificate certifying the corporate capacity and authority of the party signing this Contract for the corporation. Such certificate shall be accompanied by a letter or other instrument stating that such authority continues in full force and effect as of the date the Contract is executed by the CONTRACTOR. This Contract shall not be enforceable against the OWNER unless and until the CONTRACTOR complies with this section.
19. The CONTRACTOR will carry out the obligations of this Contract in full compliance with all of the requirements imposed by or pursuant to G. L. c. 151, §1, *et seq.* (Minimum Wage Law) and the wage rates as set forth in G.L. c. 149 §26 to 27D (prevailing Wage).
20. To the full extent permitted by law, no official, employee, agent or representative of the OWNER shall be individually or personally liable on any obligation of the OWNER under this Contract.
21. The CONTRACTOR hereby agrees to indemnify, defend and save harmless the OWNER, the OWNER'S officers, agents and employees, from and against any and all damages, liabilities, actions, suits, proceedings, claims, demands, losses, costs, expenses, recoveries and judgments of every nature and description (including attorneys' fees) that may arise in whole or in part out of or in connection with the work being performed or to be performed, or out of any act or omission by the CONTRACTOR, its employees, agents, subcontractors, material men, and anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable. The CONTRACTOR hereby agrees to reimburse the OWNER for damage to its property caused by the CONTRACTOR, its employees, agents, subcontractors or material men, and anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, including damages caused by his, its or their use of faulty, defective, or unsuitable material or equipment, unless the damage is caused by the OWNER'S gross negligence or willful misconduct. The OWNER agrees to make reasonable effort to notify the CONTRACTOR of any duty arising out of this paragraph, but failure to make timely notice will not relieve the CONTRACTOR of any duty under this paragraph.

The foregoing provisions shall not be deemed to be released, waived, limited, or modified in any respect by reason of any surety or insurance provided by the CONTRACTOR under the

Contract.

22. Failure to provide and continue in force the following insurance during the period of this Contract shall be a material breach of this Contract, shall operate as an immediate termination thereof, and the CONTRACTOR hereby agrees to indemnify the OWNER for all losses, claims, and actions resulting from the failure to provide the insurance required by this Article.

All policies shall identify the OWNER as an additional insured (except Workers' Compensation and Professional Liability). The CONTRACTOR must provide notice to the OWNER immediately upon cancellation or modification of the policy. All Certificates of Insurance shall be on the "MIAA" or "ACORD" Certificate of Insurance form, shall contain true transcripts from the policies, authenticated by the proper officer of the Insurer, evidencing in particular those insured, the extent of coverage, the location, and operations to which the insurance applies, the expiration date and the above-mentioned notice clauses.

The CONTRACTOR shall obtain and maintain during the term of this Contract the following insurance coverage from companies licensed to do business in the Commonwealth of Massachusetts and acceptable to the OWNER.

Workers Compensation Insurance: The CONTRACTOR shall provide by insurance for the payment of compensation and the furnishing of other benefits under Chapter 152 of the General Laws of Massachusetts (The Worker's Compensation Act) to all employees of the CONTRACTOR who are subject to the provisions of Chapter 152 of the General Laws of Massachusetts.

Professional Liability Insurance: Liability of \$1 Million per claim and \$3 Million aggregate.

Other Insurance Requirements:

(a) Comprehensive commercial general liability insurance with limits of at least \$1 Million per occurrence and \$3 Million annual aggregate for property damage and \$1 Million per person and \$3 Million per occurrence for bodily injury, which shall include the OWNER as an additional insured, and which shall cover bodily injury, sickness or disease, or death of any person including employees and those persons other than the CONTRACTOR'S employees, and claims insured by usual personal liability coverage, death, or property damage arising out of the Work including injury or destruction of tangible property, including loss of use resulting therefrom.

(b) Motor vehicle insurance for any motor vehicles used in performing the Work, with limits of at least \$500,000 per person, and \$1 Million per accident.

(c) All policies shall identify the OWNER as an additional insured. (except Workers' Compensation and Professional Liability) The CONTRACTOR must provide notice to the OWNER immediately upon the cancellation modification of the policy. All Certificates of Insurance shall be on the "MIAA" or "ACORD" Certificate of Insurance form, shall contain true transcripts from the policies, authenticated by the proper officer of the Insurer, evidencing in particular those insured, the extent of coverage, the location, and operations to which the insurance applies, the expiration date and the above-mentioned notice clauses.

(d) The CONTRACTOR shall obtain and maintain during the term of this Contract the insurance coverage in companies licensed to do business in the Commonwealth of Massachusetts and acceptable to the OWNER.

23. The CONTRACTOR acknowledges and agrees that it is acting as an independent CONTRACTOR for all services rendered pursuant to this Contract, and neither the CONTRACTOR, nor its employees, agents, servants nor any person for whose conduct the CONTRACTOR is responsible shall be considered an employee or agent of the OWNER for any purpose and shall not file any claim or bring any action for any worker's compensation unemployment benefits and compensation for which they may otherwise be eligible as an

OWNER employee as a result of work performed pursuant to the terms of this Contract.

24. Amendments, or waivers of any additional term, condition, covenant, duty or obligation contained in this Contract may be made only by written amendment executed by all signatories to the original Contract, prior to the effective date of the amendment.
25. If any term or condition of this Contract or any application thereof shall to any extent be held invalid, illegal, or unenforceable by a court of competent jurisdiction, the validity, legality, and enforceability of the remaining terms and conditions of this Contract shall not be deemed affected thereby unless one or both parties would be substantially or materially prejudiced.
26. This Contract and any performance herein shall be governed by and be construed in accordance with the laws of the Commonwealth of Massachusetts. Any and all proceedings or actions relating to subject matter herein shall be brought and maintained in the courts of the Commonwealth of Massachusetts or the federal district court sitting in the Commonwealth of Massachusetts, which shall have exclusive jurisdiction thereof. This paragraph shall not be construed to limit any other legal rights of the parties.
27. Any notice permitted or required under the provisions of this Contract to be given or served by either of the parties hereto upon the other party hereto shall be in writing and signed in the name or on the behalf of the party giving or serving the same. Notice shall be deemed to have been received at the time of actual service or three (3) business days after the date of a certified or registered mailing properly addressed. Notice to the CONTRACTOR shall be deemed sufficient if sent to the address set forth on page 1 or furnished from time to time in writing hereafter.
28. This Contract, including all documents incorporated herein by reference, constitutes the entire integrated agreement between parties with respect to the matters described. This Contract supersedes all prior agreements, negotiations, and representations, either written or oral, and it shall not be modified or amended except by a written document executed by the parties hereto.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this Agreement in four (4) copies each of which shall be deemed an original on the date first above written.

Select Board Chairman

Department of Public Works
Maynard, Massachusetts

Approved as to availability of appropriation:

(SEAL)

ATTEST:

CONTRACTOR:

(Company Name)

By: _____
(Signature)

Name: _____
(Please Type) (Title)

Address: _____

Telephone No.: _____

Fax. No.: _____

(SEAL)

ATTEST:

(Signature)

Name: _____
(Please Type)

NOTE: If the CONTRACTOR to whom this Contract is awarded is a corporation, an affidavit giving the principal the right to sign the contract must accompany the executed Contract.

END OF SECTION

SECTION 00610

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

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

and _____
(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto the Department of Public Works, Maynard, Massachusetts,

hereinafter called OWNER, in the penal sum of _____

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

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the OWNER, dated the _____ day of _____, 2023, a copy of which is hereto attached and made a part hereof for the construction of **Duplex Pump System Installation, 58 Summer Hill Road**, for the Department of Public Works, Maynard, Massachusetts.

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

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

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

IN WITNESS WHEREOF, this instrument is executed in four (4) counterparts, each one of which shall be deemed an original, this _____ day of _____, 2023.

ATTEST:

Principal

(Principal Secretary)

By _____ (s)

(SEAL)

(Witness as to Principal)

(Address)

(Address)

(Address)

Surety

ATTEST:

(Surety) Secretary

By _____

Witness as to Surety

Attorney-in-Fact

(Address)

(Address)

NOTE: Date of Bond must not be prior to date of Contract.

If CONTRACTOR is Partnership, all partners should execute Bond.

IMPORTANT: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located.

END OF SECTION

SECTION 00620

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: that

(Name of Contractor)

(Address of Contractor)

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

and _____
(Name of Surety)

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto the Department of Public Works, Maynard, Massachusetts, hereinafter called OWNER, in the penal sum of

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

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain
contract with the OWNER, dated the _____ day of _____ 2023, a copy of which is hereto attached and made
a part hereof for the construction **Duplex Pump System Installation, 58 Summer Hill Road,
Maynard, MA.**

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

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

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

IN WITNESS WHEREOF, this instrument is executed in four (4) counterparts, each of which shall be deemed an original, this the _____ day of _____, 2023.

ATTEST:

Principal

(Principal Secretary)

By _____ (s)

(SEAL)

(Witness as to Principal)

(Address)

(Address)

Surety

ATTEST:

(Surety) Secretary

(SEAL)

Witness as to Surety

By _____
Attorney-in-Fact

(Address)

(Address)

NOTE: Date of Bond must not be prior to date of Contract.

If CONTRACTOR is Partnership, all partners should execute Bond.

IMPORTANT: Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the Project is located.

END OF SECTION

SECTION 00680

NOTICE TO PROCEED

To: _____

Date: _____

Project: **DUPLEX PUMP SYSTEM
INSTALLATION, 58 SUMMER HILL
ROAD
MAYNARD, MA**

**Dates to be filled in upon determination of awarding Quoted work.*

You are hereby notified to commence Work in accordance with the Agreement dated _____, 2023, on or before _____, 2023, and you are to fully complete the work within **60** consecutive calendar days thereafter. The date of completion of all Work is therefore _____, 2023.

Department of Public Works
Maynard, Massachusetts

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO

PROCEED is hereby acknowledged

By _____

this the _____ day

of _____, 2023

By: _____

Title: _____

END OF SECTION

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GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS

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

Addenda--Written or graphic instruments issued prior to the opening of Bids which clarify, correct or change the bidding documents or the Contract Documents.

Agreement--The written agreement between **OWNER** and **CONTRACTOR** covering the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.

Application for Payment--The form accepted by **ENGINEER** which is to be used by **CONTRACTOR** in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

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

Bonds--Bid, performance and payment bonds and other instruments of security.

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 Time, issued on or after the Effective Date of the Agreement.

Contract Document--The Agreement, Addenda (which pertain to the Contract Documents), **CONTRACTOR**'s Bid (including documentation accompanying the Bid and any post-Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all amendments, modifications and supplements issued pursuant to paragraphs 3.4 and 3.5 on or after the Effective Date of the Agreement.

Contract Price--The moneys payable by **OWNER** to **CONTRACTOR** under the Contract Documents as stated in the Agreement (subject to the provisions of paragraph 11.9.1 in the case of Unit Price Work).

Contract Time--The number of days (computed as provided in paragraph 17.2) or the date stated in the Agreement for the completion of the Work.

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

defective--An adjective which when modifying the word Work

refers to Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or 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 14.8 or 14.10).

Drawings--The drawings which show the character and scope of the Work to be performed and which have been prepared or approved by **ENGINEER** and are referred to in the Contract Documents.

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.

ENGINEER--The person, firm or corporation named as such in the Agreement.

Field Order--A written order issued by **ENGINEER** which orders minor changes in the Work in accordance with paragraph 9.5 but which does not involve a change in the Contract Price or the Contract Time.

General Requirements--Sections of Division 1 of the Specifications.

Laws and Regulations; Laws or Regulations--Laws, rules, regulations, ordinances, codes and/or orders.

Notice of Award--The written notice by **OWNER** to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the conditions precedent enumerated therein, within the time specified, **OWNER** will sign and deliver the Agreement.

Notice to Proceed--A written notice given by **OWNER** to **CONTRACTOR** (with a copy to **ENGINEER**) fixing the date on which the Contract Time will commence to run and on which **CONTRACTOR** shall start to perform **CONTRACTOR**'s obligations under the Contract Documents.

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

Partial Utilization--Placing a portion of the Work in service for the purpose for which it is intended (or a related purpose) before reaching Substantial Completion for all the Work.

Project--The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

Resident Project Representative--The authorized representative of **ENGINEER** who is assigned to the site or any part thereof.

Shop Drawings--All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for **CONTRACTOR** to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instruction, diagrams and other information prepared by a Supplier and submitted by **CONTRACTOR** to illustrate material or equipment for some portion of the Work.

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

Subcontractor--An individual, firm or corporation having a direct contract with **CONTRACTOR** or with any other Subcontractor for the performance of a part of the Work at the site.

Substantial Completion--The Work (or a specified part thereof) has progressed to the point where, in the opinion of **ENGINEER** as evidenced by **ENGINEER**'s definitive certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended; or if there be no such certificate issued, when final payment is due in accordance with paragraph 14.13. The terms "substantially complete" and "substantially completed" as applied to any Work refer to Substantial Completion thereof.

Supplementary Conditions--The part of the Contract Documents which amends or supplements these General Conditions.

Supplier--A manufacturer, fabricator, supplier, distributor, materialman or vendor.

Underground Facilities--All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

Unit Price Work--Work to be paid for on the basis of unit prices.

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

Work Directive Change--A written directive 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 physical conditions under which the Work is to be performed as provided in paragraph 4.2 or 4.3 or to emergencies under paragraph 6.22. A Work Directive Change may not change the Contract Price or

the Contract Time, but is evidence that the parties expect that the change directed or documented by a Work Directive Change 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 Time as provided in paragraph 10.2.

Written Amendment--A written amendment of the Contract Documents, signed by **OWNER** and **CONTRACTOR** on or after the Effective Date of the Agreement and normally dealing with the nonengineering or nontechnical rather than strictly Work-related aspects of the Contract Documents.

ARTICLE 2--PRELIMINARY MATTERS

Delivery of Bonds:

2.1. When **CONTRACTOR** delivers the executed Agreement to **OWNER**, **CONTRACTOR** shall also deliver to **OWNER** such Bonds as **CONTRACTOR** may be required to furnish in accordance with paragraph 5.1.

Copies of Documents:

2.2. **OWNER** shall furnish to **CONTRACTOR** up to ten copies (unless otherwise specified in the Supplementary Conditions) of the Contract Documents as are reasonably necessary for the execution of the Work. Additional copies will be furnished, upon request, at the cost of reproduction.

Commencement of Contract Time; Notice to Proceed:

2.3. The Contract Time 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 the thirty days after the Effective Date of the Agreement. In no event will the Contract Time commence to run later than the seventy-fifth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

Starting the Project:

2.4. **CONTRACTOR** shall start to perform the Work on the date when the Contract Time commences to run, but no Work shall be done at the site prior to the date on which the Contract Time commences to run.

Before Starting Construction:

2.5. Before undertaking each part of the Work, **CONTRACTOR** shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. **CONTRACTOR** shall promptly report in writing to **ENGINEER** any conflict, error or discrepancy which **CONTRACTOR** may discover and shall obtain a written interpretation or clarification from **ENGINEER** before proceeding with any Work affected thereby; however, **CONTRACTOR** shall not be liable to **OWNER** or **ENGINEER** for failure to report any conflict, error or

discrepancy in the Contract Documents, unless **CONTRACTOR** had actual knowledge thereof or should reasonably have known thereof.

2.6. Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), **CONTRACTOR** shall submit to **ENGINEER** for review:

2.6.1. an estimated progress schedule indicating the starting and completion dates of the various stages of the Work;

2.6.2. a preliminary schedule of Shop Drawings submissions; and

2.6.3. a preliminary schedule of values for all of the Work which will include quantities and prices of items aggregating the Contract Price and will subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work which will be confirmed in writing by **CONTRACTOR** at the time of submission.

2.7. Before any Work at the site is started, **CONTRACTOR** shall deliver to **OWNER**, with a copy to **ENGINEER**, certificates (and other evidence of insurance requested by **OWNER**) which **CONTRACTOR** is required to purchase and maintain in accordance with paragraphs 5.3 and 5.4, and **OWNER** shall deliver to **CONTRACTOR** certificates (and other evidence of insurance requested by **CONTRACTOR**) which **OWNER** is required to purchase and maintain in accordance with paragraph 5.6 and 5.7.

Preconstruction Conference:

2.8. Within twenty days after the Effective Date of the Agreement, but before **CONTRACTOR** starts the Work at the site, a conference attended by **CONTRACTOR**, **ENGINEER** and others as appropriate will be held to discuss the schedules referred to in paragraph 2.6, to discuss procedures for handling Shop Drawings and other submittals and for processing Applications for Payment, and to establish a working understanding among the parties as to the Work.

Finalizing Schedules:

2.9. At least ten days before submission of the first Application for Payment a conference attended by **CONTRACTOR**, **ENGINEER** and others as appropriate will be held to finalize the schedules submitted in accordance with paragraph 2.6. The finalized progress schedule will be acceptable to **ENGINEER** as providing an orderly progression of the Work to completion within the Contract Time, but such acceptance will neither impose on **ENGINEER** responsibility for the progress or scheduling of the Work nor relieve **CONTRACTOR** from full responsibility therefore. The finalized schedule of Shop Drawing submissions will be acceptable to **ENGINEER** as providing a workable arrangement for processing the submissions. The finalized schedule of values will be acceptable to **ENGINEER** as to form and substance.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

Intent:

3.1. The Contract Documents comprise the entire agreement between **OWNER** and **CONTRACTOR** concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the law of the place of the Project.

3.2. 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 Work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result will be supplied whether or not specifically called for. When words which have a well-known technical or trade meaning are used to describe Work, materials or equipment such words shall be interpreted in accordance with that meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the Laws or Regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest 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. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of **OWNER**, **CONTRACTOR** or **ENGINEER**, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to **ENGINEER**, or any of **ENGINEER**'s consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16. Clarifications and interpretations of the Contract Documents shall be issued by **ENGINEER** as provided in paragraph 9.4.

3.3. If, during the performance of the Work, **CONTRACTOR** finds a conflict, error or discrepancy in the Contract Documents, **CONTRACTOR** shall so report to **ENGINEER** in writing at once and before proceeding with the Work affected thereby shall obtain a written interpretation or clarification from **ENGINEER**; however, **CONTRACTOR** shall not be liable to **OWNER** or **ENGINEER** for failure to report any conflict, error or discrepancy in the Contract Documents unless **CONTRACTOR** had actual knowledge thereof or should reasonably have known thereof.

Amending and Supplementing Contract Documents:

3.4. The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways:

- 3.4.1. a formal Written Amendment,
- 3.4.2. a Change Order (pursuant to paragraph 10.4), or
- 3.4.3. a Work Directive Change (pursuant to paragraph 10.1).

As indicated in paragraph 11.2 and 12.1, Contract Price and Contract Time may only be changed by a Change Order or a Written Amendment.

3.5. In addition, the requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, in one or more of the following ways:

- 3.5.1. a Field Order (pursuant to paragraph 9.5),
- 3.5.2. **ENGINEER**'s approval of a Shop Drawing or sample (pursuant to paragraphs 6.26 and 6.27), or
- 3.5.3. **ENGINEER**'s written interpretation or clarification (pursuant to paragraph 9.4).

Reuse of Documents:

3.6. Neither **CONTRACTOR** nor any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with **OWNER** shall 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**; and they shall not reuse any of them on extensions of the Project or any other project without written consent of **OWNER** and **ENGINEER** and specific written verification or adaptation by **ENGINEER**.

ARTICLE 4-- AVAILABILITY OF LANDS; PHYSICAL CONDITIONS; REFERENCE POINTS

Availability of Lands:

4.1. **OWNER** shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of **CONTRACTOR**. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by **OWNER**, unless otherwise provided in the Contract Documents. If **CONTRACTOR** believes that any delay in **OWNER**'s furnishing these lands, rights-of-way or easements entitles **CONTRACTOR** to an extension of the Contract Time, **CONTRACTOR** may make a claim therefore as provided in Article 12. **CONTRACTOR** shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

Physical Conditions:

4.2.1. **Explorations and Reports:** Reference is made to the Supplementary Conditions for identification of those reports

of explorations and tests of subsurface conditions at the site that have been utilized by **ENGINEER** in preparation of the Contract Documents. **CONTRACTOR** may rely upon accuracy of the technical data contained in such reports, but not upon nontechnical data, interpretations or opinions contained therein or for the completeness thereof for **CONTRACTOR**'s purposes. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6, **CONTRACTOR** shall have full responsibility with respect to subsurface conditions at the site.

4.2.2. **Existing Structures:** Reference is made to the Supplementary Conditions for identification of those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities referred to in paragraph 4.3) which are at or contiguous to the site that have been utilized by **ENGINEER** in preparation of the Contract Documents. **CONTRACTOR** may rely upon the accuracy of the technical data contained in such drawings, but not for the completeness thereof for **CONTRACTOR**'s purposes. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6, **CONTRACTOR** shall have full responsibility with respect to physical conditions in or relating to such structures.

4.2.3. **Reporting of Differing Conditions:** If **CONTRACTOR** believes that:

4.2.3.1. any technical data on which **CONTRACTOR** is entitled to rely as provided in paragraph 4.2.1 and 4.2.2 is inaccurate, or

4.2.3.2. any physical condition uncovered or revealed at the site differs materially from that indicated, reflected or referred to in the Contract Documents, **CONTRACTOR** shall, promptly after becoming aware thereof and before performing any Work in connection therewith (except in an emergency as permitted by paragraph 6.22), notify **OWNER** and **ENGINEER** in writing about the inaccuracy or difference.

4.2.4. **ENGINEER's Review:** **ENGINEER** will promptly review the pertinent conditions, determine the necessity of obtaining additional explorations or tests with respect thereto and advise **OWNER** in writing (with a copy to **CONTRACTOR**) of **ENGINEER**'s findings and conclusions.

4.2.5. **Possible Document Change:** If **ENGINEER** concludes that there is material error in the Contract Documents or that because of newly discovered conditions a change in the Contract Documents is required, a Work Directive Change or a Change Order will be issued as provided in Article 10 to reflect and document the consequences of the inaccuracy or difference.

4.2.6. **Possible Price and Time Adjustments:** In each such case, an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, or any combination thereof, will be allowable to the extent that they are attributable to any such inaccuracy or difference. If **OWNER** and **CONTRACTOR** are unable to agree as to the amount or length thereof, a claim may be made therefore as provided in Article 11 and 12.

Physical Conditions—Underground Facilities:

4.3.1. 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 or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

4.3.1.1. **OWNER** and **ENGINEER** shall not be responsible for the accuracy or completeness of any such information or data; and

4.3.1.2. **CONTRACTOR** shall have full responsibility for reviewing and checking all such information and data, for locating all Underground Documents, for coordination of the Work with the owners of such Underground Facilities during construction, for the safety and protection thereof as provided in paragraph 6.20 and repairing any damage thereto resulting from the Work, the cost of all of which will be considered as having been included in the Contract Price.

4.3.2. Not Shown or Indicated: If an Underground Facility is uncovered or revealed at or contiguous to the site which was not shown or revealed or indicated in the Contract Documents and which **CONTRACTOR** could not reasonably have been expected to be aware of, **CONTRACTOR** shall, promptly after becoming aware thereof and before performing any Work affected thereby (except in an emergency as permitted by paragraph 6.22), identify the owner of such Underground Facility and give written notice thereof to that owner and to **OWNER** and **ENGINEER**. **ENGINEER** will promptly review the Underground Facility to determine the extent to which the Contract Documents should be modified to reflect and document the consequences of the existence of the Underground Facility, and the Contract Documents will be amended or supplemented to the extent necessary. During such time, **CONTRACTOR** shall be responsible for the safety and protection of such Underground Facility as provided in paragraph 6.20. **CONTRACTOR** shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, to the extent that they are attributable to the existence of any Underground Facility that was not shown or indicated in the Contract Documents and which **CONTRACTOR** could not reasonably have been expected to be aware of. If the parties are unable to agree as to the amount or length thereof, **CONTRACTOR** may make a claim therefore as provided in Articles 11 and 12.

Reference Points:

4.4. **OWNER** shall provide engineering surveys to establish reference points for construction which in **ENGINEER**'s judgement are necessary to enable **CONTRACTOR** to proceed with the Work. **CONTRACTOR** shall be responsible for laying out the Work (unless otherwise specified in the General Requirements), shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of **OWNER**. **CONTRACTOR** shall report to **ENGINEER** whenever any reference point 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 by professionally qualified personnel.

ARTICLE 5—BONDS AND INSURANCE

Performance and Other Bonds:

5.1. **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 **CONTRACTOR**'s obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as otherwise provided by Law or Regulation or by the Contract Documents. **CONTRACTOR** shall also furnish such other Bonds as are required by the Supplementary Conditions. All Bonds shall be in the forms prescribed by Law or Regulation or by the Contract Documents and be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Audit Staff Bureau of Accounts, U.S. Treasury Department. All Bonds signed by an agent must be accompanied by a certified copy of the authority to act.

5.2. If the surety on any Bond furnished by **CONTRACTOR** is declared a 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 5.1, **CONTRACTOR** shall within five days thereafter substitute another Bond and Surety, both of which must be acceptable to **OWNER**.

Contractor's Liability Insurance:

5.3. **CONTRACTOR** shall purchase and maintain such comprehensive general liability and other insurance as is appropriate for the Work being performed and furnished and as will provide protection from claims set forth below which may arise out of or result from **CONTRACTOR**'s performance and furnishing of the Work and **CONTRACTOR**'s other obligations under the Contract Documents, whether it is to be performed or furnished by **CONTRACTOR**, by any Subcontractor, by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for whose acts any of them may be liable:

5.3.1. Claims under worker's or workmen's compensation, disability benefits and other similar employee benefit acts;

5.3.2. Claims for damages because of bodily injury, occupational sickness or disease, or death of **CONTRACTOR**'s employees;

5.3.3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than **CONTRACTOR**'s employees;

5.3.4. Claims for damages insured by 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;

5.3.5. 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;

5.3.6. Claims arising out of operation of Laws or Regulations for damages because of bodily injury or death of any person or for damage to property; and

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

The insurance required by the paragraph 5.3 shall include the specific coverage and be written for not less than the limits of liability and coverages provided in the Supplementary Conditions, or required by law, whichever is greater. The comprehensive general liability insurance shall include completed operations insurance. All of the policies of insurance so required to be purchased and maintained (or the certificates or other evidence thereof) shall contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least thirty days' prior written notice has been given to **OWNER** and **ENGINEER** by certified mail. All such insurance shall remain in effect until final payment and at all times thereafter when **CONTRACTOR** may be correcting, removing or replacing defective Work in accordance with paragraph 13.12. In addition, **CONTRACTOR** shall maintain such completed operations insurance for at least two years after final payment and furnish **OWNER** with evidence of continuation of such insurance at final payment and one year thereafter.

Contractual Liability Insurance:

5.4. The comprehensive general liability insurance required by paragraph 5.3 will include contractual liability insurance applicable to **CONTRACTOR**'s obligations under paragraphs 6.30 and 6.31.

Owner's Liability Insurance:

5.5 **OWNER** shall be responsible for purchasing and maintaining **OWNER**'s own liability insurance and, at **OWNER**'s option, may purchase and maintain such insurance as will protect **OWNER** against claims which may arise from operations under the Contract Documents.

Property Insurance:

5.6. Unless otherwise provided in the Supplementary Conditions, **OWNER** shall purchase and maintain property insurance upon the Work at the site to the full insurable value thereof (subject to such deductible amounts as may be provided in Supplementary Conditions or required by Laws or Regulations). This insurance shall include the interests of **OWNER**, **CONTRACTOR**, Subcontractors, **ENGINEER** and **ENGINEER**'s consultants in the Work, all of whom shall be listed as insureds or additional insured parties, shall insure against the perils of fire and extended coverage and shall include "all risk" insurance for physical loss and damage including theft, vandalism and malicious mischief, collapse and water damage, and such other perils as may be provided in the Supplementary Conditions, and shall include damages, losses and expenses arising out of or resulting from any insured loss or incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers, architects, attorneys

and other professionals). If not covered under the "all risk" insurance or otherwise provided in the Supplementary Conditions, **CONTRACTOR** shall purchase and maintain similar property insurance on portions of the Work stored on and off the site or in transit when such portions of the Work are to be included in an Application for Payment.

5.7. **OWNER** shall purchase and maintain such boiler and machinery 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**, Subcontractor, **ENGINEER**, AND **ENGINEER**'s consultants in the Work, all of whom shall be listed as insured or additional insured parties.

5.8. All the policies of insurance (or the certificates or other evidence thereof) required to be purchased and maintained by **OWNER** in accordance with paragraphs 5.6 and 5.7 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least thirty days' prior written notice has been given to **CONTRACTOR** by certified mail and will contain waiver provisions in accordance with paragraph 5.11.2.

5.9. **OWNER** shall not be responsible for purchasing and maintaining any property insurance to protect the interests of **CONTRACTOR**, Subcontractors or others in the Work to the extent of any deductible amounts that are provided in the Supplementary Conditions. The risk of loss within the deductible amount, will be borne by **CONTRACTOR**, Subcontractor 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.

5.10. If **CONTRACTOR** requests in writing that other special insurance be included in the property insurance policy, **OWNER** shall, if possible, include such insurance, and the cost thereof will be charged to **CONTRACTOR** by appropriate Change Order or Written Amendment. 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**.

Waiver of Rights:

5.11.1 **OWNER** and **CONTRACTOR** waive all rights against each other for all losses and damages caused by any of the perils covered by the policies of insurance provided in response to paragraphs 5.6 and 5.7 and any other property insurance applicable to the Work, and also waive all such rights against the Subcontractors, **ENGINEER**, **ENGINEER**'s consultants and all other parties named as insureds in such policies for losses and damages so caused. As required by paragraph 6.11, each subcontract between **CONTRACTOR** and a Subcontractor will contain similar waiver provisions by the Subcontractor in favor of **OWNER**, **CONTRACTOR**, **ENGINEER**, **ENGINEER**'s consultants and all other parties named as insureds. None of the above waivers shall extend to the rights that any of the insured parties may have to the proceeds of insurance held by **OWNER** as trustee or otherwise payable under any policy so issued.

5.11.2. **OWNER** and **CONTRACTOR** intend that any policies provided in response to paragraphs 5.6 and 5.7 shall protect all of the parties insured and provide primary coverage for all losses and damages caused by the perils covered thereby. Accordingly, all such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any of the parties named as insureds or additional insureds, and if the insurers require separate waiver forms to be signed by **ENGINEER** or **ENGINEER**'s consultant **OWNER** will obtain the same, and if such waiver forms are required of any Subcontractor, **CONTRACTOR** will obtain the same.

Receipt and Application of Proceeds:

5.12. Any insured loss under the policies of insurance required by paragraphs 5.6 and 5.7 will be adjusted with **OWNER** and made payable to **OWNER** as trustee for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of paragraph 5.13. **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 or Written Amendment.

5.13. **OWNER** as trustee shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within fifteen days after occurrence of loss to **OWNER**'s exercise of this power. If such objection be made, **OWNER** as trustee shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If required in writing by any party in interest, **OWNER** as trustee shall, upon the occurrence of an insured loss, give bond for the proper performance of such duties.

Acceptance of Insurance:

5.14. If **OWNER** has any objection to the coverage afforded by or other provisions of the insurance required to be purchased and maintained by **CONTRACTOR** in accordance with paragraphs 5.3 and 5.4 on the basis of its not complying with the Contract Documents, **OWNER** shall notify **CONTRACTOR** in writing thereof within ten days of the date of delivery of such certificates to **OWNER** in accordance with paragraph 2.7. If **CONTRACTOR** has any objection to the coverage afforded by or other provisions of the policies of insurance required to be purchased and maintained by **OWNER** in accordance with paragraphs 5.6 and 5.7 on the basis of their not complying with the Contract Documents, **CONTRACTOR** shall notify **OWNER** in writing thereof within ten days of the date of delivery of such certificates to **CONTRACTOR** in accordance with paragraph 2.7. **OWNER** and **CONTRACTOR** shall each provide to the other such additional information in respect of insurance provided by each as the other may reasonably request. Failure by **OWNER** or **CONTRACTOR** to give any such notice of objection within the time provided shall constitute

acceptance of such insurance purchased by the other as complying with the Contract Documents.

Partial Utilization—Property Insurance:

5.15. If **OWNER** finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, such use or occupancy may be accomplished in accordance with paragraph 14.10; provided that no such use or occupancy shall commence before the insurers providing the property insurance have acknowledged notice thereof and in writing effected the 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 lapse on account of any such partial use or occupancy.

ARTICLE 6 -- CONTRACTOR'S RESPONSIBILITIES

Supervision and Superintendence:

6.1. **CONTRACTOR** shall supervise 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, but **CONTRACTOR** shall not be responsible for the negligence of others in the design or selection of a specific means, methods, technique, sequence or procedure of construction which is indicated in and required by Contract Documents. **CONTRACTOR** shall be responsible to see that the finished Work complies accurately with the Contract Documents.

6.2. **CONTRACTOR** shall keep on the Work at all times during its progress a competent resident superintendent, who shall not be replaced without written notice to **OWNER** and **ENGINEER** except under extraordinary circumstances. The superintendent will be **CONTRACTOR**'s representative at the site and shall have authority to act on behalf of **CONTRACTOR**. All communications given to the superintendent shall be as binding as if given to **CONTRACTOR**.

Labor, Materials and Equipment:

6.3. **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. Except in connection with the safety or protection of persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the site shall be performed during regular working hours, and **CONTRACTOR** will not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without **OWNER**'s written consent given after prior written notice to **ENGINEER**.

6.4 Unless otherwise specified in the General Requirements, **CONTRACTOR** shall furnish and assume full responsibility for all 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 furnishing, performance, testing, start-up and completion of the Work.

6.5. All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by **ENGINEER**, **CONTRACTOR** shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable Supplier except as otherwise provided in the Contract Documents; but no provision of any such instructions will be effective to assign to **ENGINEER**, or any of **ENGINEER**'s consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16.

Adjusting Progress Schedule:

6.6. **CONTRACTOR** shall submit to **ENGINEER** for acceptance (to the extent indicated in paragraph 2.9) adjustments in the progress schedule to reflect the impact thereon of new developments; these will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

Substitutes or "Or-Equal" Items:

6.7.1. Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of other Suppliers may be accepted by **ENGINEER** if sufficient information is submitted by **CONTRACTOR** to allow **ENGINEER** to determine that the material or equipment proposed is equivalent or equal to that named. The procedure for review by **ENGINEER** will include the following as supplemented in the General Requirements. Requests for review of substitute items of material and equipment will not be accepted by **ENGINEER** from anyone other than **CONTRACTOR**. If **CONTRACTOR** wishes to furnish or use a substitute item of material or equipment, **CONTRACTOR** shall make written application to **ENGINEER** for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. The application will state that the evaluation and acceptance of the proposed substitute will not prejudice **CONTRACTOR**'s achievement of Substantial Completion on time, whether or not acceptance of the substitute

for use 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 work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which shall be considered by **ENGINEER** in evaluating the proposed substitute. **ENGINEER** may require **CONTRACTOR** to furnish at **CONTRACTOR**'s expense additional data about the proposed substitute.

6.7.2. If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, **CONTRACTOR** may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to **ENGINEER**, if **CONTRACTOR** submits sufficient information to allow **ENGINEER** to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by **ENGINEER** will be similar to that provided in paragraph 6.7.1 as applied by **ENGINEER** and as may be supplemented in the General Requirements.

6.7.3. **ENGINEER** will be allowed a reasonable time within which to evaluate each proposed substitute. **ENGINEER** will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without **ENGINEER**'s prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. **OWNER** may require **CONTRACTOR** to furnish at **CONTRACTOR**'s expense a special performance guarantee or other surety with respect to any substitute. **ENGINEER** will record time required by **ENGINEER** and **ENGINEER**'s consultants in evaluating substitutions proposed by **CONTRACTOR** and in making changes in the Contract Documents occasioned thereby. Whether or not **ENGINEER** accepts a proposed substitute, **CONTRACTOR** shall reimburse **OWNER** for the charges of **ENGINEER** and **ENGINEER**'s consultants for evaluating each proposed substitute.

Concerning Subcontractors, Suppliers and Others:

6.8.1. **CONTRACTOR** shall not employ any Subcontractor, Supplier or other person or organization (including those acceptable to **OWNER** and **ENGINEER** as indicated in paragraph 6.8.2), whether initially or as a substitute, against whom **OWNER** or **ENGINEER** may have reasonable objection. **CONTRACTOR** shall not be required to employ any Subcontractor, Supplier or other person or organization to furnish or perform any of the Work against whom **CONTRACTOR** has reasonable objection.

6.8.2. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers or other persons or organizations (including those who are to furnish the principal items of materials and equipment) to be submitted to **OWNER**

in advance of the specified date prior to the Effective Date of the Agreement for acceptance by **OWNER** and **ENGINEER** and if **CONTRACTOR** has submitted a list thereof in accordance with the Supplementary Conditions, **OWNER's** or **ENGINEER'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 person or organization so identified may be revoked on the basis of reasonable objection after due investigation, in which case **CONTRACTOR** shall submit an acceptable substitute, the Contract Price will be increased by the difference in the cost occasioned by such substitution and an appropriate Change Order will be issued or Written Amendment signed. No acceptance by **OWNER** or **ENGINEER** of any such Subcontractor, Supplier or other person or organization shall constitute a waiver of any right of **OWNER** or **ENGINEER** to reject defective Work.

6.9. **CONTRACTOR** shall be fully responsible to **OWNER** and **ENGINEER** for all acts and omissions of the Subcontractors, Suppliers and other person and organizations performing or furnishing any of the Work under a direct or indirect contract with **CONTRACTOR** just as **CONTRACTOR** is responsible for **CONTRACTOR'S** own acts and omissions. Nothing in the Contract Documents shall create any contractual relationship between **OWNER** or **ENGINEER** and any such Subcontractor, Supplier or other person or organization, nor shall it 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 person or organization except as may otherwise be required by Laws and Regulations.

6.10. The division 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.

6.11. All Work performed for **CONTRACTOR** by a Subcontractor will be pursuant to an appropriate agreement between **CONTRACTOR** and the Subcontractor which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of **OWNER** and **ENGINEER** and contains waiver provisions as required by paragraph 5.11. **CONTRACTOR** shall pay each Subcontractor a just share of any insurance monies received by **CONTRACTOR** on account of losses under policies issued pursuant to paragraphs 5.6 and 5.7.

Patent Fees and Royalties:

6.12. **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. **CONTRACTOR** shall indemnify and hold harmless **OWNER** and **ENGINEER** and anyone directly or indirectly employed by either of them from and against all claims, damages, losses and expenses (including attorneys' fees and court and arbitration costs) arising out of 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, and shall defend all such claims in connection with any alleged infringement of such rights.

Permits:

6.13. 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. **CONTRACTOR** shall pay all charges of utility owners for connections to the Work, and **OWNER** shall pay all charges of such utility owners for capital costs related thereto such as plant investment fees.

Laws and Regulations:

6.14.1. **CONTRACTOR** shall give all notices and comply with all Laws and Regulations applicable to furnishing and 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.

6.14.2. If **CONTRACTOR** observes that the Specifications or Drawings are at variance with any Laws or Regulations, **CONTRACTOR** shall give **ENGINEER** prompt written notice thereof, and any necessary changes will be authorized by one of the methods indicated in paragraph 3.4. If **CONTRACTOR** performs any Work knowing or having reason to know that it is contrary to such Laws or Regulations, and without such notice to **ENGINEER**, **CONTRACTOR** shall bear all costs arising therefrom; however, it shall not be **CONTRACTOR**'s primary responsibility to make certain that the Specifications and Drawings are in accordance with such Laws and Regulations.

Taxes:

6.15. **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.

Use of Premises:

6.16. **CONTRACTOR** shall confine construction equipment, the storage of materials and equipment and the operations of workers to the Project site and land and areas

identified in and permitted by the Contract Documents and other land and areas permitted by Laws and Regulations, rights-of-way, permits and easements, and shall not unreasonably encumber the premises 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 land or areas contiguous thereto, resulting from the performance of the Work. Should any claim be made against **OWNER** or **ENGINEER** by any such owner or occupant because of the performance of the Work, **CONTRACTOR** shall promptly attempt to settle with such other party by agreement or otherwise resolve the claim by arbitration or at law. **CONTRACTOR** shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold **OWNER** and **ENGINEER** harmless from and against all claims, damages, losses and expenses (including, but not limited to, fees of engineers, architects, attorneys and other professionals and court and arbitration costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any such other party against **OWNER** or **ENGINEER** to the extent based on a claim arising out of **CONTRACTOR**'s performance of the Work.

6.17. During the progress of the Work, **CONTRACTOR** shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work **CONTRACTOR** shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by **OWNER**. **CONTRACTOR** shall restore to original condition all property not designated for alteration by the Contract Documents.

6.18. **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.

Record Documents:

6.19. **CONTRACTOR** shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Directive Changes, Field Orders and written interpretations and clarifications (issued pursuant to paragraph 9.4) in good order. Upon completion of the Work, these record documents, samples and Shop Drawings will be delivered to **ENGINEER** for **OWNER**.

Safety and Protection:

6.20. **CONTRACTOR** shall be responsible for initiation, maintaining and supervising all safety precautions and programs in connection with the Work. **CONTRACTOR** shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

6.20.1. all employees on the Work and other persons and organizations who may be affected thereby;

6.20.2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and

6.20.3. 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.

CONTRACTOR shall comply with all applicable Laws and Regulations of any public body having jurisdiction for the safety of persons or property or to protect them 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 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. All damage, injury or loss to any property referred to in paragraph 6.20.2 or 6.20.3 caused, directly or indirectly, in whole or in part, by **CONTRACTOR**, any Subcontractor, Supplier or any other person or organization directly or indirectly employed by any of them to perform or furnish 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 any one employed by either of them or anyone for whose acts either of them may be liable and not attributable, directly or indirectly, in whole or part, to the fault or negligence of **CONTRACTOR**). **CONTRACTOR**'s duties and responsibilities for the safety and 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 14.13 that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.21. **CONTRACTOR** shall designate a responsible representative at the site whose duty shall be the prevention of accidents. This person shall be **CONTRACTOR**'s superintendent unless otherwise designated in writing by **CONTRACTOR** to **OWNER**.

Emergencies:

6.22. In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, **CONTRACTOR**, without special instruction or authorization from **ENGINEER** or **OWNER**, 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. If **ENGINEER** determines that a change in the Contract Documents is required because of the action taken in response to an emergency, a Work Directive Change or Change Order will be issued to document the consequences of the changes or variations.

Shop Drawings and Samples:

6.23. After checking and verifying all field measurements and after complying with applicable procedures specified in the General Requirements, **CONTRACTOR** shall submit to **ENGINEER** for review and approval in accordance with the accepted schedule of Shop Drawing submission (see paragraph 2.9), or for other appropriate action if so indicated in the Supplementary Conditions, five copies (unless otherwise specified in the General Requirements) of all Shop Drawings, which will bear a stamp or specific written indication that **CONTRACTOR** has satisfied **CONTRACTOR**'s responsibilities under the Contract Documents with respect to the review of the submissions. All submissions will be identified as **ENGINEER** may require. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable **ENGINEER** to review the information as required.

6.24. **CONTRACTOR** shall also submit to **ENGINEER** for review and approval with such promptness as to cause no delay in Work, all samples required by the Contract Documents. All samples will have been checked by and accompanied by a specific written indication that **CONTRACTOR** has satisfied **CONTRACTOR**'s responsibilities under the Contract Documents with respect to the review of the submission and will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended.

6.25.1. Before submission of each Shop Drawings or sample **CONTRACTOR** shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each Shop Drawing or sample with other Shop Drawings and samples and with the requirements of the Work and the Contract Documents.

6.25.2. At the time of each submission, **CONTRACTOR** shall give **ENGINEER** specific written notice of each variation that the Shop Drawings or samples may have from the requirements of the Contract Documents, and, in addition, shall cause a specific notation to be made on each Shop Drawing submitted to **ENGINEER** for review and approval of each such variation.

6.26. **ENGINEER** will review and approve with reasonable promptness Shop Drawings and samples, but **ENGINEER**'s review and approval will be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required 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. **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.

6.27. **ENGINEER**'s review and approval of Shop Drawings or samples shall not relieve **CONTRACTOR** from responsibility for any variation from the requirements of the Contract Documents unless **CONTRACTOR** has in writing called **ENGINEER**'s attention each such variation at the time of submission as required by paragraph 6.25.2 and **ENGINEER** has given written approval of each such variation by a specific written notation thereof incorporated in or accompanying the Shop Drawing or sample approval; nor will any approval by **ENGINEER** relieve **CONTRACTOR** from responsibility for errors or omissions in the Shop Drawings or from responsibility for having complied with the provisions of paragraph 6.25.1.

6.28. Where a Shop Drawing or sample is required by the Specifications, any related Work performed prior to **ENGINEER**'s review and approval of the pertinent submission will be the sole expense and responsibility of **CONTRACTOR**.

Continuing the Work:

6.29. **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 dispute or disagreements, except as permitted by paragraph 15.5 or as **CONTRACTOR** and **OWNER** may otherwise agree in writing.

Indemnification:

6.30. To the fullest extent permitted by Laws and Regulations **CONTRACTOR** shall indemnify and hold harmless **OWNER** and **ENGINEER** and their consultants, agents and employees from and against all claims, damages, losses and expenses, direct, indirect or consequential (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) arising out of or resulting from the performance of the Work, provided that any such claim, damage, loss or expense (a) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom and (b) is caused in whole or in part by any negligent act or omission of **CONTRACTOR**, any Subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them are liable, regardless of whether or not it is caused in part by a party indemnified hereunder or arises by or is imposed by Law and Regulations regardless of the negligence of any such party.

6.31. In any and all claims against **OWNER** or **ENGINEER** or any of their consultants, agents or employees by any employee of **CONTRACTOR**, any subcontractor, any person or organization directly or indirectly employed by any of them to perform or furnish any of the Work or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.30 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 or other person or organization under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

6.32. The obligations of **CONTRACTOR** under paragraph 6.30 shall not extend to the liability of **ENGINEER**, **ENGINEER**'s consultants, agents or employees arising out of the preparation or approval of maps, drawings, opinions, reports, survey, Change Orders, designs or specifications.

matters to be covered by such authority and responsibility will be itemized, and the extent of such authority and responsibilities will be provided, in the Supplementary Conditions. Unless otherwise provided in the Supplementary Conditions, neither **OWNER** nor **ENGINEER** shall have any authority or responsibility in respect of such coordination.

ARTICLE 7 -- OTHER WORK

Related Work at Site:

7.1. **OWNER** may perform other work related to the Project at the site by **OWNER**'s own forces, have other work performed by utility owners or let other direct contracts therefore which shall contain General Conditions similar to these. If the fact that such other work is to be performed was not noted in the Contract Documents, written notice thereof will be given to **CONTRACTOR** prior to starting any such other work; and, if **CONTRACTOR** believes that such performance will involve additional expense to **CONTRACTOR** or requires additional time and the parties are unable to agree as to the extent thereof, **CONTRACTOR** may make a claim therefore as provided in Articles 11 and 12.

7.2. **CONTRACTOR** shall afford each utility owner and other contractor who is a party to such a direct contract (or **OWNER**, if **OWNER** is performing the additional work with **OWNER**'s employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work, and shall properly connect and coordinate the Work with theirs. **CONTRACTOR** shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. **CONTRACTOR** shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their 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.

7.3. If any part of **CONTRACTOR**'s Work depends for proper execution or results upon the work of any such other contractor or utility owner (or **OWNER**), **CONTRACTOR** shall inspect and promptly report to **ENGINEER** in writing any delays, defects or deficiencies in such work that render it unavailable or unsuitable for such proper execution and results. **CONTRACTOR**'s failure so to report will constitute an acceptance of the other work as fit and proper for integration with **CONTRACTOR**'s Work except for latent or nonapparent defects and deficiencies in the other work.

Coordination:

7.4. If **OWNER** contracts with others for the performance of other work on the Project at the site, the person or organization who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified in the Supplementary Conditions, and the specific

ARTICLE 8 -- OWNER'S RESPONSIBILITIES

8.1. **OWNER** shall issue all communications to **CONTRACTOR** through **ENGINEER**.

8.2. In case of termination of the employment of **ENGINEER**, **OWNER** shall appoint an engineer against whom **CONTRACTOR** makes no reasonable objection, whose status under the Contract Documents shall be that of the former **ENGINEER**. Any dispute in connection with such appointment shall be subject to arbitration.

8.3. **OWNER** shall furnish the data required of **OWNER** under the Contract Documents promptly and shall make payments to **CONTRACTOR** promptly after they are due as provided in paragraphs 14.4 and 14.13.

8.4. **OWNER**'s duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.1 and 4.4. Paragraph 4.2 refers to **OWNER**'s identifying and making available to **CONTRACTOR** copies of reports of explorations and tests of subsurface conditions at the site and in existing structures which have been utilized by **ENGINEER** in preparing the Drawings and Specifications.

8.5. **OWNER**'s responsibilities in respect of purchasing and maintaining liability and property insurance are set forth in paragraphs 5.5 through 5.8.

8.6. **OWNER** is obligated to execute Change Orders as indicated in paragraph 10.4.

8.7. **OWNER**'s responsibility in respect of certain inspections, tests and approvals is set forth in paragraph 13.4.

8.8. In connection with **OWNER**'s right to stop Work or suspend Work, see paragraphs 13.10 and 15.1. Paragraph 15.2 deals with **OWNER**'s right to terminate services of **CONTRACTOR** under certain circumstances.

ARTICLE 9-- ENGINEER'S STATUS DURING CONSTRUCTION

Owner's Representative:

9.1. **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 and shall not be extended without written consent of **OWNER** and **ENGINEER**.

Visits to Site:

9.2. **ENGINEER** will make visits to the site at intervals appropriate to the various stages of construction to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents. **ENGINEER** will not be required to make exhaustive or continuous on-site inspections 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 to the Contract Documents. On the basis of such visits and on-site observations as an experienced and qualified design professional, **ENGINEER** will keep **OWNER** informed of the progress of the Work and will endeavor to guard **OWNER** against defects and deficiencies in the Work.

Project Representation:

9.3. If **OWNER** and **ENGINEER** agree, **ENGINEER** will furnish a Resident Project Representative to assist **ENGINEER** in observing the performance of the Work. The duties, responsibilities and limitations of authority of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions. If **OWNER** designates another agent to represent **OWNER** at the site who is not **ENGINEER**'s agent or employee, the duties, responsibilities and limitations of authority of such other person will be as provided in the Supplementary Conditions.

Clarifications and Interpretations:

9.4. **ENGINEER** will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as **ENGINEER** may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents. If **CONTRACTOR** believes that a written clarification or interpretation justifies an increase in the Contract Price or an extension of the Contract Time and the parties are unable to agree to the amount or extent thereof, **CONTRACTOR** may make a claim therefore as provided in Article 11 or Article 12.

Authorized Variations in Work:

9.5. **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 Time and are consistent with the overall intent of 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 **CONTRACTOR** believes that a Field Order justifies an increase in the Contract Price or an extension of the Contract Time and the parties are unable to agree as to the amount or extent thereof, **CONTRACTOR** may make a claim thereof as provided in Article 11 or 12.

Rejecting Defective Work:

9.6. **ENGINEER** will have authority to disapprove or reject Work which **ENGINEER** believes to be defective, and will

also have authority to require special inspection or testing of the Work as provided in paragraph 13.9, whether or not the Work is fabricated, installed or completed.

Shop Drawings, Change Orders and Payments:

9.7. In connection with **ENGINEER**'s responsibility for Shop Drawings and samples, see paragraphs 6.23 through 6.29 inclusive.

9.8. In connection with **ENGINEER**'s responsibilities as to Change Orders, see Articles 10, 11 and 12.

9.9. In connection with **ENGINEER**'s responsibilities in respect of Applications for Payment, etc., see Article 14.

Determinations for Unit Prices:

9.10. **ENGINEER** will determine the actual quantities and classifications of Unit Price Work performed by **CONTRACTOR**. **ENGINEER** will review with **CONTRACTOR** **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 decisions thereon will be final and binding upon **OWNER** and **CONTRACTOR**, unless, within ten days after the date of any such decision, either **OWNER** or **CONTRACTOR** delivers to the other party to the Agreement and to **ENGINEER** written notice of intention to appeal from such a decision.

Decisions on Disputes:

9.11. **ENGINEER** will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the performance and furnishing of the Work and claims under Articles 11 and 12 in respect of changes in the Contract Price or Contract Time will be referred initially to **ENGINEER** in writing with a request for a formal decision in accordance with this paragraph, which **ENGINEER** will render in writing within a reasonable time. Written notice of each such claim, dispute and other matter will be delivered by the claimant to **ENGINEER** and the other party to the Agreement promptly (but in no event later than thirty days) after the occurrence of the event giving rise thereto, and written supporting data will be submitted to **ENGINEER** and the other party within sixty days after such occurrence unless **ENGINEER** allows an additional period of time to ascertain more accurate data in support of the claim.

9.12. When functioning as interpreter and judge under paragraph 9.10 and 9.11, **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. The rendering of a decision by **ENGINEER** pursuant to paragraphs 9.10 and 9.11 with respect to any such claim, dispute or other matter (except any which have been waived by the making or acceptance of final payment as provided in paragraph 14.16) will be a condition precedent to any exercise by **OWNER** or **CONTRACTOR** of such rights or

remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such claim, dispute or other matter.

Limitations on ENGINEER's Responsibilities:

9.13. Neither **ENGINEER**'s authority to act under this Article 9 or elsewhere in the Contract Documents nor any decision made by **ENGINEER** in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of **ENGINEER** to **CONTRACTOR**, any Subcontractor, and Supplier, or any other person or organization performing any of the Work, or to any surety for any of them.

9.14. Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed", "as approved", or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper" or "satisfactory" or adjectives of like effect or import are used to describe a requirement, direction, review or judgement of **ENGINEER** as to the Work, it is intended that such requirement, direction, review of judgement will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any term or adjective shall not be effective to assign to **ENGINEER** any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.15 or 9.16.

9.15. **ENGINEER** will not be responsible for **CONTRACTOR**'s means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, and **ENGINEER** will not be responsible for **CONTRACTOR**'s failure to perform or furnish the Work in accordance with the Contract Documents.

9.16. **ENGINEER** will not be responsible for the acts or omissions of **CONTRACTOR** or of any Subcontractor, any Supplier, or of any other person or organization performing or furnishing any of the Work.

ARTICLE 10 -- CHANGES IN THE WORK

10.1. Without invalidating the Agreement and without notice to any surety, **OWNER** may, at any time or from time to time, order additions, deletions or revisions in the Work; these will be authorized by a Written Amendment, a Change Order, or a Work Directive Change. 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).

10.2. If **OWNER** and **CONTRACTOR** are unable to agree as to the extent, if any, of an increase or decrease in the Contract Price or an extension or shortening of the Contract Time that should be allowed as a result of a Work Directive Change, a claim may be made therefore as provided in Article 11 or 12.

10.3. **CONTRACTOR** shall not be entitled to an increase in the Contract Price or an extension of the Contract Time with

respect to any Work performed that is not required by the Contract Documents as amended, modified and supplemented as provided in paragraphs 3.4 and 3.5, except in the case of an emergency as provided in paragraph 6.22 and except in the case of uncovering Work as provided in paragraph 13.9.

10.4. **OWNER** and **CONTRACTOR** shall execute appropriate Change Orders (or Written Amendments) covering:

10.4.1. changes in the Work which are ordered by **OWNER** pursuant to paragraph 10.1, are required because of acceptance of defective Work under paragraph 13.13 or correcting defective Work under paragraph 13.14, or are agreed to by the parties;

10.4.2. changes to the Contract Price or Contract Time which are agreed to by the parties; and

10.4.3. changes in the Contract Price or Contract Time which embody the substance of any written decision rendered by **ENGINEER** pursuant to paragraph 9.11; 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 6.29.

10.5. If notice 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 Time) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be **CONTRACTOR**'s responsibility, and the amount of each applicable Bond will be adjusted accordingly.

ARTICLE 11 -- CHANGE OF CONTRACT PRICE

11.1. The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to **CONTRACTOR** for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by **CONTRACTOR** shall be at his expense without change in the Contract Price.

11.2. The Contract Price may only be changed by a Change Order or a Written Amendment. Any claim for an increase or decrease in the Contract Price shall be based on written notice delivered by the party making the claim to the other party and to **ENGINEER** promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within sixty days after such occurrence (unless **ENGINEER** allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by claimant's written statement that the amount claimed covers all known amounts (direct, indirect and consequential) to which the claimant is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Price shall be determined by **ENGINEER** in accordance with paragraph 9.11 if **OWNER** and **CONTRACTOR** cannot otherwise agree on

the amount involved. No claim for an adjustment in the Contract Price will be valid if not submitted in accordance with this paragraph 11.2.

11.3. The value of any Work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:

11.3.1. Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved (subject to the provisions of paragraphs 11.9.1. through 11.9.3, inclusive),

11.3.2. By mutual acceptance of a lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 11.6.2.1).

11.3.3. On the basis of the Cost of the Work (determined as provided in paragraph 11.4 and 11.5) plus a **CONTRACTOR**'s Fee for overhead and profit (determined as provided in paragraphs 11.6 and 11.7).

Cost of the Work:

11.4. The term Cost of the Work means the sum of all costs necessarily incurred and paid by **CONTRACTOR** in the proper performance of the Work. 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 include only the following items and shall not include any of the costs itemized in paragraph 11.5:

11.4.1. 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**. 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' or workmen's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. Such employees shall include superintendents and foremen at the site. The expenses of performing Work after regular working hours, on Saturday, Sunday or legal holidays, shall be included in the above to the extent authorized by **OWNER**.

11.4.2. 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 discount shall accrue to **OWNER**. All trade discounts, rebates and refunds and all returns from sale of surplus materials and equipment shall accrue to **OWNER**, and **CONTRACTOR** shall make provisions so that they may be obtained.

11.4.3. Payments made by **CONTRACTOR** to the Subcontractors for Work performed by Subcontractors. If required by **OWNER**, **CONTRACTOR** shall obtain competitive bids from Subcontractors acceptable to

CONTRACTOR and shall deliver such bids to **OWNER** who will then determine, with the advice of **ENGINEER**, which bids will be accepted. If a 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 shall be determined in the same manner as **CONTRACTOR**'s Cost of the Work. All subcontractors shall be subject to the other provisions of the Contract Documents insofar as applicable.

11.4.4. 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.

11.4.5. Supplemental costs including the following:

11.4.5.1. The proportion of necessary transportation, travel and subsistence expenses of **CONTRACTOR**'s employees incurred in discharge of duties connected with the Work.

11.4.5.2. 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**.

11.4.5.3. 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, installation, dismantling and removal thereof—all in accordance with 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.

11.4.5.4. Sales, consumer, use or similar taxes related to the Work, and for which **CONTRACTOR** is liable, imposed by Laws and Regulations.

11.4.5.5. 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.

11.4.5.6. Losses and damages (and related expenses), not compensated by insurance or otherwise, to the Work or otherwise sustained by **CONTRACTOR** in connection with the performance and furnishing of the Work (except losses and damages within the deductible amounts of property insurance established by **OWNER** in accordance with paragraph 5.9), provided they 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. If, however, any such loss or damage requires

reconstruction and **CONTRACTOR** is placed in charge thereof, **CONTRACTOR** shall be paid for services a fee proportionate to that stated in paragraph 11.6.2.

11.4.5.7. The cost of utilities, fuel and sanitary facilities at the site.

11.4.5.8. Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.

11.4.5.9. Cost of premiums for additional Bonds and insurance required because of changes in the Work and premiums for property insurance coverage within the limits of the deductible amounts established by **OWNER** in accordance with paragraph 5.9.

11.5. The term Cost of the Work shall not include any of the following:

11.5.1. Payroll costs and other compensation of **CONTRACTOR**'s officers, executives, principals (of partnership and sole proprietorships), general 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 a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 11.4.1 or specifically covered in paragraph 11.4.4 -- all of which are to be considered administrative costs covered by the **CONTRACTOR**'s Fee.

11.5.2. Expenses of **CONTRACTOR**'s principal and branch offices other than **CONTRACTOR**'s office at the site.

11.5.3. Any part of **CONTRACTOR**'s capital expenses, including interest on **CONTRACTOR**'s capital employed for the Work and charges against **CONTRACTOR** for delinquent payments.

11.5.4. Cost of premiums for all Bonds and for all insurance whether or not **CONTRACTOR** is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by subparagraph 11.4.5.9 above).

11.5.5. Cost 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.

11.5.6. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 11.4.

CONTRACTOR's Fee:

11.6. The **CONTRACTOR**'s Fee allowed to **CONTRACTOR** for overhead and profit shall be determined as follows:

11.6.1. a mutually acceptable fixed fee; or if none can be agreed upon,

11.6.2. a fee based on the following percentages of the various portions of the Cost of the Work:

11.6.2.1. for costs incurred under paragraphs 11.4.1 and 11.4.2, the **CONTRACTOR**'s Fee shall be fifteen percent;

11.6.2.2. for costs incurred under paragraph 11.4.3, the **CONTRACTOR**'s Fee shall be five percent; and if a subcontract is on the basis of Cost of the Work Plus a Fee, the maximum allowable to **CONTRACTOR** on account of overhead and profit of all Subcontractors shall be fifteen percent;

11.6.2.3. no fee shall be payable on the basis of costs itemized under paragraphs 11.4.4, 11.4.5 and 11.5;

11.6.2.4. the amount of credit to be allowed by **CONTRACTOR** to **OWNER** for any such change which results in a net decrease in cost will be the amount of the actual net decrease plus a deduction in **CONTRACTOR**'s Fee by an amount equal to ten percent of the net decrease; and

11.6.2.5. when both additions and credits are involved in any one change, the adjustment in **CONTRACTOR**'s Fee shall be computed on the basis of the net change in accordance with paragraphs 11.6.2.1 through 11.6.2.4, inclusive.

11.7. Whenever the cost of any Work is to be determined pursuant to paragraph 11.4 or 11.5, **CONTRACTOR** will submit in form acceptable to **ENGINEER** an itemized cost breakdown together with supporting data.

Cash Allowances:

11.8. 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 done by such Subcontractors or Suppliers and for such sums within the limit of the allowances as may be acceptable to **ENGINEER**. **CONTRACTOR** agrees that:

11.8.1. The 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

11.8.2. **CONTRACTOR**'s costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances. No demand for additional payment on account of any thereof will be valid.

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.

Unit Price Work:

11.9.1. 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 established unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. 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** in accordance with Paragraph 9.10.

11.9.2. 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.

11.9.3. Where 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 there is no corresponding adjustment with respect to any other item of Work and if **CONTRACTOR** believes that **CONTRACTOR** has incurred additional expense as a result thereof, **CONTRACTOR** may make a claim for an increase in the Contract Price in accordance with Article 11 if the parties are unable to agree as to the amount of any such increase.

ARTICLE 12 -- CHANGE OF CONTRACT TIME

12.1. The Contract Time may only be changed by a Change Order or a Written Amendment. Any claim for an extension or shortening of the Contract Time shall be based on written notice delivered by the party making the claim to the other party and to **ENGINEER** promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within sixty days after such occurrence (unless **ENGINEER** allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Time shall be determined by **ENGINEER** in accordance with paragraph 9.11 if **OWNER** and **CONTRACTOR** cannot otherwise agree. No claim for an adjustment in the Contract Time will be valid if not submitted in accordance with the requirements of this paragraph 12.1.

12.2. The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of **CONTRACTOR** if a claim is made therefore as provided in paragraph 12.1. Such delays shall include, but not be limited to, acts or neglect by **OWNER** or others performing additional work as contemplated by Article 7, or to fires, floods, labor disputes, epidemics, abnormal weather conditions or acts of God.

12.3. All time limits stated in the Contract Documents are of the essence of the Agreement. The provisions of this Article 12 shall not exclude recovery for damages (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) for delay by either party.

ARTICLE 13- WARRANTY AND GUARANTEE; TEST AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

Warranty and Guarantee:

13.1 **CONTRACTOR** warrants and guarantees to **OWNER** and **ENGINEER** that all Work will be in accordance with the Contract Documents and will not be defective. Prompt notice of all defects shall be given to **CONTRACTOR**. All defective Work, whether or not in place, may be rejected, corrected or accepted as provided in this Article 13.

Access to Work:

13.2. **ENGINEER** and **ENGINEER**'s representatives, other representatives of **OWNER**, testing agencies and governmental agencies with jurisdictional interests will have access to the Work at reasonable times for their observation, inspecting and testing. **CONTRACTOR** shall provide proper and safe conditions for such access.

Tests and Inspections:

13.3. **CONTRACTOR** shall give **ENGINEER** timely notice of readiness of the Work for all required inspections, tests or approvals.

13.4. If Laws and Regulations of any public body having jurisdiction require any Work (or part thereof) to specifically be inspected, tested or approved. **CONTRACTOR** shall assume full responsibility therefore, pay all costs in connection therewith and furnish **ENGINEER** the required certificates of inspection, testing or approval. **CONTRACTOR** shall also be responsible for and shall pay all costs in connection with any inspection or testing required in connection with **OWNER**'s or **ENGINEER**'s acceptance of a Supplier of materials or equipment proposed to be incorporated in the Work, or of materials or equipment submitted for approval prior to **CONTRACTOR**'s purchase thereof for incorporation in the Work. The cost of all inspections, tests and approvals in addition to the above, which are required by the Contract Documents, shall be paid by **OWNER** (unless otherwise specified).

13.5. All inspections, test or approvals other than those required by Laws or Regulations of any public body having jurisdiction shall be performed by organizations acceptable to **OWNER** and **CONTRACTOR** (or by **ENGINEER** if so specified).

13.6. If any Work (including the work of others) that is to be inspected, tested or approved is covered without written

concurrence of **ENGINEER**, it must, if requested by **ENGINEER**, be uncovered for observation. Such uncovering 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.

13.7. Neither observations by **ENGINEER** nor inspections, tests or approvals by others shall relieve **CONTRACTOR** from **CONTRACTOR**'s obligations to perform the Work in accordance with the Contract Documents.

Uncovering Work:

13.8 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.

13.9. 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. If it is found that such Work is defective, **CONTRACTOR** shall bear all direct, indirect and consequential costs of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction, (including but not limited to fees and charges of engineers, architects, attorneys, and other professionals), and **OWNER** shall be entitled to an appropriate decrease in the Contract Price, and, if the parties are unable to agree as to the amount thereof, may make a claim therefore as provided in Article 11. If, however, such Work is not found to be defective, **CONTRACTOR** shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction; and, if the parties are unable to agree as to the amount or extent thereof, **CONTRACTOR** may make a claim therefore as provided in Articles 11 and 12.

Owner May Stop the Work:

13.10 If the Work is defective, or **CONTRACTOR** fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or 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 of 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** or any other party.

Correction or Removal of Defective Work:

13.11 If required by **ENGINEER**, **CONTRACTOR** shall promptly, as directed, either correct all defective Work, whether or not fabricated, installed or completed, or, if the Work has

been rejected by **ENGINEER**, remove it from the site and replace it with nondefective Work. **CONTRACTOR** shall bear all direct, indirect and consequential costs of such correction or removal (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) made necessary thereby.

One Year Correction Period:

13.12 If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or 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, **CONTRACTOR** shall promptly, without cost to **OWNER** and in accordance with **OWNER**'s written instructions, either correct such defective Work, or, if it has been rejected by **OWNER**, remove it from the site and replace it with nondefective Work. If **CONTRACTOR** does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, **OWNER** may have the defective Work corrected or the rejected Work removed and replaced, and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) will be paid by **CONTRACTOR**. 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 or by Written Amendment.

Acceptance of Defective Work:

13.13 If, instead of requiring correction or removal and replacement of defective Work, **OWNER** (and, prior to **ENGINEER**'s recommendation of final payment, also **ENGINEER**) prefers to accept it, **OWNER** may do so. **CONTRACTOR** shall bear all direct, indirect and consequential 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 to include but not be limited to fees and charges of engineers, architects, attorneys and other professionals). 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, and, if the parties are unable to agree as to the amount thereof, **OWNER** may make a claim therefore as provided in Article 11. If the acceptance occurs after such recommendation, an appropriate amount will be paid by **CONTRACTOR** to **OWNER**.

OWNER May Correct Defective Work:

13.14 If **CONTRACTOR** fails within a reasonable time after written notice of **ENGINEER** to proceed to correct and to correct defective Work or to remove and replace rejected Work as required by **ENGINEER** in accordance with paragraph 13.11, 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 and remedy any such deficiency. In exercising the rights and remedies under this paragraph **OWNER** shall proceed expeditiously. To the extent necessary to complete corrective and 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 such access to the site as may be necessary to enable **OWNER** to exercise the rights and remedies under this paragraph. All direct, indirect and consequential costs of **OWNER** in exercising such rights and remedies will be charged against **CONTRACTOR** in an amount approved as to reasonableness by **ENGINEER**, 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, and, if the parties are unable to agree as to the amount thereof, **OWNER** may make a claim therefore as provided in Article 11. Such direct, indirect and consequential costs will include but not be limited to fees and charges of engineers, architects, attorneys and other professionals, all court and arbitration costs and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of **CONTRACTOR**'s defective Work. **CONTRACTOR** shall not be allowed an extension of the Contract Time because of any delay in performance of the Work attributable to the exercise by **OWNER** of **OWNER**'s rights and remedies hereunder.

ARTICLE 14- PAYMENTS TO CONTRACTOR AND COMPLETION

Schedule of Values:

14.1. The schedule of values established as provided in paragraph 2.9 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.

Application for Progress Payment:

14.2. At least twenty days before each progress payment is scheduled (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, charges, security interests and encumbrances (which are hereinafter in these General Conditions referred to as "Liens") and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect **OWNER**'s interest therein, all of which will be satisfactory to **OWNER**. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

CONTRACTOR's Warranty of Title:

14.3. **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.

Review of Applications for Progress Payment:

14.4. **ENGINEER** will, within ten 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. Ten days after presentation of the Application for Payment with **ENGINEER**'s recommendation, the amount recommended will (subject to the provisions of the last sentence of paragraph 14.7) become due and when due will be paid by **OWNER** to **CONTRACTOR**.

14.5. **ENGINEER**'s recommendation of any payment requested in an Application for Payment will constitute a representation by **ENGINEER** to **OWNER**, based on **ENGINEER**'s on-site observations of the Work in progress as an experienced and qualified design professional and on **ENGINEER**'s review of the Application for Payment and the accompanying data and schedules that the Work has progressed to the point indicated; that, to the best of **ENGINEER**'s knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under paragraph 9.10, and to any other qualifications stated in the recommendation); and that **CONTRACTOR** is entitled to payment of the amount recommended. However, by recommending any such payment **ENGINEER** will not thereby be deemed to have represented that exhaustive or continuous on-site inspections have been made to check the quality or the quantity of the Work beyond the responsibilities specifically assigned to **ENGINEER** in the Contract Documents or that there may not be other matters or issues between the parties that might entitle **CONTRACTOR** to be paid additionally by **OWNER** or **OWNER** to withhold payment to **CONTRACTOR**.

14.6. **ENGINEER**'s recommendation of final payment will constitute an additional representation by **ENGINEER** to **OWNER** that the conditions precedent to **CONTRACTOR**'s being entitled to final payment as set forth in paragraph 14.13 have been fulfilled.

14.7. **ENGINEER** may refuse to recommend the whole or any part of any payment if, in **ENGINEER**'s opinion, it would be incorrect to make such representations to **OWNER**. **ENGINEER** may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in **ENGINEER**'s opinion to protect **OWNER** from loss because:

14.7.1. the Work is defective, or completed Work has been damaged requiring correction or replacement;

14.7.2. the Contract Price has been reduced by Written Amendment or Change Order;

14.7.3. **OWNER** has been required to correct defective Work or complete Work in accordance with paragraph 13.14, or

14.7.4. of **ENGINEER**'s actual knowledge of the occurrence of any of the events enumerated in paragraphs 15.2.1 through 15.2.9 inclusive.

OWNER may refuse to make payment of the full amount recommended by **ENGINEER** because claims have been made against **OWNER** on account of **CONTRACTOR**'s performance or furnishing of the Work or Liens have been filed in connection with the Work or there are other items entitling **OWNER** to a set-off against the amount recommended, but **OWNER** must give **CONTRACTOR** immediate written notice (with copy to **ENGINEER**) stating the reasons for such action.

Substantial Completion:

14.8 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 **ENGINEER** does not consider the Work substantially complete, **ENGINEER** will notify **CONTRACTOR** in writing giving the reasons therefore. If **ENGINEER** considers the Work substantially complete, **ENGINEER** will prepare and 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 fourteen days after submission of the tentative certificate to **OWNER** notify **CONTRACTOR** in writing, stating the reasons therefore. If, after consideration of **OWNER**'s objections, **ENGINEER** considers the Work substantially complete, **ENGINEER** will within said fourteen 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**. 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, maintenance, heat, utilities, insurance and warranties. Unless **OWNER** and **CONTRACTOR** agree otherwise in writing and so inform **ENGINEER** 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.

14.9. **OWNER** shall have the right to exclude **CONTRACTOR** from the Work after the date of Substantial Completion, but **OWNER** shall allow **CONTRACTOR** reasonable access to complete or correct items on the tentative list.

Partial Utilization:

14.10 Use by **OWNER** of any finished part of the Work, which has specifically been identified in the Contract Document, or which **OWNER**, **ENGINEER** and **CONTRACTOR** agree constitutes a separately functioning and useable part of the Work that can be used by **OWNER** without significant interference with **CONTRACTOR**'s performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following:

14.10.1 **OWNER** at any time may request **CONTRACTOR** in writing to permit **OWNER** to use any such part of the Work which **OWNER** believes to be ready for its intended use and substantially complete. If **CONTRACTOR** agrees, **CONTRACTOR** will certify to **OWNER** and **ENGINEER** that said part of the Work is substantially complete and request **ENGINEER** to issue a certificate of Substantial Completion for that part of the Work. **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. 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 therefore. If **ENGINEER** considers that part of the Work to be substantially complete, the provisions of paragraphs 14.8 and 14.9 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.

14.10.2 **OWNER** may at any time request **CONTRACTOR** in writing to permit **OWNER** to take over operation of any such 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 list 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.

14.10.3 No occupancy or separate operation of part of the Work will be accomplished prior to compliance with the requirements of paragraph 5.15 in respect of property insurance.

Final Inspection:

14.11 Upon written notice from **CONTRACTOR** that the entire Work or an agreed portion thereof is complete, **ENGINEER** will 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 remedy such deficiencies.

Final Application for Payment:

14.12 After **CONTRACTOR** has completed all such corrections to the satisfaction of **ENGINEER** and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, marked-up record documents (as provided in paragraph 6.19) and other documents—all as required by the Contract Documents, and after **ENGINEER** has indicated that the Work is acceptable (subject to the provisions of paragraph 14.16), **CONTRACTOR** may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, together with complete and legally effective releases or waivers (satisfactory to **OWNER**) of all Liens arising out of or filed in connection with the Work. In lieu thereof and as approved by **OWNER**, **CONTRACTOR** may furnish receipts or releases in full; an affidavit of **CONTRACTOR** that the releases and receipts include all labor, services, material and equipment for which a Lien could be filed, and that all payrolls, material and equipment bills, and other indebtedness connected with the Work for which **OWNER** or **OWNER**'s property might in any way be responsible, have been paid or otherwise satisfied; and consent of the surety, if any, to final payment. If any Subcontractor or

Suppliers fails to furnish a release or receipt in full, **CONTRACTOR** may furnish a Bond or other collateral satisfactory to **OWNER** to indemnify **OWNER** against any Lien.

Final Payment and Acceptance:

14.13 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, within ten days after receipt of the final Application for Payment, indicate in writing **ENGINEER**'s 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 14.16. 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. Thirty days after presentation to **OWNER** of the Application and accompanying documentation, in appropriate form and substance, and with **ENGINEER**'s recommendation and notice of acceptability, the amount recommended by **ENGINEER** will become due and will be paid by **OWNER** to **CONTRACTOR**.

14.14 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 and recommendation of **ENGINEER**, and without terminating the Agreement, 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 5.1, 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.

Contractor's Continuing Obligation:

14.15 **CONTRACTOR**'s obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by **ENGINEER**, nor the issuance of a certificate of Substantial Completion, nor any payment by **OWNER** to **CONTRACTOR** under the Contract Documents, nor any use or occupancy of the Work or any part thereof by **OWNER**, nor any act of acceptance by **OWNER** nor any failure to do so, nor any review and approval of a Shop Drawing or sample submission, nor the issuance of a notice of acceptability by **ENGINEER** pursuant to paragraph 14.13, nor any correction of defective Work by **OWNER** will constitute an acceptance of Work not in accordance with the Contract Documents or a

release of **CONTRACTOR**'s obligation to perform the Work in accordance with the Contract Documents (except as provided in paragraph 14.16).

Waiver of Claims:

14.16 The making and acceptance of final payment will constitute:

14.16.1 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 14.11 or from failure to comply with the Contract Documents or the terms of any special guarantees specified therein; however, it will not constitute a waiver by **OWNER** of any rights in respect of **CONTRACTOR**'s continuing obligations under the Contract Documents; and

14.16.2 a waiver of all claims by **CONTRACTOR** against **OWNER** other than those previously made in writing and still unsettled.

ARTICLE 15— SUSPENSION OF WORK AND TERMINATION

Owner May Suspend Work:

15.1. **OWNER** may, at any time and without cause, suspend the Work or any portion thereof for a period of not more than ninety 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 allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if **CONTRACTOR** makes an approved claim therefore as provided in Articles 11 and 12.

Owner May Terminate:

15.2. Upon the occurrence of any one or more of the following events:

15.2.1. if **CONTRACTOR** commences a voluntary case under any chapter of the Bankruptcy Code (Title 11, United States Code), as now or hereafter in effect, or if **CONTRACTOR** takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such time relating to the bankruptcy or insolvency;

15.2.2. if a petition is filed against **CONTRACTOR** under any chapter of the Bankruptcy Code as now or hereafter in effect at the time of filing, or if a petition is filed seeking any such equivalent or similar relief against **CONTRACTOR** under any other federal or state law in effect at the time relating to bankruptcy or insolvency;

15.2.3. if **CONTRACTOR** makes a general assignment for the benefit of creditors;

15.2.4. if a trustee, receiver, custodian or agent of **CONTRACTOR** is appointed under applicable law or under

contract, whose appointment or authority to take charge of property of **CONTRACTOR** is for the purpose of enforcing a Lien against such property or for the purpose of general administration of such property for the benefit of **CONTRACTOR**'s creditors;

15.2.5. if **CONTRACTOR** admits in writing an inability to pay its debts generally as they become due;

15.2.6. if **CONTRACTOR** persistently fails 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 2.9 as revised from time to time);

15.2.7. if **CONTRACTOR** disregards Laws or Regulations of any public body having jurisdiction;

15.2.8. if **CONTRACTOR** disregards the authority of **ENGINEER**; or

15.2.9. if **CONTRACTOR** otherwise violates in any substantial way any provisions of the Contract Documents;

OWNER may, after giving **CONTRACTOR** (and the surety, if there be one) seven days' written notice and to the extent permitted by Laws and Regulations, terminate the services of **CONTRACTOR**, 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), 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 finish the Work as **OWNER** may deem expedient. In such case **CONTRACTOR** shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct, indirect and consequential costs of completing the Work (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) such excess will be paid to **CONTRACTOR**. If such costs exceed such unpaid balance, **CONTRACTOR** shall pay the difference to **OWNER**. Such costs incurred by **OWNER** will be approved as to reasonableness by **ENGINEER** and incorporated in a Change Order, but when exercising any rights or remedies under this paragraph **OWNER** shall not be required to obtain the lowest price for the Work performed.

15.3. 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.

15.4. Upon seven days' written notice to **CONTRACTOR** and **ENGINEER**, **OWNER** may, without cause and without prejudice to any other right or remedy, elect to abandon the Work and terminate the Agreement. In such case,

CONTRACTOR shall be paid for all Work executed and any expenses sustained plus reasonable termination expenses, which will include, but not be limited to, direct, indirect and consequential costs (including, but not limited to, fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs).

Contractor May Stop Work or Terminate:

16.5. If, through no act or fault of **CONTRACTOR**, the Work is suspended for a period of more than ninety days by **OWNER** or under an order of court or other public authority, or **ENGINEER** fails to act on any Application for Payment within thirty days after it is submitted, or **OWNER** fails for thirty days to pay **CONTRACTOR** any sum finally determined to be due, then **CONTRACTOR** may, upon seven days' written notice to **OWNER** and **ENGINEER**, terminate the Agreement and recover from **OWNER** payment for all Work executed and any expense sustained plus reasonable termination expenses. In addition and in lieu of terminating the Agreement, if **ENGINEER** has failed to act on an Application for Payment or **OWNER** has failed to make any payment as aforesaid, **CONTRACTOR** may, upon seven days' written notice to **OWNER** and **ENGINEER** stop the Work until payment of all amounts then due. The provisions of this paragraph shall not relieve **CONTRACTOR** of the obligations under paragraph 6.29 to carry on the Work in accordance with the progress schedule and without delay during disputes and disagreements with **OWNER**.

ARTICLE 16—ARBITRATION

16.1. All claims, disputes and other matters in question between **OWNER** and **CONTRACTOR** arising out of, or relating to the Contract Documents or the breach thereof (except for claims which have been waived by the making or acceptance of final payment as provided by paragraph 14.16) will be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association then obtaining subject to the limitations of this Article 16. This agreement so to arbitrate and any other agreement or consent to arbitrate entered into in accordance herewith as provided in this Article 16 will be specifically enforceable under the prevailing law of any court having jurisdiction.

16.2. No demand for arbitration of any claim, dispute or other matter that is required to be referred to **ENGINEER** initially for decision in accordance with paragraph 9.11 will be made until the earlier of (a) the date on which **ENGINEER** has rendered a decision or (b) the tenth day after the parties have presented their evidence to **ENGINEER** if a written decision has not been rendered by **ENGINEER** before that date. No demand for arbitration of any such claim, dispute or other matter will be made later than thirty days after the date on which **ENGINEER** has rendered a written decision in respect thereof in accordance with paragraph 9.11; and the failure to demand arbitration within said thirty days' period shall result in **ENGINEER**'s decision being final and binding upon **OWNER** and **CONTRACTOR**. If **ENGINEER** renders a decision after arbitration proceedings have been initiated, such decision may

be entered as evidence but will not supersede the arbitration proceedings, except where the decision is acceptable to the parties concerned. No demand for arbitration of any written decision of **ENGINEER** rendered in accordance with paragraph 9.10 will be made later than ten days after the party making such demands has delivered written notice of intention to appeal as provided in paragraph 9.10.

16.3. Notice of the demand for arbitration will be filed in writing with the other party to the Agreement and with the American Arbitration Association, and a copy will be sent to **ENGINEER** for information. The demand for arbitration will be made within the thirty-day or ten-day period specified in paragraph 16.2 as applicable, and in all other cases within a reasonable time after the claim, dispute or other matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such claim, dispute or other matter in question would be barred by the applicable statute of limitations.

16.4. No arbitration arising out of or relating to the Contract Documents shall include by consolidation, joinder or in any other manner any other person or entity (including **ENGINEER**, **ENGINEER**'s agents, employees or consultants) who is not a party to this contract unless:

16.4.1. the inclusion of such other person or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration,

16.4.2. such other person or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings, and

16.4.3. the written consent of the other person or entity sought to be included and of **OWNER** and **CONTRACTOR** has been obtained for such inclusion, which consent shall make specific reference to this paragraph; but no such consent shall constitute consent to arbitration of any dispute not specifically described in such consent or to arbitration with any party not specifically identified in such consent.

16.5. The award rendered by the arbitrators will be final, judgement may be entered upon it in any court having jurisdiction thereof, and will not be subject to modification or appeal except to the extent permitted by Section 10 and 11 of the Federal Arbitration Act (9 U.S.C. 10.11).

ARTICLE 17—MISCELLANEOUS

Giving Notice:

17.1. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if 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 if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

Computation of Time:

17.2.1 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 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.

17.2.2 A calendar day of twenty-four hours measured from midnight to the next midnight shall constitute a day.

General:

17.3. Should **OWNER** or **CONTRACTOR** suffer injury or damage to person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim will be made in writing to the other party within a reasonable time of the first observance of such injury or damage. The provisions of this paragraph 17.3 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.

17.4. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitations, the warranties, guarantees and obligations imposed upon **CONTRACTOR** by paragraphs 6.30, 13.1, 13.12, 13.14, 14.3, and 15.2 and all of the rights and remedies available to **OWNER** and **ENGINEER** thereunder, 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 and 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. All representations, warranties and guarantees made in the Contract Documents will survive final payment and termination or completion of the Agreement.

SECTION 00820
SUPPLEMENTARY GENERAL CONDITIONS

<u>Article Number</u>	<u>Title</u>
SGC1	Definitions
SGC2	Preliminary Matters
SGC4	Availability of Lands; Physical Conditions; Reference Points
SGC5	Bonds and Insurance
SGC6	Contractor's Responsibilities
SGC9	Engineer's Status During Construction
SGC11	Change of Contract Price
SGC12	Change of Contract Time
SGC13	Contractor's Guaranty
SGC16	Arbitration
SGC18	Liquidated Damages

SECTION 00820

SUPPLEMENTARY GENERAL CONDITIONS

The General Conditions (Section 00700) are amended and supplemented as indicated below. All provisions not specifically amended shall remain in full force and effect.

ARTICLE SGC1 - DEFINITIONS

The terms used in these Supplementary General Conditions which are defined in Section 00700 - General Conditions - have the meanings assigned to them in the General Conditions unless defined, amended or supplemented below.

Insert the following definitions in Article 1 in the proper place in alphabetical order:

"AWARDING AUTHORITY - same definition as OWNER.

BIDDER - any person, firm or corporation submitting a BID for the work.

FINAL COMPLETION - the work has been fully completed and ready for its intended use as required by Contract Documents and to the satisfaction of ENGINEER and OWNER, and CONTRACTOR's other obligations under the Contract Documents have been fulfilled. If a tentative list of items to be completed or corrected was issued with a certificate by Substantial Completion or issued subsequent thereto, such items shall be completed or corrected before work is considered fully completed."

Add the following sentence to the definition of "WORK":

The CONTRACTOR shall work during regular work hours (7:30 AM to 4:00 PM Monday through Friday) excluding holidays as defined in the wage rate decision. Work at other times, including nights and weekends, shall be at the option of, and only with written approval of, the OWNER.

ARTICLE SGC2 - PRELIMINARY MATTERS

Add the following to the end of 2.5

"Should the work proceed, after the discovery of errors, conflict, or omissions by the ENGINEER and clarification has not been received from the ENGINEER, the CONTRACTOR will be held fully responsible for replacement or correction of the affected area, as directed by the ENGINEER, at the CONTRACTOR's expense.

2.5.1 CONTRACTOR's Review of the Site. The CONTRACTOR shall thoroughly acquaint himself with all the existing conditions at the site and shall take all such conditions into consideration as they may affect the work under his Contract. No allowance will be made in the Contract or the Work under the Contract for failure of the CONTRACTOR to visit the site.

2.5.2 Before ordering any material or doing any work, each trade shall verify all measurements at this project and shall be responsible for the correctness of the same. No extra charge or compensation will be allowed on account of difference between actual dimensions and the measurements indicated on the Drawings, any difference which may be found shall be submitted to the ENGINEER for consideration before proceeding with the work."

Add the following new paragraph 2.10:

"2.10 Contract Interpretation

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The General Conditions, Supplementary General Conditions and Special Conditions are complementary and shall be read together. Insofar as these Sections cannot be reconciled, the Special Conditions take precedence over all other conditions, and the Supplementary General Conditions take precedence over the General Conditions.

All other conflicts in the Contract Documents will be resolved by the ENGINEER in accordance with Paragraphs 9.11 and 9.12.

ARTICLE SGC3 – CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

Add the following to the end of 3.1

“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. All work mentioned or indicated in the Contract Documents shall be performed by the CONTRACTOR as part of the Contract unless it is specifically indicated in the Contract Documents that such Work is to be done by others.

3.1.1 In the event of conflict in or between the Contract Documents, the CONTRACTOR shall be held to the highest standard therein. Where compliance with two or more industry standards or set of requirements is specified, and overlapping of those different standards or requirements established different or conflicting minimums or level of quality, the most stringent requirements is intended.

3.1.2 In the event of a conflict between any provision or language of the Contract and any provision or language of the Contract Documents, the provision or language of the Contract shall control. In the event of any conflict or inconsistency between this Contract, the Contract Documents and any applicable state law, the applicable statutory provisions shall prevail.”

Add the following new 3.2.1 3.2.3

“3.2.1 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade, except sections designated for Filed Sub-Bids as otherwise required by law. The General CONTRACTOR and all Subcontractors shall refer to all of the Drawings, including those showing primarily the work of the mechanical, electrical, and other specialized trades, and to all of the sections of the specifications, and shall perform all Work reasonably inferable therefrom as being necessary to produce the indicated results.

3.2.2 The DRAWINGS and SPECIFICATIONS are intended to supplement one another. Materials and workmanship described are not necessarily found in both. Drawings are not intended to be scaled or to act as shop drawings. Inadvertent discrepancies or omissions shown on one drawing but not on others shall not be cause for additional charges or claims. In case of discrepancies, figured dimensions shall take precedence over smaller scale drawings. Specifications shall take precedence over Drawings for quality of materials and general performance of the work.

3.2.3 Whenever an item is specified and/or shown on the Drawings by details or reference, it shall be considered typical for other items which are obviously intended to be the same even though not so designated or specifically named but do serve the same function for this project.”

ARTICLE SGC4 - AVAILABILITY OF LANDS; PHYSICAL CONDITIONS, REFERENCE POINTS

There have been no reports of explorations and tests of subsurface conditions utilized by the ENGINEER in preparation of the Contract Documents. All existing structures and subsurface structures (except underground facilities referred to in Paragraph 4.3) identified by the ENGINEER were based on the best information available.

ARTICLE SGC5 - BONDS AND INSURANCE

Delete Paragraph 5.1 and substitute the following:

"The CONTRACTOR shall furnish a performance bond for the full amount of the Contract, and also a labor and materials payment bond for the full amount of the Contract, the form of which bonds are set forth in the Contract Documents, each of a surety company qualified to do business under state laws and satisfactory to the OWNER, the premiums for which are to be included in the Contract Price and paid by the CONTRACTOR. These bonds shall (a) guarantee the faithful performance by the CONTRACTOR of all its obligations under this contract and (b) constitute the security required by Massachusetts General Laws Chapter 149, Section 29 and Chapter 30, Section 39A, as amended, for payment by the CONTRACTOR or its subcontractors used or employed in connection with the contract. Each bond shall incorporate by reference the terms of this contract. These bonds shall remain in effect for the entire guarantee period for each phase of the work, which shall commence on the date of Substantial Completion, as defined in Paragraph 8.1.3. The Surety Company providing the bonds shall have a rating of A or better within the Best Key Rating Guide and be licensed by the Massachusetts Division of Insurance. The Contractor shall pay the premiums for such Bonds."

Add the following language at the beginning of Paragraph 5.3:

"The CONTRACTOR shall not commence work under this Contract until he has obtained all the insurance required hereunder and such insurance has been approved by the OWNER, nor shall the CONTRACTOR allow any Subcontractor to commence work on his subcontract until all similar insurance required of the Subcontractor has been so obtained and approved. Approval of the insurance by the OWNER shall not relieve or decrease the liability of the CONTRACTOR hereunder."

Add the following language at the end of Paragraph 5.3:

"Certificates from the insurance carrier together with copies of the policy shall be filed with the OWNER and shall state the type of coverage, limits of liability and the expiration date on each certificate.

Renewal certificates covering the renewal of all policies expiring during the Contract Time, shall be filed with the OWNER not less than 30 days prior to the expiration of such policies.

With respect to insurance identified in paragraphs 5.3.3, 5.3.4, 5.3.5 5.3.6, 5.16.1b., 5.16.1c., 5.16.1d, and 5.16.1e, such insurance shall name the **Maynard Department of Public Works, Town of Maynard, and Stantec Consulting Services Inc.** as additional named insured.

All the policies of insurance (or the certificates or other evidence thereof) required to be purchased and maintained by CONTRACTOR will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least thirty days' prior written notice has been given to OWNER by certified mail. The words "**Endeavor to**" shall be struck from the Certificate Of Insurance in the Cancellation Statement""

Delete Paragraphs 5.6 through 5.14

Add the following new paragraphs after Paragraph 5.15:

"Insurance Requirements:

5.16.1 Liability Insurance: The limits of liability for the liability insurance required by Paragraph 5.3 of the General Conditions shall provide coverages for not less than the following amounts or greater where required by law or regulations and the coverages under Paragraphs 5.4 and 5.5 shall be as follows:

a. Workers Compensation, etc. under Paragraphs 5.3.1 and 5.3.2. of the General Conditions:

State:	Statutory
Applicable Federal	Statutory
Employer's Liability:	<u>\$ 500,000</u> .

b. Comprehensive General Liability under Paragraphs 5.3.3 through 5.3.6. of the General Conditions (including Premises-Operations; Independent Contractor's Protection; Products Liability and Completed Operations; Broad Form Property Damage);

Bodily Injury (including completed operations and products liability):

\$1,000,000. Each Occurrence
\$3,000,000. Annual Aggregate
Property Damage:
\$1,000,000. Each Occurrence
\$3,000,000. Annual Aggregate

or a combined single limit of \$3,000,000.

Property Damage Liability Insurance will provide Explosion, Collapse and Underground coverages.

Personal Injury, with employment exclusion deleted

\$3,000,000. Annual Aggregate

c. Comprehensive Automobile Liability under Paragraph 5.3.7 of the General Conditions:

Bodily Injury:

\$1,000,000. Each Person
\$1,000,000. Each Occurrence

Property Damage:

\$1,000,000. Each Occurrence

or a combined single limit of \$3,000,000.

d. Contractual Liability under Paragraph 5.4 of the General Conditions:

Bodily Injury:

\$3,000,000 Each Occurrence

Property Damage:

\$1,000,000 Each Occurrence

\$3,000,000 Annual Aggregate

e. Umbrella or Excess Liability following the same form as the underlying General Liability, Automobile Liability and Employer's Liability policies:

\$2,000,000. Each Occurrence

\$2,000,000. Aggregate

ARTICLE SGC6 - CONTRACTOR'S RESPONSIBILITIES

Add the following new paragraphs:

"6.0 General/Review of Contract Documents and Field Conditions by Contractor

6.0.1 **CONTRACTOR's Financial Condition.** The CONTRACTOR represents and warrants that its financial condition is sound, and that the CONTRACTOR is capable of performing the work required pursuant to the Contract Documents. Upon request by the OWNER, the CONTRACTOR shall make available to the OWNER such audited and unaudited financial statements of the CONTRACTOR as the OWNER may reasonably request. The CONTRACTOR shall promptly advise the OWNER of any occurrence, event, fact, or other matter that has had, will have, or might reasonably be predicted to have a material adverse effect upon the financial condition of the CONTRACTOR.

6.0.2 Since the Contract Documents are complementary, before starting each portion of the Work, the CONTRACTOR shall carefully study and compare the various Drawings and other Contract Documents relative to that portion of the Work, as well as the information furnished by the OWNER, shall take field measurements of any existing conditions related to that portion of the Work and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating construction by the CONTRACTOR and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, any errors, inconsistencies or omissions discovered by the CONTRACTOR shall be reported promptly to the ENGINEER and OWNER, in writing, as a request for information. Before starting the work and at frequent intervals during the progress thereof, the CONTRACTOR shall carefully study and compare the contract documents with each other and with the information furnished by the OWNER and shall at once report to the ENGINEER any error, inconsistency or omission the CONTRACTOR may discover. Any necessary change will be ordered as provided in Article 10, subject to the requirements of Article 3 and other provisions of the Contract Documents. If the CONTRACTOR proceeds with the Work without such notice, the ENGINEER, having discovered such errors, inconsistencies or omissions, or if by reasonable study of the Contract Documents he could be discovered such, the CONTRACTOR shall bear all cost arising therefrom.

6.0.3 Any design errors or omissions noted by the CONTRACTOR during this review shall be reported promptly to the ENGINEER and OWNER, in writing, but it is recognized

that the CONTRACTOR's review is made in the CONTRACTOR's capacity as a contractor and not as a licensed design professional unless otherwise specifically provided in the Contract Documents. The CONTRACTOR is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations, but any nonconformity discovered by or made known to the CONTRACTOR shall be reported promptly to the ENGINEER and OWNER, in writing.

6.0.4 If the CONTRACTOR believes that additional cost or time is involved because of clarifications or instructions issued by the ENGINEER in response to the CONTRACTOR's notices or requests for information pursuant to Sections 6.0.2 and 6.0.3, the CONTRACTOR shall make Claims as provided in Section 10.5. If the CONTRACTOR fails to perform the obligations of Sections 6.0.2 and 6.0.3, the CONTRACTOR shall pay such costs and damages to the OWNER as would have been avoided if the CONTRACTOR had performed such obligations.

6.0.5 The CONTRACTOR shall reimburse the OWNER for costs incurred by the ENGINEER and the OWNER for design and construction administration services which are caused by the CONTRACTOR's inefficient or otherwise faulty administration or execution of its Work. These may include but are not limited to the cost of the ENGINEER or OWNER to perform:

- .1 Repeated review of the CONTRACTOR's resubmittals, substantially out of sequence from the submittal schedule provided by the CONTRACTOR and agreed to by the ENGINEER.
- .2 An extensive number of responses to the CONTRACTOR's requests for information where such information is available to the CONTRACTOR from a careful study and comparison of the Contract Documents, field conditions, other OWNER-provided information, CONTRACTOR-prepared coordination drawings, or prior Project correspondence or documentation.
- .3 An extensive number of Change Orders and Work Change Directives requiring evaluation of proposals and the preparation or revision of Instruments of Service and not otherwise caused by the design defects of the ENGINEER.
- .4 Consultation regarding replacement of Work resulting from fire or other cause during construction.
- .5 Evaluation of an extensive number of claims not otherwise caused by design defect.
- .6 Evaluation of substitutions proposed by the CONTRACTOR and making subsequent revisions to Instruments of Services resulting therefrom.
- .7 Preparation of design and documentation for alternate bid or proposal requests proposed by the CONTRACTOR.
- .8 Contract administration services provided sixty (60) days or more after Substantial Completion.

6.0.6 *Preconstruction inspection.* The CONTRACTOR shall notify the OWNER, OWNER's PROJECT MANAGER and ENGINEER in writing of any existing damage to the property or any unsafe conditions at the site prior to commencing the Work.

6.0.7 The CONTRACTOR shall give the ENGINEER timely notice of any additional design drawings, specifications or instructions required to define the Work in greater detail, or to permit the proper progress of the Work.

6.0.8 The CONTRACTOR shall not proceed with any work not clearly and consistently defined in detail in the Contract Documents, but shall request additional drawings or instructions from the ENGINEER as provided in Subparagraph 6.0.4. If the General CONTRACTOR proceeds with such work without obtaining further drawings or instructions, he shall correct work incorrectly done at his own expense.

Delete the following from paragraph 6.1:

“but 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.”

Add the following to the end of paragraph 6.1:

“If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the CONTRACTOR shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for jobsite safety of such means, methods, techniques, sequences or procedures. If the CONTRACTOR determines that such means, methods, techniques, sequences or procedures may not be safe, the CONTRACTOR shall give timely written notice to the OWNER and the ENGINEER. All loss, damage, or liability, or cost of correcting defective work arising from the employment of any construction means, methods, techniques, sequences or procedures shall be born by the CONTRACTOR notwithstanding that such construction means, methods, techniques, sequences or procedures are referred to, indicated or implied by the Contract Documents, unless the CONTRACTOR has given timely notice to the OWNER and the ENGINEER in writing that such means, methods, techniques, sequences or procedures are not safe or suitable, and the OWNER has then instructed the CONTRACTOR in writing to proceed at the OWNER’s risk.”

Delete paragraph 6.2 and replace with the following:

“At the site of the Work the CONTRACTOR shall employ a full-time construction superintendent or foreman who shall have full authority to act for the CONTRACTOR. It is understood that such representative shall be acceptable to the ENGINEER and shall be one who will be continued in the capacity for the particular job involved unless the representative ceases to be on the CONTRACTOR’s payroll. If at any time during the Work the representative is deemed by the ENGINEER to be no longer acceptable, the representative shall be promptly replaced by the CONTRACTOR. All communications to the superintendent shall be as binding as if given to the CONTRACTOR.”

Add the following to the end of paragraph 6.3:

“The CONTRACTOR shall be responsible to the OWNER for acts and omissions of all entities or persons performing or supplying the Work.

6.3.1 The CONTRACTOR shall employ workers competent to perform the work required by the contract and, upon written request of the OWNER, remove and replace workers whom the OWNER deems to be disorderly, careless or incompetent, or to be employed in violation of the terms of the Contract Documents, at no increase in the Contract Price or the Contract Time.

6.3.2 The CONTRACTOR shall neither permit nor suffer smoking where it creates a hazard, nor the introduction or use of spirituous or intoxicating liquors upon or about the works embraced in this Contract or upon any of the ground occupied by him.”

Add the following new paragraphs:

“6.4.1 *Weather Protection and Adequate Heat.* The CONTRACTOR shall install weather protection and furnish adequate heat in the protected area from November 1 to March 31 as required by General Laws, Chapter 149, Section 44F.

6.4.2 *Sanitary Facilities.* The CONTRACTOR shall provide and maintain in a neat and sanitary condition such accommodations for the use of his employees as may be necessary to comply with the requirements of the appropriate authorities. The maintenance of all sanitary facilities shall be subject to the laws of the Commonwealth

and to the rules and regulations of the State Board of Health and the Board of Health for the Town."

Add the following new paragraph 6.5.1:

"6.5.1 The CONTRACTOR shall be solely responsible for determining that all materials furnished for the work meet all of the requirements of the Contract Documents. The ENGINEER may require the CONTRACTOR to produce reasonable evidence that a material meets such requirements, such as certified reports of past tests by qualified testing laboratories, reports of studies by qualified experts, or other evidence which, in the opinion of the ENGINEER, would lead to a reasonable certainty that any material used or proposed to be used, and the work meets the requirements of the Contract Documents all such data shall be furnished at the CONTRACTOR's expense. This provision shall not require the CONTRACTOR to pay for periodic testing of different batches of the same material, unless such testing is specifically required by the Contract Documents to be performed at the CONTRACTOR's expense."

Add the following to the beginning of 6.6:

"Time limits stated in the Contract Documents are of the essence. The CONTRACTOR and its Subcontractors shall perform and coordinate all Work without delay. By executing the Agreement the CONTRACTOR confirms that the CONTRACT TIME is a reasonable period for performing the WORK."

Add the following paragraph to paragraph 6.7.1:

"Wherever it may be written that an equipment manufacturer must have a specified period of experience with his product, equipment which does not meet the specified experience period can be considered if the equipment supplier or manufacturer is willing to provide a bond or cash deposit for the duration of the specified time period which will guarantee replacement of that equipment in the event of failure."

Add the following sentence to the end of paragraph 6.10:

"Except as required otherwise by Massachusetts General Law Chapter 149, Section 44F, for Work governed by Chapter 149, sections 44A through 44H."

Add the following sentence to paragraph 6.11:

"The CONTRACTOR shall submit one copy of each of his subcontracts to the ENGINEER demonstrating compliance with this and related requirements."

Add the following new paragraphs 6.14.3 – 6.14.5:

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

based on any violation, whether by the CONTRACTOR or its officials, employees or subcontractors, of any such law.

6.14.4 The CONTRACTOR shall comply with all applicable provisions Chapter 30, Section 39R of the Massachusetts General Laws regarding, CONTRACTOR's records.

6.14.5 Compliance with Tax Laws. By executing the Contract Documents, the CONTRACTOR certifies under the pains and penalties of perjury pursuant to Chapter 62C, Section 49A(b) of the Massachusetts General Laws that the CONTRACTOR has complied with all of the laws of the Commonwealth of Massachusetts relating to taxes."

Delete paragraph 6.15 and substitute the following therefor:

6.15 The OWNER is exempt from payment of certain Sales and Use taxes applicable in the Commonwealth of Massachusetts. At the CONTRACTOR's request, Tax Exemption Certificates will be furnished by the OWNER to the CONTRACTOR with respect to such tax exempt articles as may be required under this Contract. The CONTRACTOR shall not pay, and the Town shall not reimburse or pay the CONTRACTOR or any other party either directly or indirectly for any tax for which an exemption is provided under law."

Add the following paragraph to paragraph 6.20:

"This Project is subject to the Contract Work Hours and Safety Standards Act. The Contract Work Hours and Safety Standards Act (40 USC 327 et seq) and the regulations of the Department of Labor under 29 CFR Part 5 require contractors and subcontractors to pay wages to laborers and mechanics on the basis of an eight hour work day and 40 hour work week and to pay at least time and a half for work performed in excess of these time limitations. Also, the Act prohibits contractors and subcontractors from requiring laborers and mechanics to work in hazardous, unsanitary or dangerous conditions (see 29 CFR Part 1926)."

Add the following paragraph to paragraph 6.23:

"It is the CONTRACTOR'S responsibility to prepare, coordinate and review all submittals prior to delivery to the ENGINEER. The ENGINEER will review each submittal and the first resubmittal without cost to the CONTRACTOR. The CONTRACTOR, however, shall reimburse the OWNER for all reasonable costs associated with the ENGINEER'S and his consultant's review of each subsequent resubmittal. For the purpose of this paragraph only, submittals include Section 01340 - Shop Drawings, Product Data and Samples, Section 01730 - Operation and Maintenance Manuals and Section 01630 - Product Options and Substitutions."

Delete paragraph 6.30 and substitute the following therefor:

6.30 To the fullest extent permitted by law, the CONTRACTOR shall indemnify and hold harmless the OWNER, the ENGINEER, ENGINEER's consultants, and any of their officers, directors, employees, agents, affiliates, subsidiaries and partners from and against all claims, damages, losses and expenses, including but not limited to attorney's fees, arising out of or resulting from the performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including loss of use resulting therefrom, but only to the extent caused in whole or in part by acts or omissions of the CONTRACTOR, a subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall apply to any such claims, damages, losses and expenses which arise and/or are incurred by any person or entity either during the performance of the Work and/or after completion of construction. Nothing in this paragraph shall be construed to negate, abridge, or reduce

other rights or obligations of indemnity or contribution which would otherwise exist as to a party or person indemnified hereunder. CONTRACTOR hereby assumes the responsibility and liability for injury to or death of any and all persons, including the CONTRACTOR's employees, and for any and all damage to property caused by, resulting from, or arising out of any act, omission or neglect on the part of the CONTRACTOR, or of any Subcontractor or of anyone directly or indirectly employed by any of them or of anyone for whose acts, any of them may be liable. The Contractor hereby acknowledges its obligation under the foregoing paragraph to indemnify the Engineer and Owner against judgments suffered because of the contractor's work and to assume the cost of defending the Engineer and Owner against claims as described in the foregoing paragraph.

- 6.30.1 The CONTRACTOR shall bear all losses resulting from the use or storage of explosives and highly inflammable materials and shall indemnify, defend and save harmless the Town and all of its officers, agents, and employees from all suits, damages, claims, liabilities or judgments for bodily injuries or death to any person and for property damage or damage destruction arising out of the use or storage of explosives and highly inflammable materials.
- 6.30.2 The CONTRACTOR further covenants to indemnify, defend and hold harmless the Town, its officers, agents, and employees from and against each and every demand, claim, judgment or liability for or on account of the use of any patented invention, article or appliance included in the materials and equipment agreed to be furnished, supplied or used under this contract.

Delete paragraph 6.32

ARTICLE SGC8 – OWNER'S RESPONSIBILITIES

Delete paragraphs 8.1, 8.2 and 8.5

ARTICLE SGC9 - ENGINEER'S STATUS DURING CONSTRUCTION

Add the following paragraphs to paragraph 9.3:

- "9.3.1 ENGINEER shall furnish a Resident Project Representative (RPR), assistants and other field staff to assist ENGINEER in observing performance of the Work of the CONTRACTOR.

Through more extensive on-site observations of the Work in progress and field checks of materials and equipment by the RPR and assistants, ENGINEER shall endeavor to provide further protection for the OWNER against defects and deficiencies in the Work; but, the furnishing of such services will not make the ENGINEER responsible for or give ENGINEER control over construction means, methods, techniques, sequences or procedures or for safety precautions or programs, or responsibility for CONTRACTOR'S failure to perform the Work in accordance with the Contract Documents.

The duties and responsibilities of the RPR are limited to those of ENGINEER in ENGINEER'S agreement with the OWNER and in the construction Contract Documents, and are further limited and described as follows:

9.3.1.1 General

RPR is ENGINEER'S agent at the site, will act as directed by and under the supervision of the ENGINEER and will confer with ENGINEER regarding RPR'S actions. RPR'S dealings in matters pertaining to the on-site Work shall in general be with ENGINEER and CONTRACTOR, keeping OWNER advised as necessary. RPR'S dealings with subcontractors shall only be through or with the full knowledge and approval of the CONTRACTOR. RPR

shall generally communicate with OWNER with the knowledge of and under the direction of the ENGINEER.

9.3.2.1 Review of Work, Rejection of Defective Work, Inspections and Tests:

- a. Conduct on-site observations of the Work in progress to assist ENGINEER in determining if the Work in general is proceeding in accordance with the Contract Documents.
- b. Report to ENGINEER whenever RPR believes that any work is unsatisfactory, faulty or defective or does not conform to the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise ENGINEER of Work that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.
- c. Verify that tests, equipment and systems start-ups and operating and maintenance training are conducted in the presence of appropriate personnel, and that CONTRACTOR maintains adequate records thereof; and observe, record and report to ENGINEER appropriate details relative to the test procedures and start-ups.
- d. Accompany visiting inspectors representing public or other agencies having jurisdiction over the Project, record the results of these inspections and report to ENGINEER.
- e. Before ENGINEER issues a Certificate of Substantial Completion, submit to CONTRACTOR a list of observed items requiring completion or correction.
- f. Conduct final inspection in the company of ENGINEER, OWNER and CONTRACTOR and prepare a final list of items to be completed or corrected.
- g. Observe that all items on final list have been completed or corrected and make recommendations to ENGINEER concerning acceptance.

Add the following to the end of paragraph 9.4:

"The ENGINEER'S interpretation will be made in accordance with the requirements of Massachusetts General Law Chapter 30, Section 39P."

ARTICLE SGC11 - CHANGE OF CONTRACT PRICE

Paragraph 11.2 is changed by deleting the phrase "but in no event later than thirty days" and replacing with "but in no event later than 7 days".

ARTICLE SGC12 - CHANGE OF CONTRACT TIME

Paragraph 12.1 is changed by deleting the phrase "but in no event later than thirty days" and replacing it with "but in no event later than 7 days".

Add the following paragraphs immediately after Paragraph 12.1:

12.1.1 The ENGINEER shall evaluate CONTRACTOR's request for extension of Contract Time as follows:

- a. The ENGINEER will determine whether the amount of labor (man-hours) reasonably correlates to the magnitude of the addition or reduction of the work.
- b. If the labor requested is determined reasonable, the ENGINEER shall evaluate the impact the additional labor has on the rate of the entire crew. This evaluation will consider whether the addition in work is critical to the CONTRACTOR's schedule and, if critical, to what extent the progress of the CONTRACTOR's overall crew is affected.
- c. The CONTRACTOR shall provide the ENGINEER with all information necessary for ENGINEER to make this analysis.

12.1.2 The CONTRACTOR is not entitled to any time extension until the CONTRACTOR's scheduled completion date exceeds the contract completion date.

12.1.3 The CONTRACTOR is not entitled to recover delay or delay impact damages until the contract completion date is extended.

12.1.4 No extension of time shall be granted because of seasonal, normal or abnormal variations in temperature, humidity, or precipitation, which conditions shall be wholly at the risk of the CONTRACTOR, whether occurring within the time originally scheduled for completion or within the period of any extension granted. Any additional cost of operations or conditions resulting therefrom shall be the responsibility of the CONTRACTOR."

Delete paragraph 12.2 and substitute the following therefor:

"12.2 The CONTRACTOR hereby agrees that the CONTRACTOR shall have no claim for damages of any kind against the OWNER or the ENGINEER on account of any delay in the commencement of the work and/or any hindrance delay or suspension of any portion of the Work, whether such delay is caused by the OWNER, the ENGINEER, or otherwise, except as and to the extent expressly provided under G.L. c.30, §39O. The CONTRACTOR acknowledges that the CONTRACTOR's sole remedy for any such delay and/or suspension will be an extension of time provided the CONTRACTOR complies with notice requirements contained in Article 12 and in Article 10."

ARTICLE SGC13 - CONTRACTOR'S GUARANTEE

Add the following paragraph after 13.1:

"The CONTRACTOR shall guarantee all materials and equipment furnished and work performed for a period of one year from the date of Substantial Completion. The CONTRACTOR warrants and guarantees for a period of one year from the date of Substantial Completion of the system that the completed system is free from all defects due to faulty materials or workmanship and the CONTRACTOR shall, within three (3) days of receipt of such notice, make such corrections as may be necessary by reason of such defects including the repairs or any damage to other parts of the system resulting from such defects. The OWNER will give notice of observed defects with reasonable promptness. In the event that the CONTRACTOR should fail to make such repairs, adjustments or other work that may be made necessary by such defects, the OWNER may do so and charge the CONTRACTOR the cost thereby incurred. The Performance Bond shall remain in full force and effect through the guarantee period.

Delete paragraph 13.6 and substitute the following therefor:

"The CONTRACTOR shall keep the ENGINEER informed of the progress of his work. No work shall be closed or covered until it has been duly inspected and approved. Should uninspected work be covered, the CONTRACTOR shall, at his own expense, uncover all such work so that it can be properly inspected and after such inspection, he shall properly repair and replace all work

interfered with."

Add the following to the beginning of paragraph 13.11:

All material and workmanship (if not otherwise designated by the CONTRACT DOCUMENTS) shall be subject to inspection, examination, and test by the ENGINEER at any and all times during manufacture and/or construction and at any and all places where such manufacture and/or construction are carried on. The ENGINEER shall have the right to reject defective material and workmanship or require its correction.

Add the following to the end of paragraph 13.11:

"If the CONTRACTOR fails to proceed at once with the replacement of rejected material and/or the correction of defective workmanship, the OWNER may by contract or otherwise replace such material and/or correct such workmanship and charge the cost to the CONTRACTOR, or may terminate the right of the CONTRACTOR to proceed, the CONTRACTOR and Surety being liable for any damage to the same extent as provided."

Delete paragraph 13.12 and substitute the following therefor:

"If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or 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, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER's written instructions: (i) correct such defective work, or, if it has been rejected by OWNER, remove it from the site and replace it with work that is not defective, and (ii) satisfactorily correct or remove and replace any damage to other work or the work of others therefrom. If CONTRACTOR does not begin the repairs within ten (10) days of receipt of written notification and promptly comply with the terms of OWNER's written instructions, or in an emergency where delay would cause serious risk, loss or damage, OWNER may have the defective work corrected or the rejected work removed and replaced, and all claims, costs, losses and damages caused by or resulting from such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by CONTRACTOR."

ARTICLE SGC14 – PAYMENTS TO CONTRACTOR AND COMPLETION

Add the following new paragraphs 14.3 – 14.8.4:

"14.3 Payment to the CONTRACTOR shall be made by the OWNER in accordance with Massachusetts General Laws Chapter 30, Section 39K, which is incorporated by reference herein. The payment shall be in full less 5% retainage for furnishing all materials, supplies, labor, services, supervision, tools and equipment and use thereof. Acceptance of periodic payments by the CONTRACTOR shall constitute a waiver of claims known or knowable at the time by the CONTRACTOR except those previously made in writing and identified by the CONTRACTOR as unsettled at the time of periodic payment.

14.4 General Laws Chapter 149, Section 148, requires the weekly payment of employees.

14.4.1 The CONTRACTOR shall submit Weekly Payroll Records Report and Statement of Compliance verifying compliance with the Minimum Prevailing Wage Law, M.G.L. c.149, §§26-27H. These Statements of Compliance shall be submitted as a condition of payment for work performed during the period the reports apply.

14.5 If at any time there shall be evidence of any lien or other claim for which, if established, the OWNER may become liable, directly or indirectly, and which is chargeable to the CONTRACTOR, the OWNER may retain out of the payment then due or thereafter to

become due, an amount sufficient to completely indemnify it against any such claim. If there proves to be any such claims after all the payments are made, the CONTRACTOR shall refund to the OWNER all moneys that the OWNER pays in discharging such claim in consequence of the CONTRACTOR's default.

- 14.6 Until Substantial Completion of the entire project, the OWNER will pay ninety-five percent (95%) of the amount due the CONTRACTOR on account of progress payments. This retainage of five percent (5%), less any amount due from the CONTRACTOR for Liquidated Damages and applicable costs of the ENGINEER, OWNER's PROJECT MANAGER, and ENGINEER's Consultants, and less amounts based on the established value of punch list items and any other OWNER claims or back-charges against the CONTRACTOR, will be paid within sixty-five (65) days of SUBSTANTIAL COMPLETION in accordance with G.L. c.30, §39K.
- 14.7 Each Application for Payment or periodic estimate requesting payment shall be accompanied by a certificate signed by each Subcontractor under pains and penalties of perjury stating that the Subcontractor has been paid all amounts due the Subcontractor on the basis of the previous periodic payment to the CONTRACTOR, or else stating the amount not so paid and the reason for the discrepancy. In the event of any such discrepancy, the CONTRACTOR shall furnish the CONTRACTOR's own written explanation to the OWNER through the ENGINEER. Such waiver or certificate shall be in a form acceptable to the OWNER.
- 14.8 The CONTRACTOR, his Subcontractors and Sub-subcontractors shall obtain prior written approval from the OWNER through the ENGINEER for permission to store materials to be incorporated in the WORK, for which Progress Payments will be requested, at off-site locations. In no case shall stored materials or equipment, whether stored at the site or at some other location, be considered payment unless, in the sole judgment of the OWNER, the materials or equipment are ready for and actually scheduled for prompt use. Written request for payment of stored material must be made thirty (30) days in advance of the due date for the Application for Payment. Any and all charges for storage, including insurance, shall be borne solely by the CONTRACTOR. Before approval, the OWNER will require proper proof of insurance and a letter in which is furnished: (a) the name of the CONTRACTOR and/or the Subcontractor or Sub-subcontractor leasing the storage area; (b) the location of such leased space; (c) the leased area: the entire premises or certain areas of a warehouse given the number of floors or portions thereof; (d) the date on which the material is first stored; and (e) the value of the material stored.
 - 14.8.1 The CONTRACTOR, his Subcontractors and Sub-subcontractors shall notify the ENGINEER and the OWNER to inspect, at least once each month, the materials being stored at any location.
 - 14.8.2 The CONTRACTOR, his Subcontractors and Sub-subcontractors shall mark each sealed carton with the name of the Project and the ENGINEER.
 - 14.8.3 A perpetual inventory shall be maintained for all materials held in storage for which payment has been requested.
 - 14.8.4 Payment for materials stored off site shall be at the sole discretion of the OWNER. Any additional costs to the OWNER resulting from storage of material off site for which payment is requested, such as, but not limited to, travel expenses and time for inspectors, shall be charged to, and paid by, the CONTRACTOR."

Delete paragraph 14.4 and substitute the following therefor:

"Progress Payments will be made in accordance with Massachusetts General Law Chapter 30, Section 39G, or 39K, as applicable."

Add the following new paragraphs 14.7.5 – 14.7.11:

- 14.7.5 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the OWNER is provided by the CONTRACTOR;
- 14.7.6 failure of the CONTRACTOR to make payments properly to Subcontractors for labor, materials or equipment;
- 14.7.7 reasonable evidence that the WORK cannot be completed for the unpaid balance of the CONTRACT PRICE;
- 14.7.8 damage to the OWNER or another contractor;
- 14.7.9 reasonable evidence that the WORK will not be completed within the CONTRACT TIME, and that the retainage currently held by the OWNER would not be adequate to cover actual or liquidated damages for the anticipated delay;
- 14.7.10 failure to carry out the WORK in accordance with the CONTRACT DOCUMENTS; or
- 14.7.11 failure of mechanical trade or electrical trade, or any other trade, subcontractor to comply with mandatory requirements for maintaining record drawings. The CONTRACTOR shall check record drawings each month. Written confirmation that the record drawings are current will be required by the ENGINEER before approval of the CONTRACTOR's monthly payment requisition."

Add the following to the beginning of paragraph 14.8:

"The term "Substantial Completion" as used in this Contract shall mean the point at which as certified in writing by the ENGINEER, the entire Work is at a level of completion in strict compliance with this Contract such that the OWNER or its designee can enjoy beneficial use and can use or operate it in all respects for its intended purpose and only minor items which can be corrected or completed without any material interference with the OWNER's use of the Work remain to be corrected or completed. Partial use of the Project shall not result in the Project being deemed substantially complete, and such partial use shall not be evidence of substantial completion. The CONTRACTOR shall submit, prior to requesting Substantial Completion, written certification that the Project has been completed and is ready for final inspection. Prior to requesting Substantial Completion, the CONTRACTOR shall also submit the following: (1) CONTRACTOR's Affidavit of Payments for Debts and Claims (2) CONTRACTOR's Affidavit of Release of Liens (3) Consent of Surety to Final Payment; and (4) Maintenance Guarantee."

Delete the following from paragraph 14.8:

"OWNER shall have seven" and replace with "OWNER shall have fourteen"

Add the following new paragraphs 14.11.1 – 14.11.2:

- 14.11.1 CONTRACTOR shall submit, prior to requesting final inspection, written certification that: (1) Work has been completed in accordance with Contract Documents; and (2) the Project has been inspected for compliance with Contract Documents. If the ENGINEER does not consider the work finally complete, the CONTRACTOR will be notified, in writing, with the reasons stated. The CONTRACTOR will take immediate steps to correct the stated deficiencies and then submit a second written certification to the ENGINEER.
- 14.11.2 Should the ENGINEER be required to reinspect the work because of failure of the CONTRACTOR to comply with the certification listed in 14.11.1, the ENGINEER will bill the OWNER for all related cost incurred, such cost will be deducted from the CONTRACTOR's payment."

Delete paragraph 14.13 and substitute the following therefor:

"If, on the basis of the ENGINEER's observation of the Work during construction and final inspection and, upon the ENGINEER's review of the final Application for Payment and

accompanying documentation, the ENGINEER is satisfied that the Work has been completed and that the CONTRACTOR's other obligations under the Contract Documents have been fulfilled, the ENGINEER will indicate in writing his recommendation of payment and present the Application to the AWARDING AUTHORITY for payment. Thereupon the ENGINEER will give written notice to the AWARDING AUTHORITY and the CONTRACTOR that the Work is acceptable subject to the provisions of paragraph 14.16. Otherwise, the ENGINEER will return the Application to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment. In such case the CONTRACTOR shall make the necessary corrections and resubmit the Application. If the Application and accompanying documentation are appropriate as to form and substance, the AWARDING AUTHORITY shall in accordance with the applicable Massachusetts General Law, pay the CONTRACTOR the amount recommended by the ENGINEER."

Delete paragraph 14.14 in its entirety.

Delete paragraph 14.16.1 in its entirety.

Delete the following from paragraph 14.16.2:

"other than those previously made in writing which are still unsettled"

ARTICLE SGC15 – SUSPENSION OF WORK AND TERMINATION

Delete paragraph 15.1 and substitute the following therefor:

"The AWARDING AUTHORITY may order, at any time and without cause, the CONTRACTOR to suspend or delay the Work in accordance with Massachusetts General Law Chapter 30, Section 39O."

Add the following new paragraphs 15.2.10 – 15.2.12:

- 15.2.10 If the Work to be done under this Contract shall be abandoned, or if this Contract or any part thereof shall be sublet, 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; or
- 15.2.11 If the CONTRACTOR is adjudged a bankrupt, or if the CONTRACTOR makes a general assignment for the benefit of the CONTRACTOR's creditors or if a receiver is appointed on account of the CONTRACTOR's insolvency; or
- 15.2.12 CONTRACTOR fails to make prompt payment to the Subcontractors or for materials or labor."

Add the following to the end of the final sentence in paragraph 15.3:

"any claim for damages against the CONTRACTOR relating to the CONTRACTOR's performance under this Contract shall survive any termination hereunder."

Delete the following from paragraph 15.4:

"and any expenses sustained plus reasonable termination expenses, which will include, but not be limited to, direct, indirect and consequential costs (including, but not limited to, fees and charges of engineers, architects, attorneys and to there professionals and court arbitration costs)."

Delete paragraph 15.5 in its entirety.

ARTICLE SGC16 - ARBITRATION

Article 16 is deleted in its entirety and shall be replaced with the following:

ARTICLE 16 – DISPUTE RESOLUTION

- “16.1 Decision of ENGINEER: Claims, including those alleging an error or omission by the ENGINEER shall be referred initially to the ENGINEER for decision as provided in Article 10.05. An initial decision by the ENGINEER shall be required as a condition precedent to mediation or litigation of all Claims between the CONTRACTOR and OWNER arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the ENGINEER with no decision having been rendered by the ENGINEER.
- 16.2 Claims, disputes or other matters in question between the parties to this Agreement arising out of or relating to this Agreement or breach thereof shall be subject to and decided by the Superior Court of Massachusetts in Essex County, if jurisdiction exists, and if jurisdiction does not exist in the Superior Court, said action shall be brought in the Ipswich District Court of Massachusetts. A claim, dispute or other matter may be submitted to mediation, in accordance with the provisions of the American Arbitration Association, at the sole discretion of the OWNER.
- 16.3 Notwithstanding any provision contained in the Contract Documents, the OWNER reserves the right to submit a claim, dispute or other matter to mediation or demand arbitration against the CONTRACTOR in connection with the Claims and disputes between the OWNER and the CONTRACTOR, which rights may be exercised by the OWNER unilaterally and in the OWNER’s discretion.
 - 16.3.1 The parties shall share in the mediator’s fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.
 - 16.3.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.”

ARTICLE SGC 17 – MISCELLANEOUS

Add the following new paragraphs 17.5 –

- “17.5 Assignment and Transfer of Contract. The CONTRACTOR shall not sell, transfer, assign by power of attorney or otherwise, sublet, or otherwise dispose of the work or any part thereof, without the previous written consent of the Town by its Contracting Officer. Nor shall the CONTRACTOR either legally or equitably assign any of the moneys payable under this Contract or any claim thereto unless by and with like written consent on the part of the Contracting Officer and the Town Treasurer.
- 17.6 Liability. It is understood and agreed that members of the OWNER or the ENGINEER or any agent or employees of the OWNER signing this Agreement shall not be personally liable hereunder for any action incurred in connection with this Agreement.
- 17.7 Severability. If any provision of this Agreement shall be invalid or unenforceable to any extent or in any application, then the remainder of this Agreement and of such terms and conditions, except to such extent or in such application, shall not be affected thereby, and each and every term and condition of this Agreement shall be valid and enforced to the fullest extent and in the broadest application permitted by law.

17.7 Wage Rates.

17.7.1 Minimum wage rates as determined by the Commissioner of the Department of Labor and Industries under the provisions of Massachusetts General Laws Chapter 149, Sections 26-27D apply to this project. A copy of the wage schedule is included in Attachment A of Section 00830. If, after the Notice of Award, 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 Commissioner. Such approved minimum rate shall be retroactive to the time of the initial employment of such person in such trade or occupation. The CONTRACTOR shall notify the AWARDING AUTHORITY of its intention to employ persons in trades or occupations not classified in the wage determinations as soon as possible in order to allow sufficient time for the AWARDING AUTHORITY to obtain approved rates for such trades or occupations.

17.7.2 The schedule of wages referred to above are minimum rates only, and the AWARDING AUTHORITY will not consider any claims for additional compensation made by CONTRACTOR because of payment by the CONTRACTOR of any wage rate in excess of the applicable rate contained in the Contract. All construction associated with this Contract will be governed by Heavy and Highway Rates.

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

17.7.4 CONTRACTOR and subcontractors shall submit a copy of weekly payroll records to the AWARDING AUTHORITY and the AWARDING AUTHORITY shall retain the records for a minimum of three years.

17.8 The CONTRACTOR shall fully comply with the Dig Safe Laws.

17.9 The CONTRACTOR shall at all times during the construction period protect the excavation, trenches, and building from damage from water caused by rain, springs, ground water, back-up for drains and sewer work that is in his contract, or from any source under his control. He shall provide and maintain pumps and other equipment, coffer dams, ditches and other protection required. He shall construct and maintain all necessary temporary drainage and do all pumping required to keep the excavation and the building areas free from water at all times.

17.10 If, during construction, public or private property is damaged or destroyed as a result of CONTRACTOR's neglect, the CONTRACTOR shall, at his own expense, restore such property to a condition similar or equal to that existing before such damage or injury was done by repairing, rebuilding or replacing it, or otherwise making good such damage or destruction in an acceptable manner.

17.11 Municipal Prerequisites. This Contract shall not be enforceable against the OWNER unless and until the CONTRACTOR complies with this section. This contract is only binding upon, and enforceable against the OWNER if:

1. the contract is signed by the Town of Maynard Town Manager or its designee; and
2. endorsed with approval by the Town Accountant as to appropriation or availability of funds.

17.12 Subject to Appropriation. The obligations of the OWNER hereunder shall be subject to appropriation on a fiscal year basis. In the absence of appropriation, this agreement shall be terminated immediately without liability of the OWNER for damages, lost profits, penalties, or other charges arising from early termination.

17.13 *Conflict of Interest Laws.* Both the OWNER and the CONTRACTOR stipulate to the applicability of the State Conflict of Interest Law (General Laws Chapter 268A), and this contract expressly prohibits any activity which shall constitute a violation of that

law. The CONTRACTOR shall be deemed to have investigated its applicability to the performance of this contract; and by executing the contract documents the CONTRACTOR certifies to the Town that neither it nor its agents, employees or subcontractors are thereby in violation of General Laws Chapter 268A.

- 17.14 *Liability of Public Officials.* To the fullest extent permitted by law, no official, employee, agent, or representative of the Town of Maynard shall be individually or personally liable on any obligation of the Town under this contract.
- 17.15 *Independent Contractor.* The CONTRACTOR is not an employee or agent of the OWNER, but is an independent contractor.
- 17.16 *Certification of Non-Debarment or Suspension.* By execution of this Contract, the CONTRACTOR, pursuant to Section 29F of Chapter 29 of the Massachusetts General Laws, certifies under the penalties of perjury that it is not presently debarred or suspended from doing public construction work in the Commonwealth pursuant to said section, or any applicable debarment or suspension provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

ARTICLE SGC18 - LIQUIDATED DAMAGES

Add the following Article SC18 in its entirety:

ARTICLE SGC18 - LIQUIDATED DAMAGES

- 18.1 If the CONTRACTOR shall neglect, fail or refuse to complete the work within the time herein specified, or any proper extension thereof granted by the OWNER, then the CONTRACTOR does hereby agree, as a part consideration for the awarding of this Contract, to pay to the OWNER the amount specified in the Contract, not as a penalty but as liquidated damages for such breach of contract as hereinafter set forth, for each and every calendar day that the Contract shall be in default after the time stipulated in the Contract for completing the work. Such damages may be retained from time to time by the OWNER from progress payments or any amounts owing to the CONTRACTOR, or otherwise collected. The said amount is fixed and agreed upon by and between the CONTRACTOR and the OWNER because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the OWNER would in such event sustain, and said amount is agreed to be the amount of damages which the OWNER would sustain and said amount shall be retained from time to time by the OWNER from current periodical estimates.
- 18.2 The date of beginning and the Contract Time for the work are essential conditions of the Contract Documents and the work embraced shall be commenced on a date specified in the Notice to Proceed.
- 18.3 The CONTRACTOR will proceed with the work at such rate of progress to insure Final Completion within the Contract Time. It is expressly understood and agreed, by and between the CONTRACTOR and the OWNER, that the Contract Time for the completion of the work described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the work.
- 18.4 If the CONTRACTOR shall fail to fully complete the work within the Contract Time, or extension of time granted by the OWNER, then the CONTRACTOR will pay to the OWNER the amount for liquidated damages as specified in the Bid and Agreement for each calendar day that the CONTRACTOR shall be in default after the time stipulated in the BID and Agreement.

END OF SECTION

Duplex Pump System Installation
Maynard, MA
Engineer: Stantec

Change Order
Section 00820a - Page 1 of 2

SECTION 00820a

CHANGE ORDER

Page 1 of 3

Project Number _____

Change Order Number _____

Contract Amount (As Bid).....\$ _____

Net Change in Contract Price (this Change Order).....\$ _____

Net Change in Contract Price (all other Change Orders).....\$ _____

Total Adjusted Contract Price.....\$ _____

This Change Order extends the time to complete the Work by _____ calendar days.

The extended completion date is _____.

This Change Order checked by: _____

_____ (Chief) Resident Engineer _____ Date

This Change Order is requested by: _____

This Change Order is recommended by

_____ Consultant Engineer _____ P.E. # _____ Date

The undersigned agree to the terms of the Change Order and certifies that such Change Order is in conformance with M. G. L. C.30, Section 39l.

Contractor Name:

_____ Contractor _____ Date

Maynard Department of Public Works

_____ Owner _____ Date

Certification of Appropriation under M. G. L. C.44, Section 31C: Adequate funding in an amount sufficient to cover the total cost of this Change Order is available.

By: _____ Certification Officer _____ Date

Duplex Pump System Installation
Maynard, MA
Engineer: Stantec

Change Order
Section 00820a - Page 2 of 2

CHANGE ORDER

Page 2 of 2

Public Entity Town of Maynard Department of Public Works

Project Number _____ Contract Number _____ Change Order Number _____

Contract Title Duplex Pump System Installation

58 Summer Hill Road

Owner's Name: Town of Maynard Department of Public Works

Owner's Address 195 Main Street Maynard, MA 01754

Contractor's Name: _____

Contractor's Address: _____

Description of Change

1.

Reason for Change

END OF SECTION

SECTION 00820c

WORK DIRECTIVE CHANGE

NO: _____

DATE OF ISSUANCE _____

=====

PROJECT _____

OWNER: _____ OWNER'S PROJECT NO _____

ENGINEER: _____ ENGINEER'S PROJECT NO: _____

CONTRACTOR: _____

CONTRACT FOR: _____

=====

You are directed to proceed promptly with the following change(s):

Description:

Purpose of Work Directive Change:

Attachments: (list documents supporting change)

=====

If a claim is made that the above change(s) have affected the Contract Price or Contract Time, any claim for a Change Order based thereon will involve one of the following methods of determining the effect of the change(s).

Method of determining change in
Contract Price:

- Time and Material
- Unit prices
- Cost plus fixed fee
- Other _____

Method of determining change in
Contract Time:

- CONTRACTOR'S records
- ENGINEER'S records
- Other _____

Estimated increase (decrease) in
Contract Price: \$ _____

If the change involves an increase, the
estimated amount is not to be exceeded
without further authorization.

=====

RECOMMENDED:

By _____
(ENGINEER)

Estimated increase (decrease) in
Contract Time: _____

If the change involves an increase, estimated
time is not to be exceeded without further
authorization.

=====

AUTHORIZED:

By _____
(OWNER)

END OF SECTION

SECTION 00820d

CERTIFICATE OF SUBSTANTIAL COMPLETION

OWNER'S Project No. _____

ENGINEER'S Project No. _____

Project: Construction of _____

CONTRACTOR _____ Contract Date _____

Contract for Construction of _____

Project or Specified Part Shall Include _____

DEFINITION OF SUBSTANTIAL COMPLETION

The date of Substantial Completion of a Project or specified part of a Project is the date when the construction is sufficiently completed, in accordance with the Contract Documents, so that the Project or specified part of the Project can be utilized for the purpose for which it was intended.

To: City of _____, Massachusetts

And To _____
(CONTRACTOR)

Date of Substantial Completion _____

The Work performed under this contract has been inspected by authorized representatives of the OWNER, CONTRACTOR and ENGINEER, and the Project is hereby declared to be substantially completed on the above date.

Duplex Pump System Installation
Maynard, MA
Engineer: Stantec

Certificate of Substantial
Completion
Section 00820d - Page 2 of 2

A tentative list of items to be completed or corrected is appended hereto. The failure to include an item on it does not alter the responsibility of the CONTRACTOR to complete all the Work in accordance with the Contract Documents.

OWNER	AUTHORIZED REPRESENTATIVE	Date
<u>Stantec Consulting Services, Inc</u>		
ENGINEER	AUTHORIZED REPRESENTATIVE	Date

The CONTRACTOR accepts the above Certificate of Substantial Completion and agrees to complete and correct the items on the tentative list.

CONTRACTOR	AUTHORIZED REPRESENTATIVE	Date
------------	---------------------------	------

EXCEPTIONS AS TO GUARANTEES AND WARRANTIES:

ATTACHMENTS:

END OF SECTION

Duplex Pump System Installation
Maynard, MA
Engineer: Stantec

Certificate of Final
Completion of Work
Section 00820e - Page 1 of 2

SECTION 00820e

CERTIFICATE OF FINAL COMPLETION OF WORK

CONTRACT NO. _____ AGREEMENT DATE _____

CONTRACT DESCRIPTION: Duplex Pump System Installation 58 Summer hill Road

COMPLETION DATE PER AGREEMENT AND CHANGE ORDERS _____

FINAL CERTIFICATION OF CONTRACTOR

I hereby certify that the Work as identified in the Final Payment Request for construction Contract Work dated _____, represents full compensation for the actual value of Work completed. All Work completed conforms to the terms of the Agreement and authorized changes.

Date

CONTRACTOR

Signature

Title

FINAL CERTIFICATION OF ENGINEER

I have reviewed the CONTRACTOR'S Final Payment Request dated _____ and hereby certify that to the best of my knowledge, the cost of the Work identified on the Final Estimate represents full compensation for the actual value of Work completed and that the Work has been completed in accordance with the terms of the Agreement and authorized changes. This certification is provided in accord with the terms of General Condition Article 14.

STANTEC CONSULTING SERVICES INC.

Date

Signature

Title

FINAL ACCEPTANCE OF OWNER

I, as representative of the OWNER, accept the above Final Certifications and authorize Final Payment in the amount of \$ _____ and direct the Contractor's attention to the General Conditions - Article 14. The guaranty for all Work completed subsequent to the date of Substantial Completion, expires one (1) year from the date of this Final Acceptance.

DEPARTMENT OF PUBLIC WORKS
MAYNARD, MASSACHUSETTS

Date

Authorized Representative

Signature

END OF SECTION

SECTION 00838

SPECIAL STATE CONDITIONS

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SECTION 00838

SPECIAL STATE CONDITIONS

(MASSACHUSETTS PUBLIC WORKS PROJECTS)

The following Special Conditions are prescribed by statute, regulation or grant condition. The CONTRACTOR is responsible for complying with the latest amended versions of these provisions.

ARTICLE 1. METHOD OF PAYING SUBCONTRACTORS

(General Laws, Chapter 30, Section 39F)

- (a) Forthwith after the general CONTRACTOR receives payment on account of a periodic estimate, the general CONTRACTOR shall pay to each Subcontractor the amount paid for the labor performed and the materials furnished by that Subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the Subcontractor by the general CONTRACTOR.
- (b) Not later than the 65th day after each Subcontractor substantially completes his Work in accordance with the Plans and Specifications, the entire balance due under the Subcontract less amounts retained by the AWARDING AUTHORITY as the estimated cost of completing the incomplete and unsatisfactory items of Work, shall be due the Subcontractor; and the AWARDING AUTHORITY shall pay the amount to the general CONTRACTOR. The general CONTRACTOR shall forthwith pay to the Subcontractor the full amount received from the AWARDING AUTHORITY less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the Subcontractor by the general CONTRACTOR.
- (c) Each payment made by the AWARDING AUTHORITY to the general CONTRACTOR pursuant to subparagraphs (a) and (b) of this paragraph for the labor performed and the materials furnished by a Subcontractor shall be made to the general CONTRACTOR for the account of that Subcontractor; and the AWARDING AUTHORITY shall take reasonable steps to compel the general CONTRACTOR to make each such payment to each such Subcontractor. If the AWARDING AUTHORITY has received a demand for direct payment from a Subcontractor for any amount which has already been included in a payment to the general CONTRACTOR or which is to be included in a payment to the general CONTRACTOR for payment to the Subcontractor as provided in subparagraphs (a) and (b), the AWARDING AUTHORITY shall act upon the demand as provided in this Section.
- (d) If, within 70 days after the Subcontractor has substantially completed the subcontract work, the Subcontractor has not received from the general CONTRACTOR, the balance due under the Subcontract including any amount due for extra labor and materials furnished to the general CONTRACTOR, less any amount retained by the AWARDING AUTHORITY as the estimated cost of completing the incomplete and unsatisfactory items of Work, the Subcontractor may demand direct payment of that balance from the AWARDING AUTHORITY. The demand shall be by a sworn statement delivered to or sent by certified mail to the AWARDING AUTHORITY and a copy shall be delivered to or sent by certified mail to the general CONTRACTOR at the same time. The demand shall contain a detailed breakdown of the balance due under the Subcontract and also a statement of the status of completion of the subcontract work. Any demand made after substantial completion of the subcontractor work shall be valid even if delivered or mailed prior to the 70th day after the Subcontractor has substantially completed the subcontract work. Within 10 days after the Subcontractor has delivered or so mailed the demand to the AWARDING AUTHORITY and delivered or so mailed a copy to the general CONTRACTOR, the general CONTRACTOR may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the

AWARDING AUTHORITY and a copy shall be delivered to or sent by certified mail to the Subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the Subcontract including any amount due for extra labor and materials furnished to the general CONTRACTOR and of the amount due for each claim made by the general CONTRACTOR against the Subcontractor.

(e) Within 15 days after receipt of the demand by the AWARDING AUTHORITY, but in no event prior to the 70th day after the substantial completion of the subcontract work, the AWARDING AUTHORITY shall make direct payment to the Subcontractor of the balance due under the Subcontract including any amount due for extra labor and materials furnished to the general CONTRACTOR, less any amount (i) retained by the AWARDING AUTHORITY as the estimated cost of completing the incomplete or unsatisfactory items of Work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the general CONTRACTOR in the sworn reply; provided, that the AWARDING AUTHORITY shall not deduct from a direct payment any amount as provided in part (iii) if the reply is not sworn to, or for which the sworn reply does not contain the detailed breakdown required by subparagraph (d). The AWARDING AUTHORITY shall make further direct payments to the Subcontractor forthwith after the removal of the basis for deductions from direct payments made as provided in parts (i) and (ii) of this subparagraph.

(f) The AWARDING AUTHORITY shall forthwith deposit the amount deducted from a direct payment as provided in part (iii) of subparagraph (e) in an interest-bearing joint account in the names of the general CONTRACTOR and the Subcontractor in a bank in Massachusetts selected by the AWARDING AUTHORITY or agreed upon by the general CONTRACTOR and the Subcontractor and shall notify the general CONTRACTOR and the Subcontractor of the date of the deposit and the bank receiving the deposit. The bank shall pay the amount in the account, including accrued interest, as provided in an agreement between the general CONTRACTOR and the Subcontractor or as determined by a decree of a court of competent jurisdiction.

(g) All direct payments and all deductions from demands for direct payments deposited in an interest-bearing account or accounts in a bank pursuant to subparagraph (f) shall be made out of amount payable to the general CONTRACTOR at the time of receipt of a demand for direct payment from a Subcontractor and out of amounts which later become payable to the general CONTRACTOR and in the order of receipt of such demands from Subcontractors. All direct payments shall discharge the obligation of the AWARDING AUTHORITY to the general CONTRACTOR to the extent of such payment.

(h) The AWARDING AUTHORITY shall deduct from payments to a general CONTRACTOR amounts which, together with the deposits in interest-bearing accounts pursuant to subparagraph (f), are sufficient to satisfy all unpaid balances of demands for direct payment received from Subcontractors. All such amounts shall be earmarked for such direct payments, and the Subcontractors shall have a right in such deductions prior to any claims against such amounts by creditors of the general CONTRACTOR.

(i) If the Subcontractor does not receive payment as provided in subparagraph (a) or if the general CONTRACTOR does not submit a periodic estimate for the value of the labor or materials performed or furnished by the Subcontractor and the Subcontractor does not receive payment for same when due less the deductions provided for in subparagraph (a), the Subcontractor may demand direct payment by following the procedure in subparagraph (d) and the general CONTRACTOR may file a sworn reply as provided in that same subparagraph. A demand made after the first day of the month following that for which the Subcontractor performed or furnished the labor and materials for which the Subcontractor seeks payment shall be valid even if delivered or mailed prior to the time payment was due on a periodic estimate from the general CONTRACTOR. Thereafter the AWARDING AUTHORITY shall proceed as provided in subparagraph (e), (f), (g) and (h).

ARTICLE 2. METHOD OF PAYING CONTRACTORS
(General Laws, Chapter 30, Section 39K)

Within fifteen days (twenty-four days in the case of the Commonwealth) after receipt from the CONTRACTOR, at the place designated by the AWARDING AUTHORITY if such a place is so designated, of a periodic estimate requesting payment of the amount due for the preceding month, the AWARDING AUTHORITY will make a periodic payment to the CONTRACTOR for the Work performed during the preceding month and for the materials not incorporated in the Work but delivered and suitably stored at the site (or at some location agreed upon in writing) to which the CONTRACTOR has title or to which a Subcontractor has title and has authorized the CONTRACTOR to transfer title to the AWARDING AUTHORITY, less (1) a retention based on its estimate of the fair value of its claims against the CONTRACTOR and less (2) a retention for direct payments to Subcontractors based on demands for same in accordance with the provisions of Chapter 30, Section 39F, and less (3) a retention not exceeding five percent of the approved amount of the periodic payment. After the receipt of a periodic estimate requesting final payment and within sixty-five days after (a) the CONTRACTOR fully completes the Work or substantially completes the Work so that the value of the Work remaining to be done is, in the estimate of the AWARDING AUTHORITY, less than one percent of the original Contract Price, or (b) the CONTRACTOR substantially completes the Work and the AWARDING AUTHORITY takes possession for occupancy, whichever occurs first, the AWARDING AUTHORITY shall pay the CONTRACTOR the entire balance due on the Contract less (1) a retention based on its estimate of the fair value of its claims against the CONTRACTOR and of the cost of completing the incomplete and unsatisfactory items of Work and less (2) a retention for direct payments to Subcontractors based on demands for same in accordance with the provisions of Chapter 30, Section 39F, or based on the record of payments by the CONTRACTOR to the Subcontractors under this Contract if such record of payment indicates that the CONTRACTOR has not paid Subcontractors as provided in Chapter 30, Section 39F. If the AWARDING AUTHORITY fails to make payment as herein provided, there shall be added to each such payment daily interest at the rate of three percentage points above the rediscountrate than charged by the Federal Reserve Bank of Boston commencing on the first day after said payment is due and continuing until the payment is delivered or mailed to the CONTRACTOR; provided, that no interest shall be due, in any event, on the amount due on a periodic estimate for final payment until fifteen days (twenty-four days in the case of the Commonwealth) after receipt of such a periodic estimate from the CONTRACTOR, at the place designated by the AWARDING AUTHORITY if such a place is so designated. The CONTRACTOR agrees to pay to each Subcontractor a portion of any such interest paid in accordance with the amount due each Subcontractor.

The AWARDING AUTHORITY may make changes in any periodic estimate submitted by the CONTRACTOR and the payment due on said periodic estimate shall be computed in accordance with the changes so made, but such changes or any requirement for a corrected periodic estimate shall not affect the due date for the periodic payment or the date for the commencement of interest charges on the amount of the periodic payment computed in accordance with the changes made, as provided herein; provided, that the AWARDING AUTHORITY may, within seven days after receipt, return to the CONTRACTOR for correction, any periodic estimate which is not in the required form or which contains computations not arithmetically correct and, in that event, the date of receipt of such periodic estimate shall be the date of receipt of the corrected periodic estimate in proper form and with arithmetically correct computations. The date of receipt of a periodic estimate received on a Saturday shall be the first working day thereafter. The provisions of Chapter 30, Section 39G shall not apply to any Contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building to which this Section applies.

All periodic estimates shall be submitted to the AWARDING AUTHORITY, or to its designee as set forth in writing to the CONTRACTOR, and the date of receipt by the AWARDING AUTHORITY or its designee shall be marked on the estimate. All periodic estimates shall contain a separate item for each filed subtrade and a column listing the amount paid to each filed Subcontractor as of the date the periodic estimate is filed. The person making payment for the AWARDING AUTHORITY shall add the daily interest provided for herein to each payment for each day beyond the due date based on the date of receipt marked on the estimate.

A certificate of the architect to the effect that the CONTRACTOR has fully or substantially completed the Work shall, subject to the provisions of Chapter 30, Section 39J, be conclusive for the purposes of this Section. (1961, 627, § 1;1971,887,§§ 1,2)

ARTICLE 3. CLAIMS FOR UNFORESEEN CONDITIONS

(General Laws, Chapter 30, Section 39N)

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

ARTICLE 4. CLAIMS FOR DELAY

(General Laws, Chapter 30, Section 39O)

In the event a suspension, delay, interruption or failure to act of the AWARDING AUTHORITY increases the cost of performance to any Subcontractor, that Subcontractor shall have the same rights against the general CONTRACTOR for payment for an increase in the cost of his performance as provisions (a) and (b) give the general CONTRACTOR against the AWARDING

AUTHORITY, but nothing in provisions (a) and (b) shall in any way change, modify or alter any other rights which the general CONTRACTOR or the Subcontractor may have against each other.

(a) The AWARDING AUTHORITY may order the general CONTRACTOR in writing to suspend, delay or interrupt all or any part of the Work for such period of time as it may determine to be appropriate for the convenience of the AWARDING AUTHORITY; provided, however, that if there is a suspension, delay or interruption for 15 days or more or due to a failure of the AWARDING AUTHORITY to act within the time specified in this Contract, the AWARDING AUTHORITY shall make an adjustment in the Contract Price for any increase in the cost of performance of this Contract, but shall not include any profit to the general CONTRACTOR on such increase; and provided further, that the AWARDING AUTHORITY shall not make any adjustment in the Contract Price under this provision for any suspension, delay, interruption or failure to act to the extent that such is due to any cause for which this Contract provides for an equitable adjustment of the Contract Price under any other Contract provisions.

(b) The general CONTRACTOR must submit the amount of a claim under provision (a) to the AWARDING AUTHORITY in writing, as soon as practicable after the end of the suspension, delay, interruption or failure to act and, in any event, not later than the date of final payment under this Contract and, except for costs due to a suspension order, the AWARDING AUTHORITY shall not approve any costs in the claim incurred more than 20 days before the general CONTRACTOR notified the AWARDING AUTHORITY in writing of the act or failure to act involved in the claim.

ARTICLE 5. DECISIONS AND APPROVALS

(General Laws, Chapter 30, Sections 39J and 39P)

Notwithstanding any contrary provision of any Contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building or public works by the Commonwealth, or by any county, city, town, district, board, commission or other public body, when the amount of the contract is more than \$5,000 in the case of the Commonwealth, and more than \$2,000 in the case of any county, city, town, district, board, commission or other public body, a decision, by the contracting body, or by any administrative board, official, or agency, or by any architect or ENGINEER, on a dispute, whether of fact or of law, arising under said contract shall not be final or conclusive if such decision is made in bad faith, fraudulently, capriciously, or arbitrarily is unsupported by substantial evidence, or is based upon error of law. (1961, 538, §1.)

Any decision or interpretation of the specifications, approval of equipment, material or any other approval, or progress of the Work, shall be made promptly and, in any event, no later than 30 days after the written submission for decision; but, if such decision requires extended investigation and study, the AWARDING AUTHORITY, the official, architect or ENGINEER shall, within 30 days after receipt of the submission, give the party making the submission written notice of the reasons why the decision cannot be made within the 30 day period and the date by which the decision will be made.

ARTICLE 6. PREFERENCE IN EMPLOYMENT, WAGES

(General Laws, Chapter 149, Section 26)

In the employment of mechanics and apprentices, teamsters, chauffeurs and laborers in the construction of public works by the Commonwealth, or by a county, town or district, or by persons contracting or subcontracting for such works, preference shall first be given to citizens of the Commonwealth who have been residents of the Commonwealth for at least 6 months at the commencement of their employment, who are male veterans as defined in Class 43 of Section 7 of Chapter 4, and who are qualified to perform the work to which the employment relates; and secondly, to citizens of the Commonwealth generally who have been residents of the Commonwealth for at least 6 months at the commencement of their employment, and if they cannot be obtained in sufficient numbers, then to citizens of the United States, and every contract for such work shall contain a provision to this effect. Each county, town or district in the construction of public works, or persons contracting or subcontracting for such works, shall give preference to veterans and citizens who are residents of such county, town or district. The rate per hour of the wages paid to said mechanics and apprentices, teamsters, chauffeurs and laborers in the construction of public works shall not be less than the rate or rates of wages to be determined by the Commissioner as hereinafter provided; provided, that the wages paid to laborers employed on said works shall not be less than those paid to laborers in the municipal service of the town or towns where works are being constructed; provided, further that where the same public work is to be constructed in two or more towns, the wages paid to laborers shall not be less than those paid to laborers in the municipal service of the town paying the highest rate; provided, further that if, in any of the towns where the Works are to be constructed, a wage rate or wage rates have been established in certain trades and occupations by collective agreements or understandings between organized labor and employers, the rate or rates to be paid on said works shall not be less than the rates as established; provided, further that in towns where no such rate or rates have been established, the wages paid to mechanics and apprentices, teamster, chauffeurs and laborers on public works, shall not be less than the wages paid to the employees in the same trades and occupations by private employers engaged in the construction industry. This section shall also apply to regular employees of the Commonwealth or of a county, town or district, when such employees are employed in the construction, addition to or alteration of public buildings for which special appropriation of more than \$1,000 is provided. Payments by employers to health and welfare plans, pension plans and supplementary unemployment benefit plans under collective bargaining agreements or understandings between organized labor and employers shall be included for the purpose of establishing minimum wage rates as herein provided.

ARTICLE 7. HOURS OF WORK

(General Law, Chapter 149, Section 34)

Every contract, except for the purchase of materials or supplies involving the employment of laborers, workmen, mechanics, foremen or inspectors, to which the Commonwealth or any county or town, subject to Section 30, is a party, shall contain a stipulation that no laborer, workman, mechanic, foreman or inspector working within the Commonwealth, in the employ of the contractor, subcontractor or other person doing or contracting to do the whole or a part of the Work contemplated by the contract, shall be required or permitted to Work more than 8 hours in any one day, or more than 48 hours in any one week, or more than 6 days in any one week, except in case of emergency, or in case any town subject to Section 31 is a party to such a contract, more than 8 hours in any one day, except as aforesaid, provided that in contracts entered into by the Department of Public Works for the construction or reconstruction of highways there may be inserted in said stipulation a provision that said department or any contractor or subcontractor for said department, any employ laborers, workmen, mechanics, foremen and inspectors for more than 8 hours in any one day in such construction or reconstruction when, in the opinion of the Commission of Labor and Industries, public necessity so requires. Every such contract not containing the aforesaid stipulation shall be null and void.

ARTICLE 8. THE COMMONWEALTH OF MASSACHUSETTS: SUPPLEMENTAL EQUAL EMPLOYMENT OPPORTUNITY ANTI-DISCRIMINATION AND AFFIRMATIVE ACTION PROGRAM

(Not Required)

ARTICLE 9. MINIMUM WAGE RATES

In compliance with Massachusetts Laws, Chapter 149, Sections 26 to 27D inclusive, classifications of Labor and Minimum Wage Rates applying thereto have been established by the Department of Labor and Industries of the Commonwealth of Massachusetts and are included in these specifications as an appendix.

ARTICLE 10. SUBSTITUTIONS

(Chapter 30 § 39 M(b))

An item equal to that named or described in the said Specifications may be furnished; and an item shall be considered equal to the item so named or described if (1) it is at least equal in quality, durability, appearance, strength and design, (2) it will perform at least equally the function imposed by the general design for the public work being contracted for or the material being purchased, and (3) it conforms substantially, even with deviations, to the detailed requirements for the item in the said Specifications.

ARTICLE 11. RECORD DRAWINGS

(DWPC: CG-4)

The OWNER shall be responsible for the preparation of all record drawings required by this Contract. This responsibility may be delegated to the ENGINEER. The responsibility for the preparation of record drawings shall not be delegated or transferred to the CONTRACTOR. The CONTRACTOR shall provide data to the ENGINEER as specified in Section 01720 for use in the preparation of the record drawings.

**ARTICLE 12. ADDITIONAL REGULATIONS FOR PAYING CONTRACTORS - (CHAPTER 460
AMENDS C.30 SECT. 396)**

**Chap. 460 AN ACT FURTHER REGULATING PAYMENTS TO CONTRACTORS ON CERTAIN
PUBLIC WORKS CONSTRUCTION PROJECTS.**

Be it enacted, etc., as follows:

The sixth paragraph of Section 39G of Chapter 30 of the General Laws, as appearing in Section 1 of Chapter 506, is hereby amended by adding the following sentence: In the case of periodic payment, the contracting authority may deduct from its payment a retention based on its estimate of the fair value of its claims against the contractor, a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and a retention to secure satisfactory performance of the contractual work not exceeding five percent of the approved amount of any periodic payment, and the same rights to retention shall apply to bonded subcontractors entitled to direct payment under section thirty-nine F of chapter thirty; provided, that a five percent value of all items that are planted in the ground shall be deducted from the periodic payments until final acceptance.

Approved July 17, 1978

ARTICLE 13. PREVENTION OF ACCIDENTS

This project is subject to the safety and Health regulations of the U.S. Department of Labor set forth in 29 CFR, Part I926, and to the Massachusetts Department of Labor and Industries, Division of Industrial Safety "Rules and Regulations for the Prevention of Accidents in Construction Operations (Industrial Bulletin No. 12)." Contractors shall be familiar with the requirements of these regulations.

ARTICLE 14. DIG SAFE

This project is subject to MGL Chapter 353 regarding the use of "Dig Safe" procedures. Contractor shall be familiar with the requirements of these laws.

END OF SECTION



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

Prevailing Wage Rates

MAURA HEALEY
Governor

KIM DRISCOLL
Lt. Governor

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

LAUREN JONES
Secretary

MICHAEL FLANAGAN
Director

Awarding Authority: Maynard Department of Public Works

Contract Number:

City/Town: MAYNARD

Description of Work: Installation of an E-One Duplex Pump System and associated work including upgrade of electric service panel to replace gravity sewer service with a low-pressure sewer service at 58 Summer Hill Road.

Job Location: 58 Summer Hill Rd Maynard, Ma 01754

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

- 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 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, the 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. The annual update requirement is not applicable to 27F "rental of equipment" contracts. **The updated wage schedule must be provided to all contractors, including general and sub-contractors, working on the construction project.**
- 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 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 a sub-contractor.
- Apprentices working on the project are required to be registered with the Massachusetts Division of Apprentice Standards (DAS). Apprentices must keep their apprentice identification card on their persons 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 DAS regardless of whether they are registered with another federal, state, local, or private agency must be paid the journeyworker's rate.**
- Every contractor or subcontractor working on the construction project must 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. For a sample payroll reporting form go to <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.
- Contractors must obtain the wage schedules from awarding authorities. Failure of a contractor or subcontractor to pay the prevailing wage rates listed on the wage schedule to all employees who perform construction work on the project is a violation of the law and subjects the contractor or subcontractor to civil and criminal penalties.
- Employees not receiving the prevailing wage rate set forth on the wage schedule may file a complaint with the Fair Labor Division of the office of the Attorney General at (617) 727-3465.

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	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>	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>	12/01/2021	\$36.14	\$13.41	\$16.01	\$0.00	\$65.56
ADS/SUBMERSIBLE PILOT <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR <i>LABORERS - ZONE 2</i>	06/01/2023	\$38.21	\$9.40	\$16.89	\$0.00	\$64.50
	12/01/2023	\$39.11	\$9.40	\$16.89	\$0.00	\$65.40
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2023	\$38.21	\$9.40	\$16.89	\$0.00	\$64.50
	12/01/2023	\$39.11	\$9.40	\$16.89	\$0.00	\$65.40
	06/01/2024	\$40.44	\$9.40	\$16.89	\$0.00	\$66.73
	12/01/2024	\$41.77	\$9.40	\$16.89	\$0.00	\$68.06
	06/01/2025	\$43.16	\$9.40	\$16.89	\$0.00	\$69.45
	12/01/2025	\$44.54	\$9.40	\$16.89	\$0.00	\$70.83
	06/01/2026	\$45.98	\$9.40	\$16.89	\$0.00	\$72.27
	12/01/2026	\$47.42	\$9.40	\$16.89	\$0.00	\$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS REMOVER - PIPE / MECH. EQUIPT. <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	12/01/2020	\$38.10	\$12.80	\$9.45	\$0.00	\$60.35
ASPHALT RAKER <i>LABORERS - ZONE 2</i>	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
	06/01/2024	\$39.94	\$9.40	\$16.89	\$0.00	\$66.23
	12/01/2024	\$41.27	\$9.40	\$16.89	\$0.00	\$67.56
	06/01/2025	\$42.66	\$9.40	\$16.89	\$0.00	\$68.95
	12/01/2025	\$44.04	\$9.40	\$16.89	\$0.00	\$70.33
	06/01/2026	\$45.48	\$9.40	\$16.89	\$0.00	\$71.77
	12/01/2026	\$46.92	\$9.40	\$16.89	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$54.28	\$14.75	\$16.15	\$0.00	\$85.18
	12/01/2023	\$55.53	\$14.75	\$16.15	\$0.00	\$86.43
	06/01/2024	\$56.83	\$14.75	\$16.15	\$0.00	\$87.73
	12/01/2024	\$58.28	\$14.75	\$16.15	\$0.00	\$89.18
	06/01/2025	\$59.58	\$14.75	\$16.15	\$0.00	\$90.48
	12/01/2025	\$61.03	\$14.75	\$16.15	\$0.00	\$91.93
	06/01/2026	\$62.33	\$14.75	\$16.15	\$0.00	\$93.23
	12/01/2026	\$63.78	\$14.75	\$16.15	\$0.00	\$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
BACKHOE/FRONT-END LOADER <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$54.28	\$14.75	\$16.15	\$0.00	\$85.18
	12/01/2023	\$55.53	\$14.75	\$16.15	\$0.00	\$86.43
	06/01/2024	\$56.83	\$14.75	\$16.15	\$0.00	\$87.73
	12/01/2024	\$58.28	\$14.75	\$16.15	\$0.00	\$89.18
	06/01/2025	\$59.58	\$14.75	\$16.15	\$0.00	\$90.48
	12/01/2025	\$61.03	\$14.75	\$16.15	\$0.00	\$91.93
	06/01/2026	\$62.33	\$14.75	\$16.15	\$0.00	\$93.23
	12/01/2026	\$63.78	\$14.75	\$16.15	\$0.00	\$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER <i>LABORERS - ZONE 2</i>	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER <i>LABORERS - ZONE 2</i>	06/01/2023	\$38.21	\$9.40	\$16.89	\$0.00	\$64.50
	12/01/2023	\$39.11	\$9.40	\$16.89	\$0.00	\$65.40
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2023	\$38.21	\$9.40	\$16.89	\$0.00	\$64.50
	12/01/2023	\$39.11	\$9.40	\$16.89	\$0.00	\$65.40
	06/01/2024	\$40.44	\$9.40	\$16.89	\$0.00	\$66.73
	12/01/2024	\$41.77	\$9.40	\$16.89	\$0.00	\$68.06
	06/01/2025	\$43.16	\$9.40	\$16.89	\$0.00	\$69.45
	12/01/2025	\$44.54	\$9.40	\$16.89	\$0.00	\$70.83
	06/01/2026	\$45.98	\$9.40	\$16.89	\$0.00	\$72.27
	12/01/2026	\$47.42	\$9.40	\$16.89	\$0.00	\$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER <i>BOILERMAKERS LOCAL 29</i>	01/01/2023	\$47.37	\$7.07	\$20.31	\$0.00	\$74.75
	01/01/2024	\$48.12	\$7.07	\$20.60	\$0.00	\$75.79

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - BOILERMAKER - Local 29

Effective Date - 01/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$30.79	\$7.07	\$13.22	\$0.00	\$51.08
2	65	\$30.79	\$7.07	\$13.22	\$0.00	\$51.08
3	70	\$33.16	\$7.07	\$14.23	\$0.00	\$54.46
4	75	\$35.53	\$7.07	\$15.24	\$0.00	\$57.84
5	80	\$37.90	\$7.07	\$16.25	\$0.00	\$61.22
6	85	\$40.26	\$7.07	\$17.28	\$0.00	\$64.61
7	90	\$42.63	\$7.07	\$18.28	\$0.00	\$67.98
8	95	\$45.00	\$7.07	\$19.32	\$0.00	\$71.39

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
2	65	\$31.28	\$7.07	\$13.22	\$0.00	\$51.57
3	70	\$33.68	\$7.07	\$14.23	\$0.00	\$54.98
4	75	\$36.09	\$7.07	\$15.24	\$0.00	\$58.40
5	80	\$38.50	\$7.07	\$16.25	\$0.00	\$61.82
6	85	\$40.90	\$7.07	\$17.28	\$0.00	\$65.25
7	90	\$43.31	\$7.07	\$18.28	\$0.00	\$68.66
8	95	\$45.71	\$7.07	\$19.32	\$0.00	\$72.10

Notes:

Apprentice to Journeyworker Ratio:1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) BRICKLAYERS LOCAL 3 (LOWELL)	02/01/2023	\$58.21	\$11.49	\$21.65	\$0.00	\$91.35
	08/01/2023	\$60.26	\$11.49	\$21.65	\$0.00	\$93.40
	02/01/2024	\$61.51	\$11.49	\$21.65	\$0.00	\$94.65
	08/01/2024	\$63.61	\$11.49	\$21.65	\$0.00	\$96.75
	02/01/2025	\$64.91	\$11.49	\$21.65	\$0.00	\$98.05
	08/01/2025	\$67.06	\$11.49	\$21.65	\$0.00	\$100.20
	02/01/2026	\$68.41	\$11.49	\$21.65	\$0.00	\$101.55
	08/01/2026	\$70.61	\$11.49	\$21.65	\$0.00	\$103.75
	02/01/2027	\$72.01	\$11.49	\$21.65	\$0.00	\$105.15

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - BRICK/PLASTER/CEMENT MASON - Local 3 Lowell

Effective Date - 02/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$29.11	\$11.49	\$21.65	\$0.00	\$62.25
2	60	\$34.93	\$11.49	\$21.65	\$0.00	\$68.07
3	70	\$40.75	\$11.49	\$21.65	\$0.00	\$73.89
4	80	\$46.57	\$11.49	\$21.65	\$0.00	\$79.71
5	90	\$52.39	\$11.49	\$21.65	\$0.00	\$85.53

Effective Date - 08/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.13	\$11.49	\$21.65	\$0.00	\$63.27
2	60	\$36.16	\$11.49	\$21.65	\$0.00	\$69.30
3	70	\$42.18	\$11.49	\$21.65	\$0.00	\$75.32
4	80	\$48.21	\$11.49	\$21.65	\$0.00	\$81.35
5	90	\$54.23	\$11.49	\$21.65	\$0.00	\$87.37

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$53.69	\$14.75	\$16.15	\$0.00	\$84.59
	12/01/2023	\$54.93	\$14.75	\$16.15	\$0.00	\$85.83
	06/01/2024	\$56.21	\$14.75	\$16.15	\$0.00	\$87.11
	12/01/2024	\$57.65	\$14.75	\$16.15	\$0.00	\$88.55
	06/01/2025	\$58.93	\$14.75	\$16.15	\$0.00	\$89.83
	12/01/2025	\$60.37	\$14.75	\$16.15	\$0.00	\$91.27
	06/01/2026	\$61.65	\$14.75	\$16.15	\$0.00	\$92.55
	12/01/2026	\$63.09	\$14.75	\$16.15	\$0.00	\$93.99

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

CAISSON & UNDERPINNING BOTTOM MAN <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2023	\$44.73	\$9.40	\$17.97	\$0.00	\$72.10
	12/01/2023	\$45.98	\$9.40	\$17.97	\$0.00	\$73.35
	06/01/2024	\$47.46	\$9.40	\$17.97	\$0.00	\$74.83
	12/01/2024	\$48.93	\$9.40	\$17.97	\$0.00	\$76.30
	06/01/2025	\$50.43	\$9.40	\$17.97	\$0.00	\$77.80
	12/01/2025	\$51.93	\$9.40	\$17.97	\$0.00	\$79.30
	06/01/2026	\$53.48	\$9.40	\$17.97	\$0.00	\$80.85
	12/01/2026	\$54.98	\$9.40	\$17.97	\$0.00	\$82.35

For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CAISSON & UNDERPINNING LABORER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2023	\$43.58	\$9.40	\$17.97	\$0.00	\$70.95
	12/01/2023	\$44.83	\$9.40	\$17.97	\$0.00	\$72.20
	06/01/2024	\$46.31	\$9.40	\$17.97	\$0.00	\$73.68
	12/01/2024	\$47.78	\$9.40	\$17.97	\$0.00	\$75.15
	06/01/2025	\$49.28	\$9.40	\$17.97	\$0.00	\$76.65
	12/01/2025	\$50.78	\$9.40	\$17.97	\$0.00	\$78.15
	06/01/2026	\$52.33	\$9.40	\$17.97	\$0.00	\$79.70
	12/01/2026	\$53.83	\$9.40	\$17.97	\$0.00	\$81.20
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2023	\$43.58	\$9.40	\$17.97	\$0.00	\$70.95
	12/01/2023	\$44.83	\$9.40	\$17.97	\$0.00	\$72.20
	06/01/2024	\$46.31	\$9.40	\$17.97	\$0.00	\$73.68
	12/01/2024	\$47.78	\$9.40	\$17.97	\$0.00	\$75.15
	06/01/2025	\$49.28	\$9.40	\$17.97	\$0.00	\$76.65
	12/01/2025	\$50.78	\$9.40	\$17.97	\$0.00	\$78.15
	06/01/2026	\$52.33	\$9.40	\$17.97	\$0.00	\$79.70
	12/01/2026	\$53.83	\$9.40	\$17.97	\$0.00	\$81.20
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR <i>LABORERS - ZONE 2</i>	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
CARPENTER <i>CARPENTERS -ZONE 2 (Eastern Massachusetts)</i>	03/01/2023	\$45.12	\$9.33	\$19.97	\$0.00	\$74.42

Apprentice - CARPENTER - Zone 2 Eastern MA

Effective Date - 03/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.56	\$9.33	\$1.73	\$0.00	\$33.62
2	60	\$27.07	\$9.33	\$1.73	\$0.00	\$38.13
3	70	\$31.58	\$9.33	\$14.78	\$0.00	\$55.69
4	75	\$33.84	\$9.33	\$14.78	\$0.00	\$57.95
5	80	\$36.10	\$9.33	\$16.51	\$0.00	\$61.94
6	80	\$36.10	\$9.33	\$16.51	\$0.00	\$61.94
7	90	\$40.61	\$9.33	\$18.24	\$0.00	\$68.18
8	90	\$40.61	\$9.33	\$18.24	\$0.00	\$68.18

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 \$30.71/ 3&4 \$36.93/ 5&6 \$56.82/ 7&8 \$63.06

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME <i>CARPENTERS-ZONE 3 (Wood Frame)</i>	04/01/2023	\$24.16	\$7.21	\$4.80	\$0.00	\$36.17
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All Aspects of New Wood Frame Work

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - CARPENTER (Wood Frame) - Zone 3

Effective Date - 04/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$14.50	\$7.21	\$0.00	\$0.00	\$21.71
2	60	\$14.50	\$7.21	\$0.00	\$0.00	\$21.71
3	65	\$15.70	\$7.21	\$0.00	\$0.00	\$22.91
4	70	\$16.91	\$7.21	\$0.00	\$0.00	\$24.12
5	75	\$18.12	\$7.21	\$3.80	\$0.00	\$29.13
6	80	\$19.33	\$7.21	\$3.80	\$0.00	\$30.34
7	85	\$20.54	\$7.21	\$3.80	\$0.00	\$31.55
8	90	\$21.74	\$7.21	\$3.80	\$0.00	\$32.75

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 \$17.86/ 3&4 \$20.22/ 5&6 \$27.57/ 7&8 \$29.94

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING BRICKLAYERS LOCAL 3 (LOWELL)	07/01/2023	\$50.59	\$12.75	\$22.74	\$0.87	\$86.95
	01/01/2024	\$51.73	\$12.75	\$22.74	\$0.87	\$88.09

Apprentice - CEMENT MASONRY/PLASTERING - Lowell

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.30	\$12.75	\$15.49	\$0.00	\$53.54
2	60	\$30.35	\$12.75	\$22.74	\$0.87	\$66.71
3	65	\$32.88	\$12.75	\$22.74	\$0.87	\$69.24
4	70	\$35.41	\$12.75	\$22.74	\$0.87	\$71.77
5	75	\$37.94	\$12.75	\$22.74	\$0.87	\$74.30
6	80	\$40.47	\$12.75	\$22.74	\$0.87	\$76.83
7	90	\$45.53	\$12.75	\$22.74	\$0.87	\$81.89

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.87	\$12.75	\$15.49	\$0.00	\$54.11
2	60	\$31.04	\$12.75	\$22.74	\$0.87	\$67.40
3	65	\$33.62	\$12.75	\$22.74	\$0.87	\$69.98
4	70	\$36.21	\$12.75	\$22.74	\$0.87	\$72.57
5	75	\$38.80	\$12.75	\$22.74	\$0.87	\$75.16
6	80	\$41.38	\$12.75	\$22.74	\$0.87	\$77.74
7	90	\$46.56	\$12.75	\$22.74	\$0.87	\$82.92

Notes:

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

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CHAIN SAW OPERATOR	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
<i>LABORERS - ZONE 2</i>	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES	06/01/2023	\$55.35	\$14.75	\$16.15	\$0.00	\$86.25
<i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$56.63	\$14.75	\$16.15	\$0.00	\$87.53
	06/01/2024	\$57.95	\$14.75	\$16.15	\$0.00	\$88.85
	12/01/2024	\$59.43	\$14.75	\$16.15	\$0.00	\$90.33
	06/01/2025	\$60.76	\$14.75	\$16.15	\$0.00	\$91.66
	12/01/2025	\$62.23	\$14.75	\$16.15	\$0.00	\$93.13
	06/01/2026	\$63.56	\$14.75	\$16.15	\$0.00	\$94.46
	12/01/2026	\$65.04	\$14.75	\$16.15	\$0.00	\$95.94
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR	06/01/2023	\$35.30	\$14.75	\$16.15	\$0.00	\$66.20
<i>OPERATING ENGINEERS LOCAL 4</i>	12/01/2023	\$36.12	\$14.75	\$16.15	\$0.00	\$67.02
	06/01/2024	\$36.97	\$14.75	\$16.15	\$0.00	\$67.87
	12/01/2024	\$37.92	\$14.75	\$16.15	\$0.00	\$68.82
	06/01/2025	\$38.77	\$14.75	\$16.15	\$0.00	\$69.67
	12/01/2025	\$39.72	\$14.75	\$16.15	\$0.00	\$70.62
	06/01/2026	\$40.58	\$14.75	\$16.15	\$0.00	\$71.48
	12/01/2026	\$41.53	\$14.75	\$16.15	\$0.00	\$72.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE)	07/01/2023	\$55.51	\$9.65	\$23.70	\$0.00	\$88.86
<i>PAINTERS LOCAL 35 - ZONE 2</i>	01/01/2024	\$56.06	\$9.95	\$23.95	\$0.00	\$89.96
	07/01/2024	\$57.26	\$9.95	\$23.95	\$0.00	\$91.16
	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 07/01/2023

Step	percent	Apprentice	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50		\$27.76	\$9.65	\$0.00	\$0.00	\$37.41
2	55		\$30.53	\$9.65	\$6.55	\$0.00	\$46.73
3	60		\$33.31	\$9.65	\$7.14	\$0.00	\$50.10
4	65		\$36.08	\$9.65	\$7.74	\$0.00	\$53.47
5	70		\$38.86	\$9.65	\$20.13	\$0.00	\$68.64
6	75		\$41.63	\$9.65	\$20.73	\$0.00	\$72.01
7	80		\$44.41	\$9.65	\$21.32	\$0.00	\$75.38
8	90		\$49.96	\$9.65	\$22.51	\$0.00	\$82.12

Effective Date - 01/01/2024

Step	percent	Apprentice	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50		\$28.03	\$9.95	\$0.00	\$0.00	\$37.98
2	55		\$30.83	\$9.95	\$6.66	\$0.00	\$47.44
3	60		\$33.64	\$9.95	\$7.26	\$0.00	\$50.85
4	65		\$36.44	\$9.95	\$7.87	\$0.00	\$54.26
5	70		\$39.24	\$9.95	\$20.32	\$0.00	\$69.51
6	75		\$42.05	\$9.95	\$20.93	\$0.00	\$72.93
7	80		\$44.85	\$9.95	\$21.53	\$0.00	\$76.33
8	90		\$50.45	\$9.95	\$22.74	\$0.00	\$83.14

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN LABORERS - ZONE 2	06/01/2023	\$43.73	\$9.40	\$17.82	\$0.00	\$70.95
	12/01/2023	\$44.98	\$9.40	\$17.82	\$0.00	\$72.20
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR LABORERS - ZONE 2	06/01/2023	\$44.73	\$9.40	\$17.82	\$0.00	\$71.95
	12/01/2023	\$45.98	\$9.40	\$17.82	\$0.00	\$73.20
For apprentice rates see "Apprentice- LABORER"						
DEMO: BURNERS LABORERS - ZONE 2	06/01/2023	\$44.48	\$9.40	\$17.82	\$0.00	\$71.70
	12/01/2023	\$45.73	\$9.40	\$17.82	\$0.00	\$72.95
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER LABORERS - ZONE 2	06/01/2023	\$44.73	\$9.40	\$17.82	\$0.00	\$71.95
	12/01/2023	\$45.98	\$9.40	\$17.82	\$0.00	\$73.20
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR LABORERS - ZONE 2	06/01/2023	\$44.48	\$9.40	\$17.82	\$0.00	\$71.70
	12/01/2023	\$45.73	\$9.40	\$17.82	\$0.00	\$72.95
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER LABORERS - ZONE 2	06/01/2023	\$43.73	\$9.40	\$17.82	\$0.00	\$70.95
	12/01/2023	\$44.98	\$9.40	\$17.82	\$0.00	\$72.20
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DIRECTIONAL DRILL MACHINE OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$53.69	\$14.75	\$16.15	\$0.00	\$84.59
	12/01/2023	\$54.93	\$14.75	\$16.15	\$0.00	\$85.83
	06/01/2024	\$56.21	\$14.75	\$16.15	\$0.00	\$87.11
	12/01/2024	\$57.65	\$14.75	\$16.15	\$0.00	\$88.55
	06/01/2025	\$58.93	\$14.75	\$16.15	\$0.00	\$89.83
	12/01/2025	\$60.37	\$14.75	\$16.15	\$0.00	\$91.27
	06/01/2026	\$61.65	\$14.75	\$16.15	\$0.00	\$92.55
	12/01/2026	\$63.09	\$14.75	\$16.15	\$0.00	\$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$68.70	\$9.40	\$23.12	\$0.00	\$101.22
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$73.60	\$9.40	\$23.12	\$0.00	\$106.12
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) <i>PILE DRIVER LOCAL 56 (ZONE 1)</i>	08/01/2020	\$103.05	\$9.40	\$23.12	\$0.00	\$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) <i>DRAWBRIDGE - SEIU LOCAL 888</i>	07/01/2020	\$26.77	\$6.67	\$3.93	\$0.16	\$37.53
ELECTRICIAN <i>ELECTRICIANS LOCAL 103</i>	03/01/2023	\$59.23	\$13.00	\$21.63	\$0.00	\$93.86

Apprentice - ELECTRICIAN - Local 103

Effective Date - 03/01/2023

Step	percent	Apprentice	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40		\$23.69	\$13.00	\$0.71	\$0.00	\$37.40
2	40		\$23.69	\$13.00	\$0.71	\$0.00	\$37.40
3	45		\$26.65	\$13.00	\$16.13	\$0.00	\$55.78
4	45		\$26.65	\$13.00	\$16.13	\$0.00	\$55.78
5	50		\$29.62	\$13.00	\$16.63	\$0.00	\$59.25
6	55		\$32.58	\$13.00	\$17.13	\$0.00	\$62.71
7	60		\$35.54	\$13.00	\$17.63	\$0.00	\$66.17
8	65		\$38.50	\$13.00	\$18.13	\$0.00	\$69.63
9	70		\$41.46	\$13.00	\$18.62	\$0.00	\$73.08
10	75		\$44.42	\$13.00	\$19.13	\$0.00	\$76.55

Notes:

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

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR <i>ELEVATOR CONSTRUCTORS LOCAL 4</i>	01/01/2022	\$65.62	\$16.03	\$20.21	\$0.00	\$101.86
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Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - ELEVATOR CONSTRUCTOR - Local 4

Effective Date - 01/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$32.81	\$16.03	\$0.00	\$0.00	\$48.84
2	55	\$36.09	\$16.03	\$20.21	\$0.00	\$72.33
3	65	\$42.65	\$16.03	\$20.21	\$0.00	\$78.89
4	70	\$45.93	\$16.03	\$20.21	\$0.00	\$82.17
5	80	\$52.50	\$16.03	\$20.21	\$0.00	\$88.74

Notes:

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

Apprentice to Journeyworker Ratio:1:1

ELEVATOR CONSTRUCTOR HELPER <i>ELEVATOR CONSTRUCTORS LOCAL 4</i>	01/01/2022	\$45.93	\$16.03	\$20.21	\$0.00	\$82.17
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For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"

FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
	06/01/2024	\$39.94	\$9.40	\$16.89	\$0.00	\$66.23
	12/01/2024	\$41.27	\$9.40	\$16.89	\$0.00	\$67.56
	06/01/2025	\$42.66	\$9.40	\$16.89	\$0.00	\$68.95
	12/01/2025	\$44.04	\$9.40	\$16.89	\$0.00	\$70.33
	06/01/2026	\$45.48	\$9.40	\$16.89	\$0.00	\$71.77
	12/01/2026	\$46.92	\$9.40	\$16.89	\$0.00	\$73.21

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

FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	05/01/2023	\$49.06	\$14.50	\$16.15	\$0.00	\$79.71
	11/01/2023	\$50.30	\$14.50	\$16.15	\$0.00	\$80.95
	05/01/2024	\$51.54	\$14.50	\$16.15	\$0.00	\$82.19
	11/01/2024	\$52.83	\$14.50	\$16.15	\$0.00	\$83.48
	05/01/2025	\$54.27	\$14.50	\$16.15	\$0.00	\$84.92
	11/01/2025	\$55.56	\$14.50	\$16.15	\$0.00	\$86.21
	05/01/2026	\$57.00	\$14.50	\$16.15	\$0.00	\$87.65
	11/01/2026	\$58.29	\$14.50	\$16.15	\$0.00	\$88.94
	05/01/2027	\$59.72	\$14.50	\$16.15	\$0.00	\$90.37

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	05/01/2023	\$50.62	\$14.50	\$16.15	\$0.00	\$81.27
	11/01/2023	\$51.87	\$14.50	\$16.15	\$0.00	\$82.52
	05/01/2024	\$53.12	\$14.50	\$16.15	\$0.00	\$83.77
	11/01/2024	\$54.42	\$14.50	\$16.15	\$0.00	\$85.07
	05/01/2025	\$55.87	\$14.50	\$16.15	\$0.00	\$86.52
	11/01/2025	\$57.17	\$14.50	\$16.15	\$0.00	\$87.82
	05/01/2026	\$58.62	\$14.50	\$16.15	\$0.00	\$89.27
	11/01/2026	\$59.92	\$14.50	\$16.15	\$0.00	\$90.57
	05/01/2027	\$61.37	\$14.50	\$16.15	\$0.00	\$92.02

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY <i>OPERATING ENGINEERS LOCAL 4</i>	05/01/2023	\$24.20	\$14.50	\$16.15	\$0.00	\$54.85
	11/01/2023	\$24.93	\$14.50	\$16.15	\$0.00	\$55.58
	05/01/2024	\$25.66	\$14.50	\$16.15	\$0.00	\$56.31
	11/01/2024	\$26.42	\$14.50	\$16.15	\$0.00	\$57.07
	05/01/2025	\$27.27	\$14.50	\$16.15	\$0.00	\$57.92
	11/01/2025	\$28.03	\$14.50	\$16.15	\$0.00	\$58.68
	05/01/2026	\$28.88	\$14.50	\$16.15	\$0.00	\$59.53
	11/01/2026	\$29.64	\$14.50	\$16.15	\$0.00	\$60.29
	05/01/2027	\$30.49	\$14.50	\$16.15	\$0.00	\$61.14
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER <i>ELECTRICIANS LOCAL 103</i>	03/01/2023	\$59.23	\$13.00	\$21.63	\$0.00	\$93.86
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING <i>ELECTRICIANS LOCAL 103</i>	03/01/2023	\$48.34	\$13.00	\$19.01	\$0.00	\$80.35
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$43.96	\$14.75	\$16.15	\$0.00	\$74.86
	12/01/2023	\$44.97	\$14.75	\$16.15	\$0.00	\$75.87
	06/01/2024	\$46.03	\$14.75	\$16.15	\$0.00	\$76.93
	12/01/2024	\$47.21	\$14.75	\$16.15	\$0.00	\$78.11
	06/01/2025	\$48.27	\$14.75	\$16.15	\$0.00	\$79.17
	12/01/2025	\$49.44	\$14.75	\$16.15	\$0.00	\$80.34
	06/01/2026	\$50.50	\$14.75	\$16.15	\$0.00	\$81.40
	12/01/2026	\$51.68	\$14.75	\$16.15	\$0.00	\$82.58
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2023	\$25.98	\$9.40	\$16.89	\$0.00	\$52.27
	12/01/2023	\$25.98	\$9.40	\$16.89	\$0.00	\$52.27
	06/01/2024	\$27.01	\$9.40	\$16.89	\$0.00	\$53.30
	12/01/2024	\$27.01	\$9.40	\$16.89	\$0.00	\$53.30
	06/01/2025	\$28.09	\$9.40	\$16.89	\$0.00	\$54.38
	12/01/2025	\$28.09	\$9.40	\$16.89	\$0.00	\$54.38
	06/01/2026	\$29.21	\$9.40	\$16.89	\$0.00	\$55.50
	12/01/2026	\$29.21	\$9.40	\$16.89	\$0.00	\$55.50
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
FLOORCOVERER <i>FLOORCOVERERS LOCAL 2168 ZONE 1</i>	03/01/2022	\$51.77	\$9.33	\$20.27	\$0.00	\$81.37

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - FLOORCOVERER - Local 2168 Zone I

Effective Date - 03/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.89	\$9.33	\$1.79	\$0.00	\$37.01
2	55	\$28.47	\$9.33	\$1.79	\$0.00	\$39.59
3	60	\$31.06	\$9.33	\$14.90	\$0.00	\$55.29
4	65	\$33.65	\$9.33	\$14.90	\$0.00	\$57.88
5	70	\$36.24	\$9.33	\$16.69	\$0.00	\$62.26
6	75	\$38.83	\$9.33	\$16.69	\$0.00	\$64.85
7	80	\$41.42	\$9.33	\$18.48	\$0.00	\$69.23
8	85	\$44.00	\$9.33	\$18.48	\$0.00	\$71.81

Notes: Steps are 750 hrs.

% After 10/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)

Step 1&2 \$32.94/ 3&4 \$39.66/ 5&6 \$60.32/ 7&8 \$67.10

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$54.28	\$14.75	\$16.15	\$0.00	\$85.18
	12/01/2023	\$55.53	\$14.75	\$16.15	\$0.00	\$86.43
	06/01/2024	\$56.83	\$14.75	\$16.15	\$0.00	\$87.73
	12/01/2024	\$58.28	\$14.75	\$16.15	\$0.00	\$89.18
	06/01/2025	\$59.58	\$14.75	\$16.15	\$0.00	\$90.48
	12/01/2025	\$61.03	\$14.75	\$16.15	\$0.00	\$91.93
	06/01/2026	\$62.33	\$14.75	\$16.15	\$0.00	\$93.23
	12/01/2026	\$63.78	\$14.75	\$16.15	\$0.00	\$94.68

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

GENERATOR/LIGHTING PLANT/HEATERS <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$35.30	\$14.75	\$16.15	\$0.00	\$66.20
	12/01/2023	\$36.12	\$14.75	\$16.15	\$0.00	\$67.02
	06/01/2024	\$36.97	\$14.75	\$16.15	\$0.00	\$67.87
	12/01/2024	\$37.92	\$14.75	\$16.15	\$0.00	\$68.82
	06/01/2025	\$38.77	\$14.75	\$16.15	\$0.00	\$69.67
	12/01/2025	\$39.72	\$14.75	\$16.15	\$0.00	\$70.62
	06/01/2026	\$40.58	\$14.75	\$16.15	\$0.00	\$71.48
	12/01/2026	\$41.53	\$14.75	\$16.15	\$0.00	\$72.43

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) <i>GLAZIERS LOCAL 35 (ZONE 2)</i>	07/01/2023	\$45.01	\$9.65	\$23.70	\$0.00	\$78.36
	01/01/2024	\$45.56	\$9.95	\$23.95	\$0.00	\$79.46
	07/01/2024	\$46.76	\$9.95	\$23.95	\$0.00	\$80.66
	01/01/2025	\$47.96	\$9.95	\$23.95	\$0.00	\$81.86

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - GLAZIER - Local 35 Zone 2

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.51	\$9.65	\$0.00	\$0.00	\$32.16
2	55	\$24.76	\$9.65	\$6.55	\$0.00	\$40.96
3	60	\$27.01	\$9.65	\$7.14	\$0.00	\$43.80
4	65	\$29.26	\$9.65	\$7.74	\$0.00	\$46.65
5	70	\$31.51	\$9.65	\$20.13	\$0.00	\$61.29
6	75	\$33.76	\$9.65	\$20.73	\$0.00	\$64.14
7	80	\$36.01	\$9.65	\$21.32	\$0.00	\$66.98
8	90	\$40.51	\$9.65	\$22.51	\$0.00	\$72.67

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.78	\$9.95	\$0.00	\$0.00	\$32.73
2	55	\$25.06	\$9.95	\$6.66	\$0.00	\$41.67
3	60	\$27.34	\$9.95	\$7.26	\$0.00	\$44.55
4	65	\$29.61	\$9.95	\$7.87	\$0.00	\$47.43
5	70	\$31.89	\$9.95	\$20.32	\$0.00	\$62.16
6	75	\$34.17	\$9.95	\$20.93	\$0.00	\$65.05
7	80	\$36.45	\$9.95	\$21.53	\$0.00	\$67.93
8	90	\$41.00	\$9.95	\$22.74	\$0.00	\$73.69

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

HOISTING ENGINEER/CRANES/GRADALLS <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$54.28	\$14.75	\$16.15	\$0.00	\$85.18
	12/01/2023	\$55.53	\$14.75	\$16.15	\$0.00	\$86.43
	06/01/2024	\$56.83	\$14.75	\$16.15	\$0.00	\$87.73
	12/01/2024	\$58.28	\$14.75	\$16.15	\$0.00	\$89.18
	06/01/2025	\$59.58	\$14.75	\$16.15	\$0.00	\$90.48
	12/01/2025	\$61.03	\$14.75	\$16.15	\$0.00	\$91.93
	06/01/2026	\$62.33	\$14.75	\$16.15	\$0.00	\$93.23
	12/01/2026	\$63.78	\$14.75	\$16.15	\$0.00	\$94.68

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - OPERATING ENGINEERS - Local 4

Effective Date - 06/01/2023

Step	percent	Apprentice	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55		\$29.85	\$14.75	\$0.00	\$0.00	\$44.60
2	60		\$32.57	\$14.75	\$16.15	\$0.00	\$63.47
3	65		\$35.28	\$14.75	\$16.15	\$0.00	\$66.18
4	70		\$38.00	\$14.75	\$16.15	\$0.00	\$68.90
5	75		\$40.71	\$14.75	\$16.15	\$0.00	\$71.61
6	80		\$43.42	\$14.75	\$16.15	\$0.00	\$74.32
7	85		\$46.14	\$14.75	\$16.15	\$0.00	\$77.04
8	90		\$48.85	\$14.75	\$16.15	\$0.00	\$79.75

Effective Date - 12/01/2023

Step	percent	Apprentice	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55		\$30.54	\$14.75	\$0.00	\$0.00	\$45.29
2	60		\$33.32	\$14.75	\$16.15	\$0.00	\$64.22
3	65		\$36.09	\$14.75	\$16.15	\$0.00	\$66.99
4	70		\$38.87	\$14.75	\$16.15	\$0.00	\$69.77
5	75		\$41.65	\$14.75	\$16.15	\$0.00	\$72.55
6	80		\$44.42	\$14.75	\$16.15	\$0.00	\$75.32
7	85		\$47.20	\$14.75	\$16.15	\$0.00	\$78.10
8	90		\$49.98	\$14.75	\$16.15	\$0.00	\$80.88

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) SHEETMETAL WORKERS LOCAL 17 - A	02/01/2023	\$55.31	\$14.11	\$26.64	\$2.83	\$98.89
	08/01/2023	\$57.01	\$14.11	\$26.64	\$2.83	\$100.59
	02/01/2024	\$58.71	\$14.11	\$26.64	\$2.83	\$102.29
	08/01/2024	\$60.46	\$14.11	\$26.64	\$2.83	\$104.04
	02/01/2025	\$62.21	\$14.11	\$26.64	\$2.83	\$105.79
	08/01/2025	\$64.06	\$14.11	\$26.64	\$2.83	\$107.64
	02/01/2026	\$66.01	\$14.11	\$26.64	\$2.83	\$109.59

For apprentice rates see "Apprentice- SHEET METAL WORKER"

HVAC (ELECTRICAL CONTROLS) ELECTRICIANS LOCAL 103	03/01/2023	\$59.23	\$13.00	\$21.63	\$0.00	\$93.86
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For apprentice rates see "Apprentice- ELECTRICIAN"

HVAC (TESTING AND BALANCING - AIR) SHEETMETAL WORKERS LOCAL 17 - A	02/01/2023	\$55.31	\$14.11	\$26.64	\$2.83	\$98.89
	08/01/2023	\$57.01	\$14.11	\$26.64	\$2.83	\$100.59
	02/01/2024	\$58.71	\$14.11	\$26.64	\$2.83	\$102.29
	08/01/2024	\$60.46	\$14.11	\$26.64	\$2.83	\$104.04
	02/01/2025	\$62.21	\$14.11	\$26.64	\$2.83	\$105.79
	08/01/2025	\$64.06	\$14.11	\$26.64	\$2.83	\$107.64
	02/01/2026	\$66.01	\$14.11	\$26.64	\$2.83	\$109.59

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) <i>PIPEFITTERS LOCAL 537</i>	03/01/2023	\$63.43	\$12.50	\$20.80	\$0.00	\$96.73
	09/01/2023	\$65.18	\$12.50	\$20.80	\$0.00	\$98.48
	03/01/2024	\$66.98	\$12.50	\$20.80	\$0.00	\$100.28
	09/01/2024	\$68.78	\$12.50	\$20.80	\$0.00	\$102.08
	03/01/2025	\$70.58	\$12.50	\$20.80	\$0.00	\$103.88
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC <i>PIPEFITTERS LOCAL 537</i>	03/01/2023	\$63.43	\$12.25	\$20.80	\$0.00	\$96.48
	09/01/2023	\$65.18	\$12.25	\$20.80	\$0.00	\$98.23
	03/01/2024	\$66.98	\$12.25	\$20.80	\$0.00	\$100.03
	09/01/2024	\$68.78	\$12.25	\$20.80	\$0.00	\$101.83
	03/01/2025	\$70.58	\$12.25	\$20.80	\$0.00	\$103.63
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HYDRAULIC DRILLS <i>LABORERS - ZONE 2</i>	06/01/2023	\$38.21	\$9.40	\$16.89	\$0.00	\$64.50
	12/01/2023	\$39.11	\$9.40	\$16.89	\$0.00	\$65.40
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2023	\$38.21	\$9.40	\$16.89	\$0.00	\$64.50
	12/01/2023	\$39.11	\$9.40	\$16.89	\$0.00	\$65.40
	06/01/2024	\$40.44	\$9.40	\$16.89	\$0.00	\$66.73
	12/01/2024	\$41.77	\$9.40	\$16.89	\$0.00	\$68.06
	06/01/2025	\$43.16	\$9.40	\$16.89	\$0.00	\$69.45
	12/01/2025	\$44.54	\$9.40	\$16.89	\$0.00	\$70.83
	06/01/2026	\$45.98	\$9.40	\$16.89	\$0.00	\$72.27
	12/01/2026	\$47.42	\$9.40	\$16.89	\$0.00	\$73.71
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) <i>HEAT & FROST INSULATORS LOCAL 6 (BOSTON)</i>	09/01/2022	\$53.85	\$13.80	\$17.14	\$0.00	\$84.79

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

Effective Date - 09/01/2022

Step	percent	Apprentice	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50		\$26.93	\$13.80	\$12.42	\$0.00	\$53.15
2	60		\$32.31	\$13.80	\$13.36	\$0.00	\$59.47
3	70		\$37.70	\$13.80	\$14.31	\$0.00	\$65.81
4	80		\$43.08	\$13.80	\$15.25	\$0.00	\$72.13

Notes:

Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER <i>IRONWORKERS LOCAL 7 (WORCESTER AREA)</i>	03/16/2023	\$52.42	\$8.35	\$26.70	\$0.00	\$87.47
	03/16/2024	\$53.67	\$8.35	\$26.70	\$0.00	\$88.72

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - IRONWORKER - Local 7 Worcester

Effective Date - 03/16/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$31.45	\$8.35	\$26.70	\$0.00	\$66.50
2	70	\$36.69	\$8.35	\$26.70	\$0.00	\$71.74
3	75	\$39.32	\$8.35	\$26.70	\$0.00	\$74.37
4	80	\$41.94	\$8.35	\$26.70	\$0.00	\$76.99
5	85	\$44.56	\$8.35	\$26.70	\$0.00	\$79.61
6	90	\$47.18	\$8.35	\$26.70	\$0.00	\$82.23

Effective Date - 03/16/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$32.20	\$8.35	\$26.70	\$0.00	\$67.25
2	70	\$37.57	\$8.35	\$26.70	\$0.00	\$72.62
3	75	\$40.25	\$8.35	\$26.70	\$0.00	\$75.30
4	80	\$42.94	\$8.35	\$26.70	\$0.00	\$77.99
5	85	\$45.62	\$8.35	\$26.70	\$0.00	\$80.67
6	90	\$48.30	\$8.35	\$26.70	\$0.00	\$83.35

Notes:

Apprentice to Journeyworker Ratio:1:4

JACKHAMMER & PAVING BREAKER OPERATOR LABORERS - ZONE 2	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
LABORER LABORERS - ZONE 2	06/01/2023	\$37.46	\$9.40	\$16.89	\$0.00	\$63.75
	12/01/2023	\$38.36	\$9.40	\$16.89	\$0.00	\$64.65

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - LABORER - Zone 2

Effective Date - 06/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$22.48	\$9.40	\$16.89	\$0.00	\$48.77
2	70	\$26.22	\$9.40	\$16.89	\$0.00	\$52.51
3	80	\$29.97	\$9.40	\$16.89	\$0.00	\$56.26
4	90	\$33.71	\$9.40	\$16.89	\$0.00	\$60.00

Effective Date - 12/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.02	\$9.40	\$16.89	\$0.00	\$49.31
2	70	\$26.85	\$9.40	\$16.89	\$0.00	\$53.14
3	80	\$30.69	\$9.40	\$16.89	\$0.00	\$56.98
4	90	\$34.52	\$9.40	\$16.89	\$0.00	\$60.81

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER (HEAVY & HIGHWAY)	06/01/2023	\$37.46	\$9.40	\$16.89	\$0.00	\$63.75
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2023	\$38.36	\$9.40	\$16.89	\$0.00	\$64.65
	06/01/2024	\$39.69	\$9.40	\$16.89	\$0.00	\$65.98
	12/01/2024	\$41.02	\$9.40	\$16.89	\$0.00	\$67.31
	06/01/2025	\$42.41	\$9.40	\$16.89	\$0.00	\$68.70
	12/01/2025	\$43.79	\$9.40	\$16.89	\$0.00	\$70.08
	06/01/2026	\$45.23	\$9.40	\$16.89	\$0.00	\$71.52
	12/01/2026	\$46.67	\$9.40	\$16.89	\$0.00	\$72.96

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - LABORER (Heavy & Highway) - Zone 2

Effective Date - 06/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$22.48	\$9.40	\$16.89	\$0.00	\$48.77
2	70	\$26.22	\$9.40	\$16.89	\$0.00	\$52.51
3	80	\$29.97	\$9.40	\$16.89	\$0.00	\$56.26
4	90	\$33.71	\$9.40	\$16.89	\$0.00	\$60.00

Effective Date - 12/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	\$23.02	\$9.40	\$16.89	\$0.00	\$49.31
2	70	\$26.85	\$9.40	\$16.89	\$0.00	\$53.14
3	80	\$30.69	\$9.40	\$16.89	\$0.00	\$56.98
4	90	\$34.52	\$9.40	\$16.89	\$0.00	\$60.81

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER: CARPENTER TENDER LABORERS - ZONE 2	06/01/2023	\$37.46	\$9.40	\$16.89	\$0.00	\$63.75
For apprentice rates see "Apprentice- LABORER"	12/01/2023	\$38.36	\$9.40	\$16.89	\$0.00	\$64.65
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LABORER: CEMENT FINISHER TENDER LABORERS - ZONE 2	06/01/2023	\$37.46	\$9.40	\$16.89	\$0.00	\$63.75
For apprentice rates see "Apprentice- LABORER"	12/01/2023	\$38.36	\$9.40	\$16.89	\$0.00	\$64.65
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LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER LABORERS - ZONE 2	06/01/2023	\$37.55	\$9.40	\$16.95	\$0.00	\$63.90
For apprentice rates see "Apprentice- LABORER"	12/01/2023	\$38.45	\$9.40	\$16.95	\$0.00	\$64.80
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LABORER: MASON TENDER LABORERS - ZONE 2	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
For apprentice rates see "Apprentice- LABORER"	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
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LABORER: MASON TENDER (HEAVY & HIGHWAY) LABORERS - ZONE 2 (HEAVY & HIGHWAY)	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
06/01/2024	\$39.94	\$9.40	\$16.89	\$0.00	\$66.23	
12/01/2024	\$41.27	\$9.40	\$16.89	\$0.00	\$67.56	
06/01/2025	\$42.66	\$9.40	\$16.89	\$0.00	\$68.95	
12/01/2025	\$44.04	\$9.40	\$16.89	\$0.00	\$70.33	
06/01/2026	\$45.48	\$9.40	\$16.89	\$0.00	\$71.77	
12/01/2026	\$46.92	\$9.40	\$16.89	\$0.00	\$73.21	
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LABORER: MULTI-TRADE TENDER LABORERS - ZONE 2	06/01/2023	\$37.46	\$9.40	\$16.89	\$0.00	\$63.75
For apprentice rates see "Apprentice- LABORER"	12/01/2023	\$38.36	\$9.40	\$16.89	\$0.00	\$64.65
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LABORER: TREE REMOVER LABORERS - ZONE 2	06/01/2023	\$37.46	\$9.40	\$16.89	\$0.00	\$63.75
For apprentice rates see "Apprentice- LABORER"	12/01/2023	\$38.36	\$9.40	\$16.89	\$0.00	\$64.65

This classification applies to the removal of standing trees, and the trimming and removal of branches and limbs when related to public works construction or site clearance incidental to construction . For apprentice rates see "Apprentice- LABORER"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LASER BEAM OPERATOR	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
LABORERS - ZONE 2	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY)	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
	06/01/2024	\$39.94	\$9.40	\$16.89	\$0.00	\$66.23
	12/01/2024	\$41.27	\$9.40	\$16.89	\$0.00	\$67.56
	06/01/2025	\$42.66	\$9.40	\$16.89	\$0.00	\$68.95
	12/01/2025	\$44.04	\$9.40	\$16.89	\$0.00	\$70.33
	06/01/2026	\$45.48	\$9.40	\$16.89	\$0.00	\$71.77
	12/01/2026	\$46.92	\$9.40	\$16.89	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS	02/01/2023	\$46.25	\$11.49	\$20.37	\$0.00	\$78.11
BRICKLAYERS LOCAL 3 - MARBLE & TILE	08/01/2023	\$47.89	\$11.49	\$20.37	\$0.00	\$79.75
	02/01/2024	\$48.89	\$11.49	\$20.37	\$0.00	\$80.75
	08/01/2024	\$50.57	\$11.49	\$20.37	\$0.00	\$82.43
	02/01/2025	\$51.61	\$11.49	\$20.37	\$0.00	\$83.47
	08/01/2025	\$53.33	\$11.49	\$20.37	\$0.00	\$85.19
	02/01/2026	\$54.41	\$11.49	\$20.37	\$0.00	\$86.27
	08/01/2026	\$56.17	\$11.49	\$20.37	\$0.00	\$88.03
	02/01/2027	\$57.29	\$11.49	\$20.37	\$0.00	\$89.15

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

Effective Date - 02/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.13	\$11.49	\$20.37	\$0.00	\$54.99
2	60	\$27.75	\$11.49	\$20.37	\$0.00	\$59.61
3	70	\$32.38	\$11.49	\$20.37	\$0.00	\$64.24
4	80	\$37.00	\$11.49	\$20.37	\$0.00	\$68.86
5	90	\$41.63	\$11.49	\$20.37	\$0.00	\$73.49

Effective Date - 08/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.95	\$11.49	\$20.37	\$0.00	\$55.81
2	60	\$28.73	\$11.49	\$20.37	\$0.00	\$60.59
3	70	\$33.52	\$11.49	\$20.37	\$0.00	\$65.38
4	80	\$38.31	\$11.49	\$20.37	\$0.00	\$70.17
5	90	\$43.10	\$11.49	\$20.37	\$0.00	\$74.96

Notes:

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
MARBLE MASONS, TILELAYERS & TERRAZZO MECH <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2023	\$60.37	\$11.49	\$22.31	\$0.00	\$94.17
	08/01/2023	\$62.42	\$11.49	\$22.31	\$0.00	\$96.22
	02/01/2024	\$63.67	\$11.49	\$22.31	\$0.00	\$97.47
	08/01/2024	\$65.77	\$11.49	\$22.31	\$0.00	\$99.57
	02/01/2025	\$67.07	\$11.49	\$22.31	\$0.00	\$100.87
	08/01/2025	\$69.22	\$11.49	\$22.31	\$0.00	\$103.02
	02/01/2026	\$70.57	\$11.49	\$22.31	\$0.00	\$104.37
	08/01/2026	\$72.77	\$11.49	\$22.31	\$0.00	\$106.57
	02/01/2027	\$74.17	\$11.49	\$22.31	\$0.00	\$107.97

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

Effective Date - 02/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.19	\$11.49	\$22.31	\$0.00	\$63.99
2	60	\$36.22	\$11.49	\$22.31	\$0.00	\$70.02
3	70	\$42.26	\$11.49	\$22.31	\$0.00	\$76.06
4	80	\$48.30	\$11.49	\$22.31	\$0.00	\$82.10
5	90	\$54.33	\$11.49	\$22.31	\$0.00	\$88.13

Effective Date - 08/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$31.21	\$11.49	\$22.31	\$0.00	\$65.01
2	60	\$37.45	\$11.49	\$22.31	\$0.00	\$71.25
3	70	\$43.69	\$11.49	\$22.31	\$0.00	\$77.49
4	80	\$49.94	\$11.49	\$22.31	\$0.00	\$83.74
5	90	\$56.18	\$11.49	\$22.31	\$0.00	\$89.98

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$53.69	\$14.75	\$16.15	\$0.00	\$84.59
	12/01/2023	\$54.93	\$14.75	\$16.15	\$0.00	\$85.83
	06/01/2024	\$56.21	\$14.75	\$16.15	\$0.00	\$87.11
	12/01/2024	\$57.65	\$14.75	\$16.15	\$0.00	\$88.55
	06/01/2025	\$58.93	\$14.75	\$16.15	\$0.00	\$89.83
	12/01/2025	\$60.37	\$14.75	\$16.15	\$0.00	\$91.27
	06/01/2026	\$61.65	\$14.75	\$16.15	\$0.00	\$92.55
	12/01/2026	\$63.09	\$14.75	\$16.15	\$0.00	\$93.99

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
MECHANICS MAINTENANCE <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$53.69	\$14.75	\$16.15	\$0.00	\$84.59
	12/01/2023	\$54.93	\$14.75	\$16.15	\$0.00	\$85.83
	06/01/2024	\$56.21	\$14.75	\$16.15	\$0.00	\$87.11
	12/01/2024	\$57.65	\$14.75	\$16.15	\$0.00	\$88.55
	06/01/2025	\$58.93	\$14.75	\$16.15	\$0.00	\$89.83
	12/01/2025	\$60.37	\$14.75	\$16.15	\$0.00	\$91.27
	06/01/2026	\$61.65	\$14.75	\$16.15	\$0.00	\$92.55
	12/01/2026	\$63.09	\$14.75	\$16.15	\$0.00	\$93.99

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

MILLWRIGHT (Zone 2) <i>MILLWRIGHTS LOCAL 1121 - Zone 2</i>	01/02/2023	\$41.92	\$8.58	\$21.57	\$0.00	\$72.07
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Apprentice - MILLWRIGHT - Local 1121 Zone 2

Effective Date - 01/02/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	\$23.06	\$8.58	\$5.72	\$0.00	\$37.36
2	65	\$27.25	\$8.58	\$17.93	\$0.00	\$53.76
3	75	\$31.44	\$8.58	\$18.98	\$0.00	\$59.00
4	85	\$35.63	\$8.58	\$20.01	\$0.00	\$64.22

Notes: Step 1&2 Appr. indentured after 1/6/2020 receive no pension, but do receive annuity. (Step 1 \$5.72, Step 2 \$6.66)

Steps are 2,000 hours

Apprentice to Journeyworker Ratio:1:4

MORTAR MIXER <i>LABORERS - ZONE 2</i>	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90

For apprentice rates see "Apprentice- LABORER"

OILER (OTHER THAN TRUCK CRANES,GRADALLS) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$24.34	\$14.75	\$16.15	\$0.00	\$55.24
	12/01/2023	\$24.91	\$14.75	\$16.15	\$0.00	\$55.81
	06/01/2024	\$25.51	\$14.75	\$16.15	\$0.00	\$56.41
	12/01/2024	\$26.17	\$14.75	\$16.15	\$0.00	\$57.07
	06/01/2025	\$26.77	\$14.75	\$16.15	\$0.00	\$57.67
	12/01/2025	\$27.43	\$14.75	\$16.15	\$0.00	\$58.33
	06/01/2026	\$28.02	\$14.75	\$16.15	\$0.00	\$58.92
	12/01/2026	\$28.69	\$14.75	\$16.15	\$0.00	\$59.59

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

OILER (TRUCK CRANES, GRADALLS) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$29.67	\$14.75	\$16.15	\$0.00	\$60.57
	12/01/2023	\$30.36	\$14.75	\$16.15	\$0.00	\$61.26
	06/01/2024	\$31.08	\$14.75	\$16.15	\$0.00	\$61.98
	12/01/2024	\$31.88	\$14.75	\$16.15	\$0.00	\$62.78
	06/01/2025	\$32.60	\$14.75	\$16.15	\$0.00	\$63.50
	12/01/2025	\$33.40	\$14.75	\$16.15	\$0.00	\$64.30
	06/01/2026	\$34.12	\$14.75	\$16.15	\$0.00	\$65.02
	12/01/2026	\$34.92	\$14.75	\$16.15	\$0.00	\$65.82

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
OTHER POWER DRIVEN EQUIPMENT - CLASS II <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$53.69	\$14.75	\$16.15	\$0.00	\$84.59
	12/01/2023	\$54.93	\$14.75	\$16.15	\$0.00	\$85.83
	06/01/2024	\$56.21	\$14.75	\$16.15	\$0.00	\$87.11
	12/01/2024	\$57.65	\$14.75	\$16.15	\$0.00	\$88.55
	06/01/2025	\$58.93	\$14.75	\$16.15	\$0.00	\$89.83
	12/01/2025	\$60.37	\$14.75	\$16.15	\$0.00	\$91.27
	06/01/2026	\$61.65	\$14.75	\$16.15	\$0.00	\$92.55
	12/01/2026	\$63.09	\$14.75	\$16.15	\$0.00	\$93.99

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

PAINTER (BRIDGES/TANKS) <i>PAINTERS LOCAL 35 - ZONE 2</i>	07/01/2023	\$55.51	\$9.65	\$23.70	\$0.00	\$88.86
	01/01/2024	\$56.06	\$9.95	\$23.95	\$0.00	\$89.96
	07/01/2024	\$57.26	\$9.95	\$23.95	\$0.00	\$91.16
	01/01/2025	\$58.46	\$9.95	\$23.95	\$0.00	\$92.36

Apprentice - PAINTER Local 35 - BRIDGES/TANKS

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$27.76	\$9.65	\$0.00	\$0.00	\$37.41
2	55	\$30.53	\$9.65	\$6.55	\$0.00	\$46.73
3	60	\$33.31	\$9.65	\$7.14	\$0.00	\$50.10
4	65	\$36.08	\$9.65	\$7.74	\$0.00	\$53.47
5	70	\$38.86	\$9.65	\$20.13	\$0.00	\$68.64
6	75	\$41.63	\$9.65	\$20.73	\$0.00	\$72.01
7	80	\$44.41	\$9.65	\$21.32	\$0.00	\$75.38
8	90	\$49.96	\$9.65	\$22.51	\$0.00	\$82.12

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$28.03	\$9.95	\$0.00	\$0.00	\$37.98
2	55	\$30.83	\$9.95	\$6.66	\$0.00	\$47.44
3	60	\$33.64	\$9.95	\$7.26	\$0.00	\$50.85
4	65	\$36.44	\$9.95	\$7.87	\$0.00	\$54.26
5	70	\$39.24	\$9.95	\$20.32	\$0.00	\$69.51
6	75	\$42.05	\$9.95	\$20.93	\$0.00	\$72.93
7	80	\$44.85	\$9.95	\$21.53	\$0.00	\$76.33
8	90	\$50.45	\$9.95	\$22.74	\$0.00	\$83.14

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) *	07/01/2023	\$46.41	\$9.65	\$23.70	\$0.00	\$79.76
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. <i>PAINTERS LOCAL 35 - ZONE 2</i>	01/01/2024	\$46.96	\$9.95	\$23.95	\$0.00	\$80.86
	07/01/2024	\$48.16	\$9.95	\$23.95	\$0.00	\$82.06
	01/01/2025	\$49.36	\$9.95	\$23.95	\$0.00	\$83.26

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - New

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.21	\$9.65	\$0.00	\$0.00	\$32.86
2	55	\$25.53	\$9.65	\$6.55	\$0.00	\$41.73
3	60	\$27.85	\$9.65	\$7.14	\$0.00	\$44.64
4	65	\$30.17	\$9.65	\$7.74	\$0.00	\$47.56
5	70	\$32.49	\$9.65	\$20.13	\$0.00	\$62.27
6	75	\$34.81	\$9.65	\$20.73	\$0.00	\$65.19
7	80	\$37.13	\$9.65	\$21.32	\$0.00	\$68.10
8	90	\$41.77	\$8.65	\$22.51	\$0.00	\$72.93

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$23.48	\$9.95	\$0.00	\$0.00	\$33.43
2	55	\$25.83	\$9.95	\$6.66	\$0.00	\$42.44
3	60	\$28.18	\$9.95	\$7.26	\$0.00	\$45.39
4	65	\$30.52	\$9.95	\$7.87	\$0.00	\$48.34
5	70	\$32.87	\$9.95	\$20.32	\$0.00	\$63.14
6	75	\$35.22	\$9.95	\$20.93	\$0.00	\$66.10
7	80	\$37.57	\$9.95	\$21.53	\$0.00	\$69.05
8	90	\$42.26	\$9.95	\$22.74	\$0.00	\$74.95

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT) PAINTERS LOCAL 35 - ZONE 2	07/01/2023	\$44.47	\$9.65	\$23.70	\$0.00	\$77.82
	01/01/2024	\$45.02	\$9.95	\$23.95	\$0.00	\$78.92
	07/01/2024	\$46.22	\$9.95	\$23.95	\$0.00	\$80.12
	01/01/2025	\$47.42	\$9.95	\$23.95	\$0.00	\$81.32

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - PAINTER Local 35 Zone 2 - Spray/Sandblast - Repaint

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.24	\$9.65	\$0.00	\$0.00	\$31.89
2	55	\$24.46	\$9.65	\$6.55	\$0.00	\$40.66
3	60	\$26.68	\$9.65	\$7.14	\$0.00	\$43.47
4	65	\$28.91	\$9.65	\$7.74	\$0.00	\$46.30
5	70	\$31.13	\$9.65	\$20.13	\$0.00	\$60.91
6	75	\$33.35	\$9.65	\$20.73	\$0.00	\$63.73
7	80	\$35.58	\$9.65	\$21.32	\$0.00	\$66.55
8	90	\$40.02	\$9.65	\$22.51	\$0.00	\$72.18

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.51	\$9.95	\$0.00	\$0.00	\$32.46
2	55	\$24.76	\$9.95	\$6.66	\$0.00	\$41.37
3	60	\$27.01	\$9.95	\$7.26	\$0.00	\$44.22
4	65	\$29.26	\$9.95	\$7.87	\$0.00	\$47.08
5	70	\$31.51	\$9.95	\$20.32	\$0.00	\$61.78
6	75	\$33.77	\$9.95	\$20.93	\$0.00	\$64.65
7	80	\$36.02	\$9.95	\$21.53	\$0.00	\$67.50
8	90	\$40.52	\$9.95	\$22.74	\$0.00	\$73.21

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, NEW) *	07/01/2023	\$45.01	\$9.65	\$23.70	\$0.00	\$78.36
* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used. PAINTERS LOCAL 35 - ZONE 2	01/01/2024	\$45.56	\$9.95	\$23.95	\$0.00	\$79.46
	07/01/2024	\$46.76	\$9.95	\$23.95	\$0.00	\$80.66
	01/01/2025	\$47.96	\$9.95	\$23.95	\$0.00	\$81.86

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - PAINTER - Local 35 Zone 2 - BRUSH NEW

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.51	\$9.65	\$0.00	\$0.00	\$32.16
2	55	\$24.76	\$9.65	\$6.55	\$0.00	\$40.96
3	60	\$27.01	\$9.65	\$7.14	\$0.00	\$43.80
4	65	\$29.26	\$9.65	\$7.74	\$0.00	\$46.65
5	70	\$31.51	\$9.65	\$20.13	\$0.00	\$61.29
6	75	\$33.76	\$9.65	\$20.73	\$0.00	\$64.14
7	80	\$36.01	\$9.65	\$21.32	\$0.00	\$66.98
8	90	\$40.51	\$9.65	\$22.51	\$0.00	\$72.67

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$22.78	\$9.95	\$0.00	\$0.00	\$32.73
2	55	\$25.06	\$9.95	\$6.66	\$0.00	\$41.67
3	60	\$27.34	\$9.95	\$7.26	\$0.00	\$44.55
4	65	\$29.61	\$9.95	\$7.87	\$0.00	\$47.43
5	70	\$31.89	\$9.95	\$20.32	\$0.00	\$62.16
6	75	\$34.17	\$9.95	\$20.93	\$0.00	\$65.05
7	80	\$36.45	\$9.95	\$21.53	\$0.00	\$67.93
8	90	\$41.00	\$9.95	\$22.74	\$0.00	\$73.69

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT) PAINTERS LOCAL 35 - ZONE 2	07/01/2023	\$43.07	\$9.65	\$23.70	\$0.00	\$76.42
	01/01/2024	\$43.62	\$9.95	\$23.95	\$0.00	\$77.52
	07/01/2024	\$44.82	\$9.95	\$23.95	\$0.00	\$78.72
	01/01/2025	\$46.02	\$9.95	\$23.95	\$0.00	\$79.92

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - PAINTER Local 35 Zone 2 - BRUSH REPAINT

Effective Date - 07/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.54	\$9.65	\$0.00	\$0.00	\$31.19
2	55	\$23.69	\$9.65	\$6.27	\$0.00	\$39.61
3	60	\$25.84	\$9.65	\$6.84	\$0.00	\$42.33
4	65	\$28.00	\$9.65	\$7.41	\$0.00	\$45.06
5	70	\$30.15	\$9.65	\$19.78	\$0.00	\$59.58
6	75	\$32.30	\$9.65	\$20.35	\$0.00	\$62.30
7	80	\$34.46	\$9.65	\$20.92	\$0.00	\$65.03
8	90	\$38.76	\$9.65	\$22.06	\$0.00	\$70.47

Effective Date - 01/01/2024

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$21.81	\$9.95	\$0.00	\$0.00	\$31.76
2	55	\$23.99	\$9.95	\$6.66	\$0.00	\$40.60
3	60	\$26.17	\$9.95	\$7.26	\$0.00	\$43.38
4	65	\$28.35	\$9.95	\$7.87	\$0.00	\$46.17
5	70	\$30.53	\$9.95	\$20.32	\$0.00	\$60.80
6	75	\$32.72	\$9.95	\$20.93	\$0.00	\$63.60
7	80	\$34.90	\$9.95	\$21.53	\$0.00	\$66.38
8	90	\$39.26	\$9.95	\$22.74	\$0.00	\$71.95

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY)	06/01/2023	\$37.46	\$9.40	\$16.89	\$0.00	\$63.75
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2023	\$38.36	\$9.40	\$16.89	\$0.00	\$64.65
	06/01/2024	\$39.69	\$9.40	\$16.89	\$0.00	\$65.98
	12/01/2024	\$41.02	\$9.40	\$16.89	\$0.00	\$67.31
	06/01/2025	\$42.41	\$9.40	\$16.89	\$0.00	\$68.70
	12/01/2025	\$43.79	\$9.40	\$16.89	\$0.00	\$70.08
	06/01/2026	\$45.23	\$9.40	\$16.89	\$0.00	\$71.52
	12/01/2026	\$46.67	\$9.40	\$16.89	\$0.00	\$72.96

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

PANEL & PICKUP TRUCKS DRIVER	12/01/2021	\$35.78	\$13.41	\$16.01	\$0.00	\$65.20
TEAMSTERS JOINT COUNCIL NO. 10 ZONE B						

PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK)	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59
PILE DRIVER LOCAL 56 (ZONE 1)						

For apprentice rates see "Apprentice- PILE DRIVER"

PILE DRIVER	08/01/2020	\$49.07	\$9.40	\$23.12	\$0.00	\$81.59
PILE DRIVER LOCAL 56 (ZONE 1)						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - PILE DRIVER - Local 56 Zone 1

Effective Date - 08/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.54	\$9.40	\$23.12	\$0.00	\$57.06
2	60	\$29.44	\$9.40	\$23.12	\$0.00	\$61.96
3	70	\$34.35	\$9.40	\$23.12	\$0.00	\$66.87
4	75	\$36.80	\$9.40	\$23.12	\$0.00	\$69.32
5	80	\$39.26	\$9.40	\$23.12	\$0.00	\$71.78
6	80	\$39.26	\$9.40	\$23.12	\$0.00	\$71.78
7	90	\$44.16	\$9.40	\$23.12	\$0.00	\$76.68
8	90	\$44.16	\$9.40	\$23.12	\$0.00	\$76.68

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 \$34.01/ 3&4 \$41.46/ 5&6 \$62.80/ 7&8 \$69.25

Apprentice to Journeyworker Ratio:1:5

PIPEFITTER & STEAMFITTER PIPEFITTERS LOCAL 537	03/01/2023	\$63.43	\$12.25	\$20.80	\$0.00	\$96.48
	09/01/2023	\$65.18	\$12.25	\$20.80	\$0.00	\$98.23
	03/01/2024	\$66.98	\$12.25	\$20.80	\$0.00	\$100.03
	09/01/2024	\$68.78	\$12.25	\$20.80	\$0.00	\$101.83
	03/01/2025	\$70.58	\$12.25	\$20.80	\$0.00	\$103.63

Apprentice - PIPEFITTER - Local 537

Effective Date - 03/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$25.37	\$12.25	\$8.55	\$0.00	\$46.17
2	45	\$28.54	\$12.25	\$20.80	\$0.00	\$61.59
3	60	\$38.06	\$12.25	\$20.80	\$0.00	\$71.11
4	70	\$44.40	\$12.25	\$20.80	\$0.00	\$77.45
5	80	\$50.74	\$12.25	\$20.80	\$0.00	\$83.79

Effective Date - 09/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	\$26.07	\$12.25	\$8.55	\$0.00	\$46.87
2	45	\$29.33	\$12.25	\$20.80	\$0.00	\$62.38
3	60	\$39.11	\$12.25	\$20.80	\$0.00	\$72.16
4	70	\$45.63	\$12.25	\$20.80	\$0.00	\$78.68
5	80	\$52.14	\$12.25	\$20.80	\$0.00	\$85.19

Notes:

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

Apprentice to Journeyworker Ratio:**

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIPELAYER	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
LABORERS - ZONE 2	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
PIPELAYER (HEAVY & HIGHWAY)	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
LABORERS - ZONE 2 (HEAVY & HIGHWAY)	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
	06/01/2024	\$39.94	\$9.40	\$16.89	\$0.00	\$66.23
	12/01/2024	\$41.27	\$9.40	\$16.89	\$0.00	\$67.56
	06/01/2025	\$42.66	\$9.40	\$16.89	\$0.00	\$68.95
	12/01/2025	\$44.04	\$9.40	\$16.89	\$0.00	\$70.33
	06/01/2026	\$45.48	\$9.40	\$16.89	\$0.00	\$71.77
	12/01/2026	\$46.92	\$9.40	\$16.89	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PLUMBERS & GASFITTERS	02/26/2023	\$64.69	\$14.07	\$18.86	\$0.00	\$97.62
PLUMBERS & GASFITTERS LOCAL 12	09/03/2023	\$66.44	\$14.07	\$18.86	\$0.00	\$99.37
	03/03/2024	\$68.24	\$14.07	\$18.86	\$0.00	\$101.17
	09/01/2024	\$70.04	\$14.07	\$18.86	\$0.00	\$102.97
	03/02/2025	\$71.84	\$14.07	\$18.86	\$0.00	\$104.77

Apprentice - PLUMBER/GASFITTER - Local 12

Effective Date - 02/26/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$22.64	\$14.07	\$6.80	\$0.00	\$43.51
2	40	\$25.88	\$14.07	\$7.72	\$0.00	\$47.67
3	55	\$35.58	\$14.07	\$10.51	\$0.00	\$60.16
4	65	\$42.05	\$14.07	\$12.36	\$0.00	\$68.48
5	75	\$48.52	\$14.07	\$14.22	\$0.00	\$76.81

Effective Date - 09/03/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$23.25	\$14.07	\$6.80	\$0.00	\$44.12
2	40	\$26.58	\$14.07	\$7.72	\$0.00	\$48.37
3	55	\$36.54	\$14.07	\$10.51	\$0.00	\$61.12
4	65	\$43.19	\$14.07	\$12.36	\$0.00	\$69.62
5	75	\$49.83	\$14.07	\$14.22	\$0.00	\$78.12

Notes:

** 1:2; 2:6; 3:10; 4:14; 5:19/Steps are 1 yr

Step4 with lic\$69.00, Step5 with lic\$76.87

Apprentice to Journeyworker Ratio:**

PNEUMATIC CONTROLS (TEMP.)	03/01/2023	\$63.43	\$12.00	\$20.80	\$0.00	\$96.23
PIPEFITTERS LOCAL 537	09/01/2023	\$65.18	\$12.00	\$20.80	\$0.00	\$97.98
	03/01/2024	\$66.98	\$12.00	\$20.80	\$0.00	\$99.78
	09/01/2024	\$68.78	\$12.00	\$20.80	\$0.00	\$101.58
	03/01/2025	\$70.58	\$12.00	\$20.80	\$0.00	\$103.38

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PNEUMATIC DRILL/TOOL OPERATOR <i>LABORERS - ZONE 2</i>	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
	06/01/2024	\$39.94	\$9.40	\$16.89	\$0.00	\$66.23
	12/01/2024	\$41.27	\$9.40	\$16.89	\$0.00	\$67.56
	06/01/2025	\$42.66	\$9.40	\$16.89	\$0.00	\$68.95
	12/01/2025	\$44.04	\$9.40	\$16.89	\$0.00	\$70.33
	06/01/2026	\$45.48	\$9.40	\$16.89	\$0.00	\$71.77
	12/01/2026	\$46.92	\$9.40	\$16.89	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
POWDERMAN & BLASTER <i>LABORERS - ZONE 2</i>	06/01/2023	\$38.46	\$9.40	\$16.89	\$0.00	\$64.75
	12/01/2023	\$39.36	\$9.40	\$16.89	\$0.00	\$65.65
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2023	\$38.46	\$9.40	\$16.89	\$0.00	\$64.75
	12/01/2023	\$39.36	\$9.40	\$16.89	\$0.00	\$65.65
	06/01/2024	\$40.69	\$9.40	\$16.89	\$0.00	\$66.98
	12/01/2024	\$42.02	\$9.40	\$16.89	\$0.00	\$68.31
	06/01/2025	\$43.41	\$9.40	\$16.89	\$0.00	\$69.70
	12/01/2025	\$44.79	\$9.40	\$16.89	\$0.00	\$71.08
	06/01/2026	\$46.23	\$9.40	\$16.89	\$0.00	\$72.52
	12/01/2026	\$47.67	\$9.40	\$16.89	\$0.00	\$73.96
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
POWER SHOVEL/DERRICK/TRENCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$54.28	\$14.75	\$16.15	\$0.00	\$85.18
	12/01/2023	\$55.53	\$14.75	\$16.15	\$0.00	\$86.43
	06/01/2024	\$56.83	\$14.75	\$16.15	\$0.00	\$87.73
	12/01/2024	\$58.28	\$14.75	\$16.15	\$0.00	\$89.18
	06/01/2025	\$59.58	\$14.75	\$16.15	\$0.00	\$90.48
	12/01/2025	\$61.03	\$14.75	\$16.15	\$0.00	\$91.93
	06/01/2026	\$62.33	\$14.75	\$16.15	\$0.00	\$93.23
	12/01/2026	\$63.78	\$14.75	\$16.15	\$0.00	\$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$54.28	\$14.75	\$16.15	\$0.00	\$85.18
	12/01/2023	\$55.53	\$14.75	\$16.15	\$0.00	\$86.43
	06/01/2024	\$56.83	\$14.75	\$16.15	\$0.00	\$87.73
	12/01/2024	\$58.28	\$14.75	\$16.15	\$0.00	\$89.18
	06/01/2025	\$59.58	\$14.75	\$16.15	\$0.00	\$90.48
	12/01/2025	\$61.03	\$14.75	\$16.15	\$0.00	\$91.93
	06/01/2026	\$62.33	\$14.75	\$16.15	\$0.00	\$93.23
	12/01/2026	\$63.78	\$14.75	\$16.15	\$0.00	\$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PUMP OPERATOR (DEWATERING, OTHER) <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$35.30	\$14.75	\$16.15	\$0.00	\$66.20
	12/01/2023	\$36.12	\$14.75	\$16.15	\$0.00	\$67.02
	06/01/2024	\$36.97	\$14.75	\$16.15	\$0.00	\$67.87
	12/01/2024	\$37.92	\$14.75	\$16.15	\$0.00	\$68.82
	06/01/2025	\$38.77	\$14.75	\$16.15	\$0.00	\$69.67
	12/01/2025	\$39.72	\$14.75	\$16.15	\$0.00	\$70.62
	06/01/2026	\$40.58	\$14.75	\$16.15	\$0.00	\$71.48
	12/01/2026	\$41.53	\$14.75	\$16.15	\$0.00	\$72.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER <i>TEAMSTERS 170 - J.G. MacLellan (Lowell)</i>	05/01/2023	\$29.50	\$10.77	\$6.45	\$0.00	\$46.72
	01/01/2024	\$29.50	\$11.17	\$6.45	\$0.00	\$47.12
	05/01/2024	\$30.00	\$11.17	\$6.55	\$0.00	\$47.72
	01/01/2025	\$30.00	\$11.57	\$6.55	\$0.00	\$48.12
	05/01/2025	\$30.50	\$11.57	\$6.65	\$0.00	\$48.72
	01/01/2026	\$30.50	\$11.97	\$6.65	\$0.00	\$49.12
RECLAIMERS <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$53.69	\$14.75	\$16.15	\$0.00	\$84.59
	12/01/2023	\$54.93	\$14.75	\$16.15	\$0.00	\$85.83
	06/01/2024	\$56.21	\$14.75	\$16.15	\$0.00	\$87.11
	12/01/2024	\$57.65	\$14.75	\$16.15	\$0.00	\$88.55
	06/01/2025	\$58.93	\$14.75	\$16.15	\$0.00	\$89.83
	12/01/2025	\$60.37	\$14.75	\$16.15	\$0.00	\$91.27
	06/01/2026	\$61.65	\$14.75	\$16.15	\$0.00	\$92.55
	12/01/2026	\$63.09	\$14.75	\$16.15	\$0.00	\$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR <i>LABORERS - ZONE 2</i>	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$53.69	\$14.75	\$16.15	\$0.00	\$84.59
	12/01/2023	\$54.93	\$14.75	\$16.15	\$0.00	\$85.83
	06/01/2024	\$56.21	\$14.75	\$16.15	\$0.00	\$87.11
	12/01/2024	\$57.65	\$14.75	\$16.15	\$0.00	\$88.55
	06/01/2025	\$58.93	\$14.75	\$16.15	\$0.00	\$89.83
	12/01/2025	\$60.37	\$14.75	\$16.15	\$0.00	\$91.27
	06/01/2026	\$61.65	\$14.75	\$16.15	\$0.00	\$92.55
	12/01/2026	\$63.09	\$14.75	\$16.15	\$0.00	\$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofers Waterproofng &Roofers Damproofng) <i>ROOFERS LOCAL 33</i>	02/01/2023	\$48.53	\$12.78	\$20.20	\$0.00	\$81.51
	08/01/2023	\$50.03	\$12.78	\$20.20	\$0.00	\$83.01
	02/01/2024	\$51.28	\$12.78	\$20.20	\$0.00	\$84.26
	08/01/2024	\$52.78	\$12.78	\$20.20	\$0.00	\$85.76
	02/01/2025	\$54.03	\$12.78	\$20.20	\$0.00	\$87.01
	08/01/2025	\$55.53	\$12.78	\$20.20	\$0.00	\$88.51
	02/01/2026	\$56.78	\$12.78	\$20.20	\$0.00	\$89.76

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - ROOFER - Local 33

Effective Date - 02/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$24.27	\$12.78	\$5.59	\$0.00	\$42.64
2	60	\$29.12	\$12.78	\$20.20	\$0.00	\$62.10
3	65	\$31.54	\$12.78	\$20.20	\$0.00	\$64.52
4	75	\$36.40	\$12.78	\$20.20	\$0.00	\$69.38
5	85	\$41.25	\$12.78	\$20.20	\$0.00	\$74.23

Effective Date - 08/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$25.02	\$12.78	\$5.59	\$0.00	\$43.39
2	60	\$30.02	\$12.78	\$20.20	\$0.00	\$63.00
3	65	\$32.52	\$12.78	\$20.20	\$0.00	\$65.50
4	75	\$37.52	\$12.78	\$20.20	\$0.00	\$70.50
5	85	\$42.53	\$12.78	\$20.20	\$0.00	\$75.51

Notes: ** 1:5, 2:6-10, the 1:10; Reroofing: 1:4, then 1:1

Step 1 is 2000 hrs.; Steps 2-5 are 1000 hrs.

(Hot Pitch Mechanics' receive \$1.00 hr. above ROOFER)

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE <i>ROOFERS LOCAL 33</i>	02/01/2023	\$48.78	\$12.78	\$20.20	\$0.00	\$81.76
	08/01/2023	\$50.28	\$12.78	\$20.20	\$0.00	\$83.26
	02/01/2024	\$51.53	\$12.78	\$20.20	\$0.00	\$84.51
	08/01/2024	\$53.03	\$12.78	\$20.20	\$0.00	\$86.01
	02/01/2025	\$54.28	\$12.78	\$20.20	\$0.00	\$87.26
	08/01/2025	\$55.78	\$12.78	\$20.20	\$0.00	\$88.76
	02/01/2026	\$57.03	\$12.78	\$20.20	\$0.00	\$90.01

For apprentice rates see "Apprentice- ROOFER"

SHEETMETAL WORKER <i>SHEETMETAL WORKERS LOCAL 17 - A</i>	02/01/2023	\$55.31	\$14.11	\$26.64	\$2.83	\$98.89
	08/01/2023	\$57.01	\$14.11	\$26.64	\$2.83	\$100.59
	02/01/2024	\$58.71	\$14.11	\$26.64	\$2.83	\$102.29
	08/01/2024	\$60.46	\$14.11	\$26.64	\$2.83	\$104.04
	02/01/2025	\$62.21	\$14.11	\$26.64	\$2.83	\$105.79
	08/01/2025	\$64.06	\$14.11	\$26.64	\$2.83	\$107.64
	02/01/2026	\$66.01	\$14.11	\$26.64	\$2.83	\$109.59

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - SHEET METAL WORKER - Local 17-A

Effective Date - 02/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	\$23.23	\$14.11	\$6.13	\$0.00	\$43.47
2	42	\$23.23	\$14.11	\$6.13	\$0.00	\$43.47
3	47	\$26.00	\$14.11	\$11.90	\$1.54	\$53.55
4	47	\$26.00	\$14.11	\$11.90	\$1.54	\$53.55
5	52	\$28.76	\$14.11	\$12.88	\$1.65	\$57.40
6	52	\$28.76	\$14.11	\$13.13	\$1.65	\$57.65
7	60	\$33.19	\$14.11	\$14.54	\$1.83	\$63.67
8	65	\$35.95	\$14.11	\$15.52	\$1.94	\$67.52
9	75	\$41.48	\$14.11	\$17.48	\$2.16	\$75.23
10	85	\$47.01	\$14.11	\$18.94	\$2.36	\$82.42

Effective Date - 08/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	42	\$23.94	\$14.11	\$6.13	\$0.00	\$44.18
2	42	\$23.94	\$14.11	\$6.13	\$0.00	\$44.18
3	47	\$26.79	\$14.11	\$11.90	\$1.58	\$54.38
4	47	\$26.79	\$14.11	\$11.90	\$1.58	\$54.38
5	52	\$29.65	\$14.11	\$12.88	\$1.70	\$58.34
6	52	\$29.65	\$14.11	\$13.13	\$1.70	\$58.59
7	60	\$34.21	\$14.11	\$14.54	\$1.89	\$64.75
8	65	\$37.06	\$14.11	\$15.52	\$2.00	\$68.69
9	75	\$42.76	\$14.11	\$17.48	\$2.23	\$76.58
10	85	\$48.46	\$14.11	\$18.94	\$2.45	\$83.96

Notes:

Steps are 6 mos.

Apprentice to Journeyworker Ratio:1:4

SPECIALIZED EARTH MOVING EQUIP < 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/01/2021	\$36.24	\$13.41	\$16.01	\$0.00	\$65.66
SPECIALIZED EARTH MOVING EQUIP > 35 TONS TEAMSTERS JOINT COUNCIL NO. 10 ZONE B	12/01/2021	\$36.53	\$13.41	\$16.01	\$0.00	\$65.95
SPRINKLER FITTER SPRINKLER FITTERS LOCAL 550 - (Section A) Zone 1	03/01/2023	\$66.20	\$10.90	\$23.20	\$0.00	\$100.30
	10/01/2023	\$67.95	\$10.90	\$23.20	\$0.00	\$102.05
	03/01/2024	\$69.75	\$10.90	\$23.20	\$0.00	\$103.85
	10/01/2024	\$71.55	\$10.90	\$23.20	\$0.00	\$105.65
	03/01/2025	\$73.35	\$10.90	\$23.20	\$0.00	\$107.45

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - SPRINKLER FITTER - Local 550 (Section A) Zone 1

Effective Date - 03/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$23.17	\$10.90	\$12.80	\$0.00	\$46.87
2	40	\$26.48	\$10.90	\$13.60	\$0.00	\$50.98
3	45	\$29.79	\$10.90	\$14.40	\$0.00	\$55.09
4	50	\$33.10	\$10.90	\$15.20	\$0.00	\$59.20
5	55	\$36.41	\$10.90	\$16.00	\$0.00	\$63.31
6	60	\$39.72	\$10.90	\$16.80	\$0.00	\$67.42
7	65	\$43.03	\$10.90	\$17.60	\$0.00	\$71.53
8	70	\$46.34	\$10.90	\$18.40	\$0.00	\$75.64
9	75	\$49.65	\$10.90	\$19.20	\$0.00	\$79.75
10	80	\$52.96	\$10.90	\$20.00	\$0.00	\$83.86

Effective Date - 10/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	\$23.78	\$10.90	\$12.80	\$0.00	\$47.48
2	40	\$27.18	\$10.90	\$13.60	\$0.00	\$51.68
3	45	\$30.58	\$10.90	\$14.40	\$0.00	\$55.88
4	50	\$33.98	\$10.90	\$15.20	\$0.00	\$60.08
5	55	\$37.37	\$10.90	\$16.00	\$0.00	\$64.27
6	60	\$40.77	\$10.90	\$16.80	\$0.00	\$68.47
7	65	\$44.17	\$10.90	\$17.60	\$0.00	\$72.67
8	70	\$47.57	\$10.90	\$18.40	\$0.00	\$76.87
9	75	\$50.96	\$10.90	\$19.20	\$0.00	\$81.06
10	80	\$54.36	\$10.90	\$20.00	\$0.00	\$85.26

Notes: Apprentice entered prior 9/30/10:

40/45/50/55/60/65/70/75/80/85

Steps are 850 hours

Apprentice to Journeyworker Ratio:1:3

STEAM BOILER OPERATOR OPERATING ENGINEERS LOCAL 4	06/01/2023	\$53.69	\$14.75	\$16.15	\$0.00	\$84.59
	12/01/2023	\$54.93	\$14.75	\$16.15	\$0.00	\$85.83
	06/01/2024	\$56.21	\$14.75	\$16.15	\$0.00	\$87.11
	12/01/2024	\$57.65	\$14.75	\$16.15	\$0.00	\$88.55
	06/01/2025	\$58.93	\$14.75	\$16.15	\$0.00	\$89.83
	12/01/2025	\$60.37	\$14.75	\$16.15	\$0.00	\$91.27
	06/01/2026	\$61.65	\$14.75	\$16.15	\$0.00	\$92.55
	12/01/2026	\$63.09	\$14.75	\$16.15	\$0.00	\$93.99

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$53.69	\$14.75	\$16.15	\$0.00	\$84.59
	12/01/2023	\$54.93	\$14.75	\$16.15	\$0.00	\$85.83
	06/01/2024	\$56.21	\$14.75	\$16.15	\$0.00	\$87.11
	12/01/2024	\$57.65	\$14.75	\$16.15	\$0.00	\$88.55
	06/01/2025	\$58.93	\$14.75	\$16.15	\$0.00	\$89.83
	12/01/2025	\$60.37	\$14.75	\$16.15	\$0.00	\$91.27
	06/01/2026	\$61.65	\$14.75	\$16.15	\$0.00	\$92.55
	12/01/2026	\$63.09	\$14.75	\$16.15	\$0.00	\$93.99

For apprentice rates see "Apprentice- OPERATING ENGINEERS"

TELECOMMUNICATION TECHNICIAN <i>ELECTRICIANS LOCAL 103</i>	03/01/2023	\$47.38	\$13.00	\$19.63	\$0.00	\$80.01
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Apprentice - TELECOMMUNICATION TECHNICIAN - Local 103

Effective Date - 03/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	45	\$21.32	\$13.00	\$0.65	\$0.00	\$34.97
2	45	\$21.32	\$13.00	\$0.65	\$0.00	\$34.97
3	50	\$23.69	\$13.00	\$15.20	\$0.00	\$51.89
4	50	\$23.69	\$13.00	\$15.20	\$0.00	\$51.89
5	55	\$26.06	\$13.00	\$15.58	\$0.00	\$54.64
6	60	\$28.43	\$13.00	\$15.96	\$0.00	\$57.39
7	65	\$30.80	\$13.00	\$16.34	\$0.00	\$60.14
8	70	\$33.17	\$13.00	\$16.73	\$0.00	\$62.90
9	75	\$35.54	\$13.00	\$17.11	\$0.00	\$65.65
10	80	\$37.90	\$13.00	\$17.48	\$0.00	\$68.38

Notes:

Apprentice to Journeyworker Ratio:1:1

TERRAZZO FINISHERS <i>BRICKLAYERS LOCAL 3 - MARBLE & TILE</i>	02/01/2023	\$59.29	\$11.49	\$22.34	\$0.00	\$93.12
	08/01/2023	\$61.34	\$11.49	\$22.34	\$0.00	\$95.17
	02/01/2024	\$62.59	\$11.49	\$22.34	\$0.00	\$96.42
	08/01/2024	\$64.69	\$11.49	\$22.34	\$0.00	\$98.52
	02/01/2025	\$65.99	\$11.49	\$22.34	\$0.00	\$99.82
	08/01/2025	\$68.14	\$11.49	\$22.34	\$0.00	\$101.97
	02/01/2026	\$69.49	\$11.49	\$22.34	\$0.00	\$103.32
	08/01/2026	\$71.69	\$11.49	\$22.34	\$0.00	\$105.52
	02/01/2027	\$73.09	\$11.49	\$22.34	\$0.00	\$106.92

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Apprentice - TERRAZZO FINISHER - Local 3 Marble & Tile

Effective Date - 02/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$29.65	\$11.49	\$22.34	\$0.00	\$63.48
2	60	\$35.57	\$11.49	\$22.34	\$0.00	\$69.40
3	70	\$41.50	\$11.49	\$22.34	\$0.00	\$75.33
4	80	\$47.43	\$11.49	\$22.34	\$0.00	\$81.26
5	90	\$53.36	\$11.49	\$22.34	\$0.00	\$87.19

Effective Date - 08/01/2023

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	\$30.67	\$11.49	\$22.34	\$0.00	\$64.50
2	60	\$36.80	\$11.49	\$22.34	\$0.00	\$70.63
3	70	\$42.94	\$11.49	\$22.34	\$0.00	\$76.77
4	80	\$49.07	\$11.49	\$22.34	\$0.00	\$82.90
5	90	\$55.21	\$11.49	\$22.34	\$0.00	\$89.04

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2023	\$47.58	\$9.40	\$17.97	\$0.00	\$74.95
	12/01/2023	\$48.83	\$9.40	\$17.97	\$0.00	\$76.20
	06/01/2024	\$50.31	\$9.40	\$17.97	\$0.00	\$77.68
	12/01/2024	\$51.78	\$9.40	\$17.97	\$0.00	\$79.15
	06/01/2025	\$53.28	\$9.40	\$17.97	\$0.00	\$80.65
	12/01/2025	\$54.78	\$9.40	\$17.97	\$0.00	\$82.15
	06/01/2026	\$56.33	\$9.40	\$17.97	\$0.00	\$83.70
	12/01/2026	\$57.83	\$9.40	\$17.97	\$0.00	\$85.20

For apprentice rates see "Apprentice- LABORER"

TEST BORING DRILLER HELPER <i>LABORERS - FOUNDATION AND MARINE</i>	06/01/2023	\$43.70	\$9.40	\$17.97	\$0.00	\$71.07
	12/01/2023	\$44.95	\$9.40	\$17.97	\$0.00	\$72.32
	06/01/2024	\$46.43	\$9.40	\$17.97	\$0.00	\$73.80
	12/01/2024	\$47.90	\$9.40	\$17.97	\$0.00	\$75.27
	06/01/2025	\$49.40	\$9.40	\$17.97	\$0.00	\$76.77
	12/01/2025	\$50.90	\$9.40	\$17.97	\$0.00	\$78.27
	06/01/2026	\$52.45	\$9.40	\$17.97	\$0.00	\$79.82
	12/01/2026	\$53.95	\$9.40	\$17.97	\$0.00	\$81.32

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>	06/01/2023	\$43.58	\$9.40	\$17.97	\$0.00	\$70.95
	12/01/2023	\$44.83	\$9.40	\$17.97	\$0.00	\$72.20
	06/01/2024	\$46.31	\$9.40	\$17.97	\$0.00	\$73.68
	12/01/2024	\$47.78	\$9.40	\$17.97	\$0.00	\$75.15
	06/01/2025	\$49.28	\$9.40	\$17.97	\$0.00	\$76.65
	12/01/2025	\$50.78	\$9.40	\$17.97	\$0.00	\$78.15
	06/01/2026	\$52.33	\$9.40	\$17.97	\$0.00	\$79.70
	12/01/2026	\$53.83	\$9.40	\$17.97	\$0.00	\$81.20
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$53.69	\$14.75	\$16.15	\$0.00	\$84.59
	12/01/2023	\$54.93	\$14.75	\$16.15	\$0.00	\$85.83
	06/01/2024	\$56.21	\$14.75	\$16.15	\$0.00	\$87.11
	12/01/2024	\$57.65	\$14.75	\$16.15	\$0.00	\$88.55
	06/01/2025	\$58.93	\$14.75	\$16.15	\$0.00	\$89.83
	12/01/2025	\$60.37	\$14.75	\$16.15	\$0.00	\$91.27
	06/01/2026	\$61.65	\$14.75	\$16.15	\$0.00	\$92.55
	12/01/2026	\$63.09	\$14.75	\$16.15	\$0.00	\$93.99
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2021	\$36.82	\$13.41	\$16.01	\$0.00	\$66.24
TUNNEL WORK - COMPRESSED AIR <i>LABORERS (COMPRESSED AIR)</i>	06/01/2023	\$55.81	\$9.40	\$18.42	\$0.00	\$83.63
	12/01/2023	\$57.06	\$9.40	\$18.42	\$0.00	\$84.88
	06/01/2024	\$58.54	\$9.40	\$18.42	\$0.00	\$86.36
	12/01/2024	\$60.01	\$9.40	\$18.42	\$0.00	\$87.83
	06/01/2025	\$61.51	\$9.40	\$18.42	\$0.00	\$89.33
	12/01/2025	\$63.01	\$9.40	\$18.42	\$0.00	\$90.83
	06/01/2026	\$64.56	\$9.40	\$18.42	\$0.00	\$92.38
	12/01/2026	\$66.06	\$9.40	\$18.42	\$0.00	\$93.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) <i>LABORERS (COMPRESSED AIR)</i>	06/01/2023	\$57.81	\$9.40	\$18.42	\$0.00	\$85.63
	12/01/2023	\$59.06	\$9.40	\$18.42	\$0.00	\$86.88
	06/01/2024	\$60.54	\$9.40	\$18.42	\$0.00	\$88.36
	12/01/2024	\$62.01	\$9.40	\$18.42	\$0.00	\$89.83
	06/01/2025	\$63.51	\$9.40	\$18.42	\$0.00	\$91.33
	12/01/2025	\$65.01	\$9.40	\$18.42	\$0.00	\$92.83
	06/01/2026	\$66.56	\$9.40	\$18.42	\$0.00	\$94.38
	12/01/2026	\$68.06	\$9.40	\$18.42	\$0.00	\$95.88
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR <i>LABORERS (FREE AIR TUNNEL)</i>	06/01/2023	\$47.88	\$9.40	\$18.42	\$0.00	\$75.70
	12/01/2023	\$49.13	\$9.40	\$18.42	\$0.00	\$76.95
	06/01/2024	\$50.61	\$9.40	\$18.42	\$0.00	\$78.43
	12/01/2024	\$52.08	\$9.40	\$18.42	\$0.00	\$79.90
	06/01/2025	\$53.58	\$9.40	\$18.42	\$0.00	\$81.40
	12/01/2025	\$55.08	\$9.40	\$18.42	\$0.00	\$82.90
	06/01/2026	\$56.63	\$9.40	\$18.42	\$0.00	\$84.45
	12/01/2026	\$58.13	\$9.40	\$18.42	\$0.00	\$85.95
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TUNNEL WORK - FREE AIR (HAZ. WASTE) <i>LABORERS (FREE AIR TUNNEL)</i>	06/01/2023	\$49.88	\$9.40	\$18.42	\$0.00	\$77.70
	12/01/2023	\$51.13	\$9.40	\$18.42	\$0.00	\$78.95
	06/01/2024	\$52.61	\$9.40	\$18.42	\$0.00	\$80.43
	12/01/2024	\$54.08	\$9.40	\$18.42	\$0.00	\$81.90
	06/01/2025	\$55.58	\$9.40	\$18.42	\$0.00	\$83.40
	12/01/2025	\$57.08	\$9.40	\$18.42	\$0.00	\$84.90
	06/01/2026	\$58.63	\$9.40	\$18.42	\$0.00	\$86.45
	12/01/2026	\$60.13	\$9.40	\$18.42	\$0.00	\$87.95
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL <i>TEAMSTERS JOINT COUNCIL NO. 10 ZONE B</i>	12/01/2021	\$36.24	\$13.41	\$16.01	\$0.00	\$65.66
WAGON DRILL OPERATOR <i>LABORERS - ZONE 2</i>	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) <i>LABORERS - ZONE 2 (HEAVY & HIGHWAY)</i>	06/01/2023	\$37.71	\$9.40	\$16.89	\$0.00	\$64.00
	12/01/2023	\$38.61	\$9.40	\$16.89	\$0.00	\$64.90
	06/01/2024	\$39.94	\$9.40	\$16.89	\$0.00	\$66.23
	12/01/2024	\$41.27	\$9.40	\$16.89	\$0.00	\$67.56
	06/01/2025	\$42.66	\$9.40	\$16.89	\$0.00	\$68.95
	12/01/2025	\$44.04	\$9.40	\$16.89	\$0.00	\$70.33
	06/01/2026	\$45.48	\$9.40	\$16.89	\$0.00	\$71.77
	12/01/2026	\$46.92	\$9.40	\$16.89	\$0.00	\$73.21
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WASTE WATER PUMP OPERATOR <i>OPERATING ENGINEERS LOCAL 4</i>	06/01/2023	\$54.28	\$14.75	\$16.15	\$0.00	\$85.18
	12/01/2023	\$55.53	\$14.75	\$16.15	\$0.00	\$86.43
	06/01/2024	\$56.83	\$14.75	\$16.15	\$0.00	\$87.73
	12/01/2024	\$58.28	\$14.75	\$16.15	\$0.00	\$89.18
	06/01/2025	\$59.58	\$14.75	\$16.15	\$0.00	\$90.48
	12/01/2025	\$61.03	\$14.75	\$16.15	\$0.00	\$91.93
	06/01/2026	\$62.33	\$14.75	\$16.15	\$0.00	\$93.23
	12/01/2026	\$63.78	\$14.75	\$16.15	\$0.00	\$94.68
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER <i>PLUMBERS & GASFITTERS LOCAL 12</i>	02/26/2023	\$64.69	\$14.07	\$18.86	\$0.00	\$97.62
	09/03/2023	\$66.44	\$14.07	\$18.86	\$0.00	\$99.37
	03/03/2024	\$68.24	\$14.07	\$18.86	\$0.00	\$101.17
	09/01/2024	\$70.04	\$14.07	\$18.86	\$0.00	\$102.97
	03/02/2025	\$71.84	\$14.07	\$18.86	\$0.00	\$104.77
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
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Additional Apprentice Information:

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

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

All steps are six months (1000 hours.)

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

** Multiple ratios are listed in the comment field.

*** APP to JM; 1:1, 2:2, 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.

DIVISION 1 - GENERAL REQUIREMENTS

DIVISION 1 - GENERAL REQUIREMENTS

- 01010 - Summary of Work
- 01025 - Measurement and Payment
- 01026 - Applications for Payment
- 01027 - Change Order Procedures
- 01047 - Dig Safe
- 01067 - Permits
- 01201 - Preconstruction/Project Meetings
- 01300 - Submittals
- 01340 - Shop Drawings, Product Data and Samples
- 01370 - Schedule of Values
- 01400 - Quality Controls
- 01560 - Temporary Controls
- 01567 - Environmental Protection
- 01570 - Traffic Control
- 01620 - Storage and Protection
- 01630 - Product Options and Substitutions
- 01700 - Contract Closeout
- 01701 - Contract Closeout Procedures
- 01712 - Final Cleaning
- 01720 - Project Record Documents

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.01 REQUIREMENTS

- A. Description of Work.
- B. Contract type.
- C. Work sequence.
- D. Use of premises.

1.02 DESCRIPTION OF WORK

- A. Work of this Contract comprises furnishing materials, labor, permitting, installation of a Duplex Pump System at 58 Summer Hill Road to replace existing gravity sewer service with a two-pump system and low-pressure sewer service at 58 Summer Hill Road, including the following:
 - Installation of an E-One Duplex pump system, connection to power supply, and controls;
 - Installation of sewer service appurtenances including a manhole and service lateral gravity and pressure piping;
 - Upgrade of electric service and panelboard.
 - Removal and disposal of ledge/rock, should it be encountered;
 - Abandonment of existing sewer service piping and manhole in place.
 - Restoration of paved and unpaved areas disturbed by construction activities;
 - all other work specified herein and shown on the Drawings and necessary to provide a complete and operating system.

1.03 CONTRACT TYPE

- A. Construct the Work under a lump sum contract with a unit price allowance for ledge/rock removal.

1.04 WORK SEQUENCE

- A. Construct Work to accommodate maintaining existing wastewater flow to the municipal sewer system treatment and solids management systems during construction to maintain treatment flow.
- B. Coordinate Progress Schedule and performance with OWNER during construction in accordance.
- C. Coordinate shutdown of electrical service for upgrade of service and panelboard with OWNER to minimize downtime.
- D. Existing facilities shall remain functional and accessible throughout the Work.

1.05 USE OF PREMISES

- A. Use of premises shall be limited to Work, storage, and access, and shall allow:

1. CONTRACTOR occupancy on OWNER'S property.
2. Normal public use of public property, rights-of-way, etc.
3. Access to private property.

B. Coordinate use of premises with affected parties.

C. Assume full responsibility for protection and safekeeping of products under this Contract.

D. Coordinate with Town to designate staging and storage area.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 PROCEDURES

- A. For lump sum items, the CONTRACTOR shall be paid in accordance with the Schedule of Values on the basis of actual work accepted until the work item is completed. Upon completion of the item, 100% of the lump sum price may be paid, less retained amounts.
- B. All units of measurement shall be applied to the individual items of work as specified and as interpreted by the ENGINEER or OWNER.
- C. No separate payment will be made for any item that is not specifically set forth in the Bid Schedule, and all costs therefor shall be included in the prices named in the Bid Schedule for the various appurtenant items of work.
- D. Payment for the item(s) of the Bid Schedule, as further specified herein, shall include all compensation to be received by the CONTRACTOR for furnishing all tools, equipment, supplies, and manufactured articles, and for all labor, operations, and incidentals appurtenant to the items of work being described, as necessary to complete the various items of the WORK all in accordance with the requirements of the Contract Documents, including all appurtenances thereto, and including all costs of permits and cost of compliance with the regulations of public agencies having jurisdiction, including Safety and Health Requirements of the Occupational Safety and Health Administration of the U.S. Department of Labor (OSHA).

1.02 SCOPE OF PAYMENT

- A. Payments to the CONTRACTOR will be made at the actual lump sum price for work performed and accepted in accordance with the Contract Documents.
- B. The payment of any Application for Payment or of any retained percentage shall not relieve the CONTRACTOR of his obligation to repair or replace any defective parts of the construction or to be responsible for all damage due to such defects during the construction period or the one-year guaranty period.

1.03 PARTIAL PAYMENTS

- A. Partial payments may be made as the Work progresses. All partial invoices and payments shall be subject to correction in the final Application for Payment.

1.04 PAYMENT FOR MATERIAL DELIVERED

- A. When requested by the CONTRACTOR, and at the discretion of the OWNER, payment may be made for all or part of the value of acceptable, non-perishable materials and equipment which are to be incorporated into the Work, which have not been used and which have been delivered to the construction site and placed in storage area acceptable to the OWNER. The Application for Payment shall be accompanied by such data, satisfactory to the OWNER, that will establish the OWNER'S title to the material and equipment and protect the OWNER'S interest therein, including insurance. Each subsequent Application for Payment shall include an affidavit of the CONTRACTOR stating that all previous progress payments received on account of the Work have been applied to discharge in full, all of the CONTRACTOR'S obligations reflected in prior Applications for Payment. The OWNER shall have the right to deduct from the next progress payment, an amount equal to payment for said material and/or equipment if reasonable and

adequate proof is not submitted.

- B. Materials and equipment, when so paid for by the OWNER, shall become the property of the OWNER and in the event of default on the part of the CONTRACTOR, the OWNER may use, or cause to be used, these materials and equipment in the construction of the Work. The CONTRACTOR shall be responsible for any damage to, or loss of, these materials and equipment. The amount paid by the OWNER shall reduce the estimated amounts due the CONTRACTOR as the material is incorporated into the Work.
- C. No partial payment shall be made for fuels, supplies, lumber, false work, or other expendable or temporary materials, or temporary structures of any kind which are not a permanent part of the Contract. In addition, partial payment shall not be made for pipes, fittings, electrical wiring or conduit, fasteners, paint, or stockpiled gravel and topsoil not incorporated into the work.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.01 GENERAL

- A. The items of work required by the General Conditions, Supplemental Conditions, Special Conditions and Division 1 - General Requirements shall not be measured and paid separately, except as expressly indicated therein, but shall be included in the prices bid for each unit and lump sum item.
- B. The payment for various unit price and lump sum items listed below shall include all materials, labor, tools, equipment, and incidental work necessary to complete the item in accordance with the plans and specifications whether or not the particular work is mentioned in the following paragraphs and needed to construct the work as herein specified and as required by the Contract Documents.

3.02 BID ITEM NO. 1 – DUPLEX PUMP SYSTEM INSTALLATION, 58 SUMMER HILL ROAD (ITEM 1)

- A. Measurement: The work under this item includes furnishing all labor, equipment, and materials to complete the installation of a duplex pump system and sewer service, and for all work incidental to the installation, as shown on the drawings and called for in the specifications that is not paid for under other items in the Schedule of Prices.

Measurement shall be based upon the Contractor's approved schedule of values established for all work included in the lump sum item. The work is detailed by plans and specifications and includes complete mobilization, demobilization, maintenance of sewer service flows, installation, testing, start-up, abandonment of existing utilities, and restoration of the site. Measurement for payment will be made based upon work completed as determined and approved by the Owner and/or Engineer, based on the approved schedule of values.

- B. Payment: Payment of the lump sum bid under Item 1 shall be made at the contract lump sum price which shall be full compensation for the item bid. Payment for ledge/rock excavation and removal shall be included with Item 2. Payment for electrical service upgrade shall be included with item 3.

3.03 BID ITEM NO. 2 – LEDGE/ROCK EXCAVATION AND REMOVAL (ITEM 2)

- A. Measurement. The quantity of rock excavation to be paid for under these Items shall be the

number of cubic yards of rock including ledge rock and boulders exceeding one cubic yard in volume, in place, as measured before excavation.

B. Payment. Payment under these Items at the contract unit price per cubic yard shall be full compensation for furnishing all materials, labor, tools, and construction equipment and for performing all work required for placing and compacting crushed stone, including any incidental work and expense as directed by the Engineer.

BID ITEM NO. 3 – ELECTRICAL SERVICE UPGRADE (ITEM 3)

A. Measurement. The work under this item includes furnishing all labor, equipment, and materials to complete the installation of a 200A, 120/240V, 3-wire, 42-circuit panelboard, outdoor NEMA 3R utility meter socket and replacement utility meter, and all conduit/wire and fittings associated with the installation. Additionally, the work under this section also includes securing permits, and filing documents and paying required fees from Eversource for a complete installation.

B. Measurement shall be based upon the Contractor's approved schedule of values established for all work included in the lump sum item. The work is detailed by plans and specifications and includes contacting the serving utility provider, compliance with utility requirements for the work, installation, testing, start-up, and inspection fees. Measurement for payment will be made based upon work completed as determined and approved by the Owner and/or Engineer, based on the approved schedule of values.

C. Payment: Payment of the lump sum bid under Item 3 shall be made at the contract lump sum price which shall be full compensation for the item bid.

END OF SECTION

SECTION 01026

APPLICATIONS FOR PAYMENT

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Procedures for preparation and submittal of Applications for Payment.

1.02 FORMAT

- A. Application for Payment included at the end of this section or alternate form approved by ENGINEER.

- B. For each item, by specification section number and title, provide a column for listing:

1. Item Number.
2. Description of Work.
3. Scheduled Value.
4. Previous Applications.
5. Work in Place.
6. Stored Materials.
7. Authorized Change Orders.
8. Total Work Completed.
9. Materials Stored to Date of Application.
10. Percentage of Completion.
11. Balance to Finish.
12. Retainage.

For specification sections covering more than one production or work item, list each item separately as a sub-listing to the section.

- C. Submit format to be used to ENGINEER for review and approval a minimum of 10 days prior to the first Application for Payment.
- D. For items bid as unit price items, follow bid schedule for listing component items.

1.03 PREPARATION OF APPLICATIONS

- A. Review application with Resident Project Representative (RPR).
- B. Type required information and execute certification by signature of authorized officer.
- C. Submit each payment application to the ENGINEER for approval and submission to OWNER for payment.
- D. Use data on accepted Schedule of Values. Provide dollar value in each column for each line item for portion of Work performed and for stored materials.
- E. List each authorized Change Order as an extension on continuation sheet, listing Change Order number and dollar amount the same as for an original item of Work.

1.04 SUBMITTAL PROCEDURES

- A. Submit six (6) copies of each Application for Payment on a monthly basis at times to be established at the Preconstruction Conference.
- B. Applications for Payment submitted more frequently than on a monthly basis will not be considered.

1.05 SUBSTANTIATING DATA

- A. When ENGINEER requires substantiating information, submit data justifying line-item amounts in question.
- B. Provide one (1) copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.06 PAYMENTS BY OWNER

- A. As provided in DIVISION 0 the OWNER has the right to pay directly subcontractors, laborers, workmen, mechanics, materialmen and furnishers of machinery and parts thereof, equipment, power tools and all supplies, for costs incurred in the furtherance of the performance of this Contract, for which the CONTRACTOR has failed to pay, after written claim to the OWNER.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01027

CHANGE ORDER PROCEDURES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Promptly implement change order procedures.
 - 1. Provide full written data required to evaluate the time and associated costs of changes.
 - 2. Maintain detailed records of work done on a time-and-material basis.
 - 3. Provide full documentation to ENGINEER.

1.02 DEFINITIONS

- A. Change Order: See General Conditions and Supplementary Conditions.
- B. Work Directive Change: A written order to the CONTRACTOR, signed by OWNER and ENGINEER, which amends the Contract Documents as described, and authorizes CONTRACTOR to proceed with a change which affects the Contract Price or the Contract Time, for inclusion in a subsequent Change Order.
- C. Field Order: The ENGINEER may issue, as required, a written order, instructions, or interpretations, signed by ENGINEER making minor changes in the Work not involving a change in Contract Price or Contract Time.

1.03 PRELIMINARY PROCEDURES

- A. OWNER or ENGINEER may initiate changes by submitting a proposal request to CONTRACTOR. Such request is for information only, and is not an instruction to execute the changes, nor to stop Work in progress. Request will include:
 - 1. Detailed description of the change, products, and location of the change in the Project.
 - 2. Supplementary or revised Drawings and Specifications.
 - 3. The projected time span for making the change, and a specific statement as to whether overtime work is, or is not, authorized.
 - 4. A specific period of time during which the requested price will be considered valid.
- B. CONTRACTOR may initiate changes by submitting a written notice to ENGINEER, containing:
 - 1. Description of the proposed changes.
 - 2. Statement of the reason for making the changes.
 - 3. Statement of the effect on the Contract Price and the Contract Time.
 - 4. Statement of the effect on the work of subcontractors or other contractors.

5. Documentation supporting any change in Contract Price and/or Contract Time.

1.04 WORK DIRECTIVE CHANGE

- A. In lieu of proposal request, OWNER and ENGINEER may issue a Work Directive Change ordering the CONTRACTOR to proceed with a change for subsequent inclusion in a Change Order.
- B. The Work Directive Change will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change and will designate the method of determining any change in the Contract Price and/or Contract Time.
- C. OWNER and ENGINEER will sign and date the Work Directive Change as authorization for the CONTRACTOR to proceed with the changes.
- D. CONTRACTOR may sign and date the Work Directive Change to indicate agreement with the terms therein.

1.05 DOCUMENTATION OF PROPOSALS AND CLAIMS

- A. Support each quotation for a lump sum proposal, and for each unit price which has not previously been established, with sufficient substantiating data including labor, equipment, overhead and profit to allow ENGINEER to evaluate the quotation.
- B. On request provide additional data to support time and cost computations:
 1. Labor required.
 2. Equipment required.
 3. Products required.
 - a. Recommended source of purchase and unit cost.
 - b. Quantities required.
 4. Taxes, insurance, and bonds.
 5. Credit for work deleted from Contract, similarly detailed and documented.
 6. Overhead and profit.
 7. Justification for any change in Contract Time. Justification shall include a revised project schedule identifying the impact of the change.
- C. Support each claim for additional costs, and for work done on a time-and-material basis, with documentation as required for a lump-sum proposal, plus additional information:
 1. Name of the OWNER'S authorized agent who ordered the work, and date of the order.
 2. Dates and times work was performed, and by whom.
 3. Time record, summary of hours worked, and hourly rates paid (Certified Payroll).

4. Receipts and invoices for:

- a. Equipment used, listing dates and times of use, and hourly rates.
- b. Products used, listing of quantities and received bills.
- c. Subcontractors' billings and description of work performed.

1.06 PREPARATION OF CHANGE ORDERS

- A. ENGINEER will prepare each Change Order.
- B. Form: Change Order: Form included in Division 0.
- C. Change Order will describe changes in the Work, both additions and deletions, with attachments of revised Contract Documents to define details of the change.
- D. Change Order will provide an accounting of the adjustment in the Contract Price and/or Contract Time.

1.07 LUMP-SUM OR FIXED PRICE CHANGE ORDER

- A. Content of Change Orders will be based on, either:
 1. ENGINEER'S proposal request and CONTRACTOR'S responsive proposal as mutually agreed between OWNER and CONTRACTOR.
 2. CONTRACTOR'S proposal for a change, as recommended by ENGINEER.
- B. OWNER will sign and date the Change Order as authorization for the CONTRACTOR to proceed with the changes.
- C. CONTRACTOR shall sign and date the Change Order to indicate agreement with the terms therein.

1.08 UNIT PRICE CHANGE ORDER

- A. Content of Change Orders will be based on, either:
 1. ENGINEER'S definition of the scope of the required changes.
 2. CONTRACTOR'S proposal for a change, as recommended by ENGINEER.
 3. Measurement of completed work.
- B. The amounts of the unit prices to be:
 1. Those stated in the Agreement.
 2. Those mutually agreed upon between OWNER and CONTRACTOR.
- C. When quantities of each of the items affected by the Change Order can be determined prior to start of the Work:
 1. OWNER will sign and date the Change Order as authorization for CONTRACTOR to proceed with the changes.
 2. CONTRACTOR shall sign and date the Change Order to indicate agreement with the

terms therein.

D. When quantities of the items cannot be determined prior to start of the Work:

1. OWNER and ENGINEER will issue a Work Directive Change directing CONTRACTOR to proceed with the change on the basis of unit prices and will cite the applicable unit prices.
2. At completion of the change, ENGINEER will determine the cost of such work based on the unit prices and quantities used. CONTRACTOR shall submit documentation to establish the number of units of each item and any claims for a change in Contract Time.
3. ENGINEER will sign and date the Change Order to establish the ENGINEER'S recommended change in Contract Price and in Contract Time.
4. OWNER will sign and date the Change Order as authorization.
5. CONTRACTOR shall sign and date the Change Order to indicate agreement with the terms therein.

1.09 TIME AND MATERIAL WORK DIRECTIVE CHANGE AND CHANGE ORDER

- A. OWNER and ENGINEER will issue a Work Directive Change directing CONTRACTOR to proceed with the changes.
- B. At completion of the change, CONTRACTOR shall submit itemized accounting and supporting data as provided in paragraph 1.05 Documentation of Proposals and Claims.
- C. ENGINEER will recommend the allowable cost of such work.
- D. ENGINEER will sign and date the Change Order to establish the ENGINEER'S recommended change in Contract Price and in Contract Time.
- E. OWNER will sign and date the Change Order as authorization.
- F. CONTRACTOR shall sign and date the Change Order to indicate their agreement therewith.

1.10 CORRELATION WITH CONTRACTOR'S SUBMITTALS

- A. Periodically revise Schedule of Values and Request for Payment forms to record each change as a separate item of Work, and to record the adjusted Contract Price.
- B. Periodically revise the Construction Schedule to reflect each change in Contract Time. Revise sub-schedules to show changes for other items of work affected by the changes.
- C. Upon completion of work under a Change Order, enter pertinent changes in Record Documents.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01047

DIG SAFE

PART 1 GENERAL

1.01 DESCRIPTION

- A. Comply with all regulations and laws concerning excavation, demolition, or explosive work and be advised of "Dig Safe" requirements.

1.02 DIG SAFE

- A. Within the Commonwealth, "Dig-Safe" is the name of the Utility Underground Plant Damage Prevention Authority. They are located at 11 Upton Drive, Wilmington, MA 01887. This phone number is 811 or 888-DIG-SAFE.
- B. Contractors must notify "Dig-Safe" of contemplated excavation, demolition, or explosive work in public or private ways, and any Utility Company Right of Way or Easement.
- C. This notification must be made at least 72 hours prior to the work, but not more than sixty days before the contemplated work. Such notice shall set forth the name of the street or the route number of said way and an accurate description of the location and nature of the proposed work.
- D. "Dig-Safe" is required to respond to the notice within 72 hours from the time said notice is received by designating at the locus the location of pipes, mains, wires, or conduits.
- E. Contractor shall not commence work until "Dig-Safe" has responded as noted above. The work shall then be performed in such a manner, and with reasonable precautions taken to avoid damage to utilities under the surface in said areas of work.

END OF SECTION

SECTION 01067

PERMITS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. The Contractor shall be responsible for obtaining permits specified under Section 00700 GENERAL CONDITIONS, Paragraph 6.13.

1.02 ROAD OPENING PERMIT

- A. Road Opening Permit is required by the Town of Maynard for this project. The Contractor shall obtain the permits and will pay all fees associated with the Permit. The Contractor shall perform all Work in accordance with the conditions of the Permit.

END OF SECTION

SECTION 01201

PRECONSTRUCTION/PROJECT MEETINGS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. CONTRACTOR participation in preconstruction conferences.
- B. CONTRACTOR participation in progress meetings.

1.02 PRECONSTRUCTION CONFERENCE

- A. ENGINEER will schedule preconstruction conference within fifteen (15) days after Notice of Award.
- B. Attendance: OWNER, ENGINEER, state and/or federal agency representatives, local authorities, suppliers/manufacturers, Subcontractors and CONTRACTOR.
- C. Agenda:

1. Submittal of executed bonds and insurance certificates.
2. Execution of Contract.
3. Distribution of Contract Documents.
4. Submittal of list of subcontractors, list of products proposed for installation (in accordance with Section 01300), schedule of values, and progress schedule.
5. Designation of responsible personnel.
6. Submittal of list of products proposed for substitution.
7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal requests, change orders, and Contract closeout procedures.
8. Certified payroll requirements for CONTRACTOR and Subcontractors.
9. Scheduling and critical work sequencing.
10. Coordination with other contracts and/or work.
11. Use of premises by OWNER and CONTRACTOR.
12. Construction facilities and controls provided by CONTRACTOR.
13. Construction facilities and controls provided by OWNER.
14. Temporary utilities provided by OWNER.
15. Field engineering.

16. Major equipment deliveries and priorities.
17. Project inspection.
18. Labor requirements.
19. Requirements of railroads, highway departments, other agencies and utility companies.
20. Rights-of-way and easements.
21. Winter maintenance.
22. Security and housekeeping procedures.
23. Payments to CONTRACTOR.
24. Procedures for testing.
25. Procedures for maintaining record documents.
26. Requirements for start-up of equipment.
27. Inspection and acceptance of equipment put into service during construction period.
28. Substantial completion of Work.
29. Final completion of Work.

1.03 PROGRESS MEETINGS

- A. ENGINEER will schedule and administer progress meetings at least once per month throughout progress of the Work.
- B. ENGINEER will make physical arrangements for meetings, prepare agenda, notify CONTRACTOR as to whether Subcontractor's or supplier's representatives should attend, preside at meetings, record minutes, and distribute copies of minutes to participants within two (2) weeks after meeting.
- C. Attendance: CONTRACTOR'S Superintendent or authorized representative, representatives of major subcontractors and suppliers; ENGINEER; and other representatives as appropriate to agenda topics for each meeting.
- D. Tentative Agenda:
 1. Review of Work progress.
 2. Review of progress schedule.
 3. Delivery schedules.
 4. Submittals.
 5. Pending changes and substitutions.
 6. Payrolls.

7. Subcontractor's progress.
8. Other items affecting progress of Work.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included:

1. Wherever possible throughout the Contract Documents, the minimum acceptable quality of workmanship and materials has been defined either by manufacturer's name and catalog number or by reference to recognized industry standards.
2. To ensure that the specified products are furnished and installed in accordance with design intent, procedures have been established for advance submittal of design data and for its review and approval or rejection by the Engineer.

B. Related work described elsewhere:

1. Contractual requirement for submittals - General Conditions and Supplementary Conditions.
2. Individual submittals required - Pertinent sections of these Specifications.

1.02 PRODUCT HANDLING

Make all submittals of Shop Drawings, samples, requests for substitutions and other items in strict accordance with the provisions of this Section of these Specifications.

PART 2 PRODUCTS

2.01 SHOP DRAWINGS

A. The Contractor shall submit promptly in accordance with an approved construction schedule to avoid delay in his work, or that of any subcontractor, an electronic copy of all shop, detail or working drawings, production data and certificates required for the work, and the Engineer shall review them noting comments. If required, the Contractor shall make corrections and resubmit an electronic corrected copy for final review. The Contractor shall direct specific attention in writing or on resubmitted drawings, data or certificates, to revisions other than those requested by the Engineer on previous submittals. A third submission from the same manufacturer will not be accepted.

B. Electronic submittals shall be in PDF format conforming to the following requirements:

1. PDF Version and Format: Adobe Version PDF 1.7 (ISO 32000-1), PDF/A-2b
2. Resolution: 300 DPI or higher
3. Color: Same as original document
4. File Image: Text Searchable
5. Reproducibility: PDF file shall provide a true copy of the original that contains all details of the document from which it was made.
6. Engineering Plans: PDF page size shall be the same size as the original printed

engineering drawing document.

- C. Each letter of transmittal shall identify each item transmitted by title, drawing number, revision number and date.
- D. The Engineer's review of such drawings, data or certificates shall not relieve the Contractor from responsibility for deviations from the Drawings or Specifications, unless he had in writing called the Engineer's attention to such deviations at the time of submission, and unless the Engineer shall have issued a written waiver of the pertinent Specification, nor shall it relieve him from responsibility for errors of any sort in shop drawings.
- E. Prior to the submission of shop drawings to the Engineer for review, the Contractor shall thoroughly examine the details and check all dimensions and verify all field dimensions. The Contractor shall be fully responsible for the accuracy, proper fit, and coordination of all parts of the work. The Contractor shall stamp each submission with a rubber stamp stating that he has examined and checked the submission as above and shall date and sign each. By stamping, signing, dating and submitting shop, detail and working drawings, data and certificates, the Contractor thereby represents that he has determined and verified all field measurements, field construction criteria, materials, catalog numbers and similar data, and that he has thoroughly checked and coordinated each shop drawing and sample with the requirements of the work and of the Contract Documents. Any submission which, upon examination by the Engineer, shows evidence of not having been thoroughly checked, or not in compliance with the provisions of this Section, will be returned to the Contractor for completion before it will be considered for review.
- F. The Engineer generally will not check dimensions, quantities or schedules, except in cases where the information is lacking on the Drawings or in the Specifications.
- G. The Engineer's approval of a separate item shall not indicate approval of any assembly in which the item functions.
- H. Approval of drawings, data and certificates does not exempt the Contractor from the ultimate responsibility of providing, completely installed, safe, reliable, functioning systems as defined in this Contract.

2.02 MANUFACTURER'S CERTIFICATIONS

- A. For pipe, cement, steel reinforcement, paint and similar materials which are normally tested in the shop by the manufacturer, furnish the Engineer certified records of physical, chemical and other pertinent tests and/or certified statements from the manufacturer that the materials have been manufactured and tested in conformity with the specifications. Where such a small quantity of material is required as to make physical tests or chemical analyses impractical, a certificate from the manufacturer stating the results of such tests or analyses of similar materials which were concurrently produced, may, at the discretion of the Engineer, be considered as the basis for the acceptance of such materials.
- B. Each manufacturer's certificate shall be endorsed or accompanied by the Contractor's certificate that the material certified by the manufacturer will be the material incorporated in the work.

2.03 SAMPLES

- A. Samples as required by the Specifications shall be submitted after the award of the Contract, to the Engineer at the site. No materials for which samples are required shall be delivered to the site for use until representative samples of same have been approved in writing by the Engineer. Such samples shall be furnished by the Contractor without charge.

B. The Engineer may inspect the material at the source. If approved, such approval shall not preclude a future withdrawal if the material fails to meet the Specifications.

2.04 SUBSTITUTIONS

A. Engineer's approval required:

1. The Contract is based on the materials, equipment and methods described in the Contract Documents.
2. The Engineer will consider proposals for substitution of materials, equipment and methods only when such proposals are accompanied by full and complete technical data and all other information required by the Engineer to evaluate the proposed substitution.
3. Do not substitute materials, equipment or methods unless such substitution has been specifically approved for this Work by the Engineer.

B. "Or equal":

1. Where the phrase "or equal" occurs in the Contract Documents, do not assume that material, equipment or methods will be approved as equal by the Engineer unless the item has been specifically approved for this Work by the Engineer.
2. The decision of the Engineer shall be final.

C. Availability of specified items:

1. Verify prior to bidding that all specified items will be available in time for installation during orderly and timely progress of the work.
2. In the event specified item or items will not be so available, so notify the Engineer prior to receipt of bids.

2.05 PHOTOGRAPHS

A. The Contractor shall conduct video documentation of sites whether in streets, easements, or private property, and furnish two sets of DVDs to the Engineer prior to mobilization of the project. During ongoing construction, sufficient digital photographs (not less than 5 per work day) shall be taken at each site during the progress of the work to document existing conditions and final completion of the work. Digital photographs shall be submitted on CD to the Engineer on a monthly basis.

PART 3 EXECUTION

3.01 IDENTIFICATION OF SUBMITTALS

A. Completely identify each submittal and resubmittal by showing at least the following information:

1. Name and address of submitter, plus name and telephone number of the individual who may be contacted for further information.
2. Name of project.
3. Drawing number and Specifications Section number to which the submittal applies.

4. Whether this is an original submittal or resubmittal.

3.02 COORDINATION OF SUBMITTALS

A. General:

Prior to submittal for Engineer's review, use all means necessary to fully coordinate all material, including the following procedures:

1. Determine and verify all field dimensions and conditions, materials, catalog numbers and similar data.
2. Coordinate as required with all trades and with all public agencies involved.
3. Secure all necessary approvals from public agencies and others and signify by stamp, or other means, that they have been secured.
4. Clearly indicate all deviations from the Contract Documents.

B. Grouping of submittals:

Unless otherwise specifically permitted by the Engineer, make all submittals in groups containing all associated items. The Engineer may reject partial submittals as not complying with the provisions of the Contract Documents.

3.03 TIMING OF SUBMITTALS

A. General:

Make all submittals far enough in advance of scheduled dates of installation to provide all required time for reviews, for securing necessary approvals, for possible revision and resubmittal and for placing orders and securing delivery.

B. Delays:

Costs of delays occasioned by tardiness of submittals may be back charged as necessary and shall not be borne by the Owner.

END OF SECTION

SECTION 01340

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Procedures for submittals.
- B. Schedule of submittals.

1.02 GENERAL

- A. Submit shop drawings, product data and samples that are complete with respect to dimensions, design criteria and materials of construction.
- B. Identify, in writing, any deviations from the requirements of the Contract Documents.
- C. Use and complete the transmittal form included at the end of this Section for all submittals of shop drawings, product data and samples. **SUBMITTALS MADE WITHOUT THE REQUIRED TRANSMITTAL FORM WHICH CLEARLY IDENTIFIES THE RESPECTIVE SPECIFICATION SECTION NUMBER FOR WHICH THE SUBMITTAL IS BEING MADE WILL BE RETURNED WITHOUT REVIEW. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAKE CLEARLY IDENTIFIED SUBMITTALS.**
- D. If similar or identical submittal material can be submitted under more than one specification section, the CONTRACTOR shall make separate clearly identified submittals for each specification section. Submittal materials for any specification section shall be complete for that section; partial submittals are unacceptable.

1.03 SHOP DRAWINGS

- A. Present in a clear and thorough manner. Title each drawing with Project name and number; identify each element of drawings by reference to sheet number, detail, and schedule of Contract Documents.
- B. Identify field dimensions; show relation to adjacent or critical features, Work, or products.
- C. Sheet Size: 8-1/2 inches by 11 inches minimum; maximum 24 inches by 36 inches.
- D. Number Required: Six (6) copies of each page or sheet assembled in separate sets.

1.04 PRODUCT DATA

- A. Submit only pages which are pertinent; mark each copy of standard printed data to identify pertinent products, referenced to Specification Section and Article number. Show reference standards, performance characteristics, and capacities; wiring and piping diagrams and controls; component parts; finishes; dimensions; and required clearances. Provide Material Safety Data Sheets required by OSHA for all chemicals to be supplied under this Contract.
- B. Modify manufacturer's standard schematic drawings and diagrams to supplement standard information and to provide information specifically applicable to the Work. Delete information not applicable.

- C. Provide manufacturer's instructions for preparation, assembly, delivery, storage, installation, start up, adjusting, and finishing.

1.05 SAMPLES

- A. Submit for ENGINEER'S selection, the full range of manufacturer's standard finishes, except when more restrictive requirements are specified, indicating colors, textures, and patterns.
- B. Submit samples to illustrate functional characteristics of products, including parts and attachments.
- C. Acceptable samples which may be used in the Work are indicated in the specification sections.
- D. Label each sample with identification corresponding to transmittal letter.
- E. Provide field samples of finishes at Project, at location acceptable to ENGINEER, as required by individual specification sections. Install each sample complete and finished. Acceptable finishes in place may be retained in completed work.
- F. Those provisions of paragraph 1.03 which relate to submittal identification and completeness are applicable for sample submittal.

1.06 CONTRACTOR REVIEW

- A. Review submittals prior to transmittal; determine and verify field measurements, field construction criteria, manufacturer's catalog numbers, and conformance of submittal with requirements of Contract Documents.
- B. Coordinate submittals with requirements of Work and of Contract Documents.
- C. Sign and date each sheet of shop drawings and product data and label each sample to certify compliance with requirements of Contract Documents. Notify ENGINEER in writing at time of submittal, of any deviations from requirements of Contract Documents.
- D. Do not fabricate or ship products or begin work which requires submittals until return of submittal that ENGINEER has reviewed and found acceptable.
- E. Check and verify all field measurements and promptly submit shop drawings and working drawings so that there shall be no delay in the Work.
- F. CONTRACTOR shall be responsible for the delays and/or additional expenses that result from the CONTRACTOR'S failure to submit a complete submittal and/or to identify portions of the submittal that do not conform to the specifications.

1.07 SUBMITTAL REQUIREMENTS

- A. Submit shop drawings, product data and samples to ENGINEER using transmittal form provided in this Section. Identify Project by title and number. Identify work and product by specification section and paragraph number. ENGINEER will designate a submittal number upon receipt.
- B. Apply CONTRACTOR'S stamp, and sign certifying as to review. The CONTRACTOR'S stamp and signature shall represent that the CONTRACTOR has determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers and similar data; that the CONTRACTOR assumes full responsibility for doing so and that each shop drawing or sample has been reviewed and coordinated with the requirements of the Work and the Contract

Documents.

- C. Coordinate submittals into logical groupings to facilitate interrelation of the several items:
 - 1. Finishes which involve ENGINEER selection of colors, textures, or patterns.
 - 2. Associated items which require correlation for efficient function or for installation.
- D. Shop Drawings: Submit one (1) electronic copy.
- E. Product Data: Submit one (1) electronic copy.
- F. Samples: Submit number of samples required by individual specification sections.
- G. Submit Professional Engineer certification form required in applicable specification section.

1.08 RESUBMITTALS

- A. Make corrections required by ENGINEER and resubmit shop drawings, product data and samples using same procedures specified for initial submittals. Direct specific attention, in writing or on resubmitted shop drawings, product data or samples, to any revisions other than the corrections required by the ENGINEER.

1.09 ENGINEER REVIEW

- A. ENGINEER will respond to submittals with reasonable promptness.
- B. Reviewed submittals will be returned stamped as follows:

# _____	JOB# _____
 Stantec	<input type="checkbox"/> REVIEWED <input type="checkbox"/> REVIEWED AS MODIFIED <input type="checkbox"/> REVISE AND RE-SUBMIT <input type="checkbox"/> NOT REVIEWED
<p>THIS REVIEW BY STANTEC CONSULTING SERVICES, INC. IS FOR THE SOLE PURPOSE OF ASCERTAINING CONFORMANCE WITH THE GENERAL DESIGN CONCEPT. THIS REVIEW SHALL NOT MEAN THAT STANTEC CONSULTING SERVICES, INC. APPROVES THE DETAIL DESIGN INHERENT IN THE SHOP DRAWINGS, RESPONSIBILITY FOR WHICH SHALL REMAIN WITH THE CONTRACTOR SUBMITTING SAME, AND SUCH REVIEW SHALL NOT RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITY FOR ERRORS OR OMISSIONS IN THE SHOP DRAWING OR OF HIS RESPONSIBILITY FOR MEETING ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS TO BE CONFIRMED AND CORRELATED AT THE JOB SITE, FOR INFORMATION THAT PERTAINS SOLELY TO FABRICATION PROCESSES OR TO TECHNIQUES OF CONSTRUCTION AND INSTALLATION AND FOR CO-ORDINATION OF THE WORK OF ALL SUBTRADES.</p> <p>STANTEC CONSULTING SERVICES, INC.</p>	
BY:	DATE:

- C. Review and acceptance of an item by the ENGINEER will not indicate acceptance of the assembly in which the item may function.

1.10 DISTRIBUTION

- A. Duplicate and distribute reproductions of shop drawings, copies of product data, and samples, which bear ENGINEER'S stamp to job site file, Record Documents file, subcontractors, suppliers, other affected contractors, and other entities requiring information.

1.11 SCHEDULE OF SUBMITTALS

- A. Shop drawings, product data and sample submittals shall be made in a timely and logical fashion taking into account work scheduling and job progress.
- B. It is the CONTRACTOR'S responsibility to prepare, coordinate, and review all submittals prior to delivery to ENGINEER. The ENGINEER will review each submittal and the first resubmittal at no cost to the CONTRACTOR. The CONTRACTOR shall reimburse the OWNER for all reasonable costs associated with the ENGINEER'S, and his consultant's review of each subsequent resubmittal.

1.12 REVIEW QUALIFICATION

- 1.13 Regardless of corrections made or acceptance of such drawings by the ENGINEER, the CONTRACTOR will nevertheless be responsible for the accuracy of such drawings and for their conformity to the Contract Documents. The CONTRACTOR shall notify the ENGINEER in writing of any deviations at the time he furnishes such drawings.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SUBMITTAL FORM

Date: _____

Submittal Title and Description: _____

1. The attached submittal is for the following material or equipment:

Specification Section No.: _____ Paragraph: _____

Specification Title: _____

Drawing No.: _____ Title: _____

2. This submittal is for material or equipment that is (check one):

- in full compliance with that specified
- in compliance with that specified except for the following minor deviations:

(Clearly identify the minor deviations. If the ENGINEER determines these deviations to be other than minor, the submittal will be rejected and the CONTRACTOR must submit a request for substitution in accordance with Section 01630.) Use additional pages, if necessary, for description of deviation.

Signed _____

Title _____

Company _____
Contractor

SECTION 01370

SCHEDULE OF VALUES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Procedures for preparation and submittal of schedule of values.

1.02 FORMAT

- A. Type schedule on AIA Document G703 or alternate form approved by ENGINEER.
- B. Follow table of contents of Contract Documents for listing component parts. Identify each line item by number and title of major specification section. Separate items by corresponding division.
- C. If Project is bid as unit price, follow bid item schedule for listing component parts.

1.03 CONTENT

- A. List estimated installed value of each major item of Work and each subcontracted item of Work as a separate line item to serve as a basis for computing values for Progress Payments. Round off values to nearest dollar. Each line item shall have a maximum value of \$25,000 unless the item cannot be subdivided further. Line items shall be subtotalized by corresponding division.
- B. For each major subcontract, list products and operations of that subcontract as separate line items.
- C. Coordinate listed items with Progress Schedule.
- D. For lump sum contracts, component listing shall each include a directly proportional amount of CONTRACTOR'S overhead, profit and bonds and insurance costs.
- E. For items on which payments will be requested for stored products, list sub-values for cost of stored products.
- F. The sum of values listed shall equal total Contract Price.
- G. If Project is bid as unit price contract, follow bid item schedule for listing component parts.
- H. Unbalanced schedule of values will not be acceptable and, when discovered, will be returned for adjustment to reflect actual costs.

1.04 SUBMITTAL

- A. Submit six (6) copies of schedule ten (10) days prior to first Application for Payment.

1.05 SUBSTANTIATING DATA

- A. When ENGINEER requires substantiating information, submit data justifying line item amounts in question. Only those line item amounts which the CONTRACTOR can justify to the ENGINEER'S satisfaction will be acceptable.

B. Provide six (6) copies of data with cover letter.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01400

QUALITY CONTROL

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. General quality control.
- B. Manufacturers' field services.

1.02 QUALITY CONTROL, GENERAL

- A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

1.03 WORKMANSHIP

- A. Comply with industry standards except when more restrictive tolerances, more rigid standards, or more precise workmanship are specified.
- B. Perform work using persons qualified to produce workmanship of specified quality.
- C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

1.04 MANUFACTURERS' INSTRUCTIONS

- A. Comply with manufacturer's printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing, as appropriate.
- B. Comply with instructions in full detail, including each step-in sequence. Should instructions conflict with Contract Documents, request clarification from ENGINEER before proceeding.

1.05 MANUFACTURERS' CERTIFICATES

- A. As required by individual specification sections, submit manufacturer's certificate, in duplicate, that products meet or exceed specified requirements.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01630

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. CONTRACTOR'S options in selection of products.
- B. Products list.
- C. Requests for substitution of products.

1.02 CONTRACTOR OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Submit data substantiating that product meets those standards in accordance with Section 01340, if required.
- B. Products Specified by Naming One or More Manufacturers with a Substitution Paragraph: Submit a request for substitution for products of any manufacturer not specifically named.

1.03 PRODUCTS LIST

- A. At preconstruction conference submit three (3) copies of a list of major products which are proposed for installation, including name of manufacturer. The CONTRACTOR will not be allowed a substitution for products not identified on this list.
- B. Tabulate products by specification section number, title, and paragraph number.
- C. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.
- D. ENGINEER will not reply to this list of major products. All acceptance or rejection and comments by the ENGINEER will be reserved until submittal of product data for conforming products or products proposed for substitution.

1.04 LIMITATIONS ON SUBSTITUTIONS

- A. Many sections of these specifications are based on specific manufacturer recommendations. Use of these recommendations does not and is not intended to exclude equal equipment of other manufacturers. The specifications serve only as a guide to minimum quality and performance.

1.05 REQUESTS FOR SUBSTITUTIONS

- A. Requests for substitutions not made in strict conformance with this paragraph will be unacceptable and will be rejected by the ENGINEER without review.
- B. Submit separate request for each substitution using the form included at the end of this Section. Document each request with complete data substantiating compliance of proposed substitution with requirements of Contract Documents.

- C. Identify product by specification sections and paragraph numbers. Provide manufacturer's name and address, trade name of product, and model or catalog number. List fabricators and suppliers as appropriate.
- D. Attach product data as specified in Section 01340.
- E. List similar projects using product, dates of installation, and names of ENGINEER and OWNER.
- F. Give itemized comparison of proposed substitution with specified product, listing variations, and reference to Specification section and paragraph numbers.
- G. Give quality and performance comparison between proposed substitution and the specified product.
- H. Give cost data comparing proposed substitution with specified product, and amount of net change to Contract Price.
- I. List availability of maintenance services and replacement materials.
- J. State effect of substitution on construction schedule, and changes required in other work or products.
- K. A substitute product may be considered equal to the product identified in the Specifications if (1) it is at least equal in quality, durability, appearance, strength and design; (2) it will perform at least equally the function imposed by the general design for the work being contracted for or the material being purchased; and (3) it conforms substantially, even with deviations, to the detailed requirements for the product in said Specifications.

1.06 REDESIGN

- A. Redesign of any portion of the work affected by the substitution and coordination of installation of the substitution shall be the responsibility of the CONTRACTOR. There shall be no increase in Contract Price for redesign due to substitution of products.

1.07 CONTRACTOR REPRESENTATION

- A. Submission of a request for substitution constitutes a representation that CONTRACTOR has investigated proposed product and has determined that it is equal to or superior in all respects to specified product. The ENGINEER, however, will make such determination based on the CONTRACTOR'S request under paragraph 1.05.
- B. CONTRACTOR shall provide as a minimum, the same warranty for substitution products as for specified product.
- C. CONTRACTOR shall coordinate installation of accepted substitute, making such changes as may be required for Work to be complete in all respects.
- D. CONTRACTOR waives claims for additional costs related to substitution which may later become apparent.

1.08 SUBMITTAL PROCEDURES

- A. After preconstruction conference, submit one (1) electronic copy of request for substitution.

- B. ENGINEER will respond to CONTRACTOR'S requests for substitutions with reasonable promptness.
- C. ENGINEER will notify CONTRACTOR, in writing, of decision to accept or reject requested substitution.
- D. For accepted products, submit shop drawings, product data, and samples in accordance with Section 01300.
- E. Submit with request such drawings as are necessary to define the redesign necessary to accommodate product substitution. Drawings shall be stamped by a professional engineer registered in the State where the work under this Contract is located, and for the engineering disciplines affected by the substitution.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Installation of substitutions shall not be done unless written acceptance of ENGINEER has been given.

SUBSTITUTION REQUEST FORM

Date: _____

1. Name of product to be substituted: _____

2. Name of product requested as substitute: _____

3. Specification Section Reference: _____
Drawing Number Reference: _____

4. Attach Product Data to this form.

5. List similar projects using this product:

<u>Project</u>	<u>Date of Installation</u>	<u>Engineer</u>	<u>Owner</u>
i.	_____		
ii.	_____		
iii.	_____		

6. Attach itemized comparison by Specification Paragraph.

7. State effect of substitution on:

- i. Construction Schedule: _____
- ii. Project Cost: _____
- iii. Changes Required in Other Work: _____

8. Contractor Representations:

- i. Contractor has complied with Section 01630 in its entirety.
- ii. Contractor has investigated proposed substitution and has determined that it is equal or superior to the project specified.
- iii. Contractor will provide same warranty as required for the specified product, as a minimum.
- iv. Contractor will coordinate installation of substitution through completion.

- v. Contractor waives all claims for additional costs related to substitution which may later become apparent.
- vi. Contractor agrees to pay all reasonable fees of the Engineer and other consultants in making an evaluation of this substitution request whether such request is ultimately accepted or not.

9. Certification:

Signed _____

Title _____

Company _____
(Contractor)

END OF SECTION

SECTION 01570

TRAFFIC CONTROL

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Providing, erecting, and maintaining all necessary barricades, lighting, signals, signs, traffic control devices, and employ uniformed officers and flagging personnel as required for the protection of the Work and safety of the public. The Work shall be done in strict accordance with the requirements of the Town of Maynard's Highway Department and be in place prior to the commencement of construction.
- B. CONTRACTOR'S methods for routing of traffic during construction shall be presented for approval to the ENGINEER and local Highway Department representative at the preconstruction conference.
- C. The Contractor must maintain access to local residents and public safety vehicles at all times during construction.
- D. A uniformed police officer will be required at each end of the work area unless otherwise required by the Chief of Police.
- E. The Contractor shall notify the Police Department twenty-four hours (24) hours in advance to schedule detail requirements. These requests will not be binding. The Contractor shall verify requests as required by the Town. The Contractor will pay the police charges if he fails to adequately cancel a requested detail.
- F. No work shall begin before 7:00 A.M unless approved by the Town.
- G. All equipment shall be off the road and the roadway swept no later than 5:00 P.M.
- H. No work will be allowed on Sunday or Holidays unless approved by the Town.

1.02 TRAFFIC CONTROL REQUIREMENTS

- A. Prior to beginning construction, the Contractor shall meet with the Engineer, Highway Superintendent, and Police Chief to establish construction traffic control requirements.
- B. The Contractor shall be responsible for traffic control at all times.
- C. The Contractor shall maintain access to local residents, emergency vehicles, school buses, and businesses at all times.
- D. The Contractor shall be prepared to open the street immediately to all emergency vehicles should any emergency occur. The Contractor shall keep the Maynard Police and Fire Departments constantly notified of the status of street access should an unusual construction situation occur which blocks the streets.
- E. The Contractor shall be responsible for completely re-opening all streets each night to all traffic at the end of the normal work day to the Engineer's satisfaction.

- F. Roadway clean-up shall be accomplished in sufficient time before the end of the work day and to place all proper warning devices including working flashing lights to the Engineer's satisfaction before the Contractor departs the work area for the day.
- G. Barrier devices and flashers shall also be in workable condition and properly maintained on each non-work day, weekends and holidays at the Contractor's expense.

1.03 DETOURS AND ROAD CLOSINGS

- A. The Contractor shall not close any street during construction and shall maintain a minimum of one travel lane at all times unless otherwise approved by the Engineer after discussions with the Highway Dept. and Police Chief.

1.04 CONSTRUCTION EQUIPMENT

- A. The Contractor shall not park construction equipment during non-working hours within the right-of-way without permission from the appropriate Police Chief.
- B. All equipment shall have adequate barricades, signs and flashers as approved by each Chief of Police.

PART 2 PRODUCTS

2.01 GENERAL

- A. All barricades, warning signs, lights, temporary signals, and other protective devices must conform to the Town of Maynard standards and to the Manual of Uniform Traffic Control Devices for Streets and Highways published by the U.S. Government Printing Office.

PART 3 EXECUTION

3.01 PERMITS

- A. All work in, upon, under, or across public streets and roads shall be accordance with the Road Opening Permits issued by the Maynard Highway Departments for this project.

3.02 POLICE

- A. The Town of Maynard will furnish all necessary police services required during the sewer rehabilitation and area clean up.
- B. The Contractor shall be responsible for ordering the necessary police detail which shall be required for each work day. The next day's requirement shall be coordinated with the Police Department each day before the end of the work day.
- C. The Contractor shall also be responsible for the cancellation of the police detail ordered for a particular work day if the contractor decides not to work for any reason. The Contractor shall follow the cancellation procedures established by each Chief of Police. Failure on the Contractor's part to properly cancel an ordered police detail in accordance with the Police Department procedures that results in duty officers reporting for duty and entitled to pay, shall be paid for by the Contractor, with no additional reimbursement.

3.03 SIGNS

- A. Streets partially closed or detoured shall be suitably protected by traffic signs, barrels, flashing caution lights, barricades or other traffic devices furnished and erected by the Contractor at locations directed by the Engineer at no expense to the Owner.
- B. Contractor is to submit a Traffic Management Plan to be approved by the Chief of Police prior to start of construction. Signs reading as shown below shall be used as directed.
 - 1. Road Construction Ahead
 - 2. Right (Left) Lane Closed
 - 3. Construction Ahead
 - 4. Men Working
 - 5. Detour → Detour ← Detour ↑
- C. The Contractor shall at his own expense provide, erect and maintain, as directed, all other barricades, barrier fences, flashing lights, traffic signs, and other traffic devices acceptable to protect the work from traffic, pedestrians, or animals; and to prevent unauthorized entry during construction. He shall, at his own expense, provide sufficient temporary lighting or other approved illuminated traffic signs and devices to afford adequate protection to the traveling public. The Contractor shall also, at his own expense, furnish a sufficient number of watchmen to protect the work when directed by the Engineer.
- D. All barricades, barrier fences, traffic signs, and other traffic devices must conform to the manual on Uniform Traffic Control Devices for Streets and Highways published by the Bureau of Public Roads.
- E. The Contractor shall be held responsible for all damage to the work due to the failure of barricades, barrier fences, warning signs, or lights to properly protect the work from traffic, pedestrians, or other causes.
- F. Fire, Police, and School Departments from Maynard shall, at all times, be informed of traffic obstructions by the Contractor.

END OF SECTION

SECTION 01620

STORAGE AND PROTECTION

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Providing secure storage and protection for products to be incorporated into the Work and maintaining and protecting products after installation and until completion of the Work.

1.02 STORAGE

- A. Store and protect products immediately upon delivery. Store in accordance with manufacturer's instructions, with seals and labels intact and legible.

- B. Store products subject to damage by elements in substantial weather tight enclosures.

- 1. Maintain temperatures within ranges required by manufacturer's instructions.

- 2. Provide humidity control for sensitive products, as required by the manufacturer's instructions.

- 3. Store unpacked products on shelves, in bins or in neat piles, accessible for inspection.

- C. Exterior Storage:

- 1. Provide substantial platforms, blocking or skids to support fabricated products above ground and to prevent soiling or staining. Cover products subject to discoloration or deterioration from exposure to the elements, with impervious sheet coverings. Provide adequate ventilation to avoid condensation.

- D. Arrange storage in manner to provide easy access for inspection.

1.03 MAINTENANCE OF STORAGE

- A. Inspect stored products on scheduled basis to assure that:

- 1. State of storage facilities is adequate to provide required conditions.

- 2. Required environmental conditions are maintained on continuing basis.

- 3. Surfaces of products exposed to elements are not adversely affected.

- B. Any product damaged because of improper storage or protection shall be unacceptable for installation and shall be removed from the site.

- C. Lawns and Landscaping: Prohibit traffic of any kind across planted lawn and landscaped areas.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01560

TEMPORARY CONTROLS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Providing and maintaining methods, equipment, and temporary construction, as necessary to provide controls over environmental conditions at the construction site and related areas under CONTRACTOR'S control. Removal of physical evidence of temporary facilities at completion of the Work.

1.02 DUST CONTROL

- A. Provide positive methods and apply dust control materials such as calcium chloride or water to minimize raising dust from construction operations and provide positive means to prevent dust from dispersing into the atmosphere.
- B. Calcium chloride shall conform to AASHTO Standard Specification M 144, Type I or Type II. The calcium chloride shall be packaged in moisture proof bags or in airtight drums with the manufacturer, name of product, net weight, and percentage of calcium chloride guaranteed by the manufacturer legibly marked on each container.
- C. Calcium chloride failing to meet the requirements of the aforementioned specifications, or that has become caked or sticky in shipment, may be rejected by the Engineer.

1.03 WATER CONTROL

- A. Provide methods to control surface water to prevent damage to the Project, the site, or adjoining properties. Control fill, grading and ditching to direct surface drainage away from excavations, pits, tunnels and other construction areas; and to direct drainage to proper disposal.
- B. Provide, operate and maintain pumps and equipment of adequate capacity to control surface and water.
- C. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas in accordance with local, state and federal regulations.

1.04 RODENT CONTROL

- A. Provide rodent control as necessary to prevent infestation of construction or storage area. Employ methods and use materials which will not adversely affect conditions at the site or on adjoining properties.
- B. Use rodenticide in full accordance with the manufacturer's printed instructions and recommendations, and local, state and federal regulations.
- C. Baiting will include a pre-construction baiting program followed by a maintenance baiting program that lasts throughout the construction period. All baiting will be done according to the rodenticide labeling as approved by the U.S. EPA and the Massachusetts Department of Food and Agriculture. All bait applications will be made by licensed pest control operators and based upon activity levels and distribution of rodent control populations.

- D. Records must be maintained on baiting and survey results. A summary of determinable results of the control program must be submitted to the Engineer on a monthly basis. The summary must include the types of bait used, baiting locations, a description of rodent activity and sanitation conditions, and recommendations. Control shall include baiting of active rat borrows and the use of tamper-resistant bait stations, as appropriate. Control shall also be applied at all manholes and/or catch basins within the immediate contract area and to all catch basins and sewer manholes on adjoining streets within 300 feet of the limits of construction.
- E. The pest control operator must provide adequate liability insurance and be prepared to respond to changes in rodent populations and any rodent related complaints associated with construction activities.

1.05 DEBRIS CONTROL

- A. Maintain all areas under CONTRACTOR'S control free of debris.
- B. Initiate and maintain a specific program to prevent accumulation of debris at construction site, storage and parking areas, or along access roads and haul routes.
 - 1. Provide containers for deposit of debris.
 - 2. Prohibit overloading of trucks to prevent spillages on access and haul routes. Provide periodic inspection of traffic areas and enforce requirements.
 - 3. Schedule periodic collection and disposal of debris to prevent accumulation.

1.06 POLLUTION CONTROL

- A. Provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by the discharge of noxious substances from construction operations.
- B. Provide equipment and personnel to perform emergency measures required to contain any spillages, and to remove contaminated soils or liquids. Excavate and dispose of any contaminated earth in accordance with local, state and federal regulations, and replace with suitable compacted fill and topsoil.
- C. Take all appropriate measures to prevent harmful substances from entering surface waters and groundwater. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams, or in sanitary or storm sewers.
- D. Provide systems to prevent dispersal of harmful pollutants into the atmosphere.

1.07 EROSION CONTROL

- A. Plan and execute construction and earth work by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation.
 - 1. Minimize areas of exposed bare soil.
 - 2. Provide temporary control measures such as berms, dikes and drains.
- B. Construct fills and waste areas by selective placement to eliminate surface silts or clays which will erode.

- C. Periodically inspect earthwork to detect any evidence of the start of erosion. Apply corrective measures as required to control erosion.
- D. Construct sediment basins, diversion ditches, hay bale dikes or such other erosion control devices to control runoff from any area subject to erosion during construction. All such precautionary measures including, but not limited to, construction of sediment basins, diversion ditches, benches, berms or hay bale dikes or laying fiber matting on slopes until vegetation is established, shall be at no extra cost to the OWNER.
- E. Comply with all local, state and federal permits and requirements.

1.08 STORAGE AND PROTECTION

- A. Material
 - 1. All loose granular material, pipes and other commonly used material shall be stored off the roadway but within the right-of-way of the roadway. Lighted barriers shall be placed around the said material to make them visible to vehicular traffic.
- B. Equipment
 - 1. All equipment shall be stored off the roadway but within the right-of-way of the roadway. Lighted barriers shall be placed around the vehicles to make them visible to vehicular traffic.

1.09 TRAFFIC SAFETY

- A. Schedule construction and place excavated materials so that vehicular and pedestrian traffic may be maintained at all times.
- B. Traffic shall be protected by barricades, warning and advance warning signs. The placement of materials shall be in general compliance with the U.S. Department of Transportation's Manual on Uniform Traffic Control Devices, latest edition, and be subject to the approval of the OWNER and ENGINEER. If the Contractor's operations cause traffic hazards, he shall repair the road surface, provide temporary ways, erect barricades or fences and/or take other safety measures in accordance with local, state and federal regulations.

1.10 SANITARY FACILITIES

- A. The Contractor shall be responsible for coordinating the need for temporary sanitary facilities and for the removal at the end of the construction period.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 CONSTRUCTION METHODS

- A. CALCIUM CHLORIDE FOR ROADWAY DUST CONTROL / WATER FOR ROADWAY DUST CONTROL. The work under these Items shall conform to the relevant provisions of Section 440 "Roadway Dust Control" of the Massachusetts Department of Transportation Standard Specifications for Highways and Bridges dated 1988 and the English Edition of Supplemental Specifications dated June 15, 2012.

- B. Calcium chloride shall be applied when ordered by the Engineer and only in areas which will not be adversely affected by the application. See Section 01567 - ENVIRONMENTAL PROTECTION.
- C. Calcium chloride shall be uniformly applied at the rate of 1-1/2 pounds per square yard or at any other rate as directed by the Engineer. Application shall be by means of a mechanical spreader, or other approved methods. The number and frequency of applications shall be determined by the Engineer.
- D. Care shall be taken to avoid application of calcium chloride on any paved surfaces. If calcium chloride is applied to paved surfaces, the affected surfaces shall be immediately cleaned of all calcium chloride.
- E. Prior to application of calcium chloride, all loose dirt shall be swept from paved surfaces into the trench area.
- F. At the direction of the Engineer, the Contractor shall provide street sweeping at least once per week to control dust in the work area.

END OF SECTION

SECTION 01567

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.01 DESCRIPTION

- A. The work covered by this section of the specifications consists of furnishing all labor, materials, tools and equipment and performing all work required for the prevention of environmental pollution during and as a result of construction operations under this contract.
- B. The requirements set forth in this section of the specifications apply to cross country areas, stream crossings and areas adjacent to wetlands, unless otherwise specifically stated. Cross country areas proceed over fields, through woods, rather than on a road or path.

1.02 NOTIFICATION

- A. The Engineer will notify the Contractor in writing of any noncompliance with the foregoing provisions. The Contractor shall, after receipt of such notice, immediately take corrective action. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose. If the Contractor fails to act promptly, the Engineer may order stoppage of all or part of the work until satisfactorily corrective action has been taken. No claim for an extension of time or for excess costs or damage incurred by the Contractor as a result of time lost due to any stop orders shall be made unless it was later determined that the Contractor was in compliance.

1.03 IMPLEMENTATION

- A. Prior to commencement of work, the Contractor shall meet with representatives of the Engineer to develop mutual understandings relative to compliance of the environmental protection program.

PART 2 PRODUCTS

None Used

PART 3 EXECUTION

3.01 AREAS OF CONSTRUCTION ACTIVITY

- A. Insofar as possible, the Contractor shall confine his construction activities to those areas defined by the plans and specifications. All land resources within the project boundaries and outside the limits of permanent work performed under this contract shall be preserved in their present condition or be restored to a condition after completion of construction at least equal to that which existed prior to work under this contract.

3.02 PROTECTION OF WATER RESOURCES

- A. The Contractor shall not pollute streams, lakes or reservoirs with fuels, oils, bitumens, calcium chloride, acids or harmful materials. It is the Contractor's responsibility to comply with all applicable Federal, State, County and Municipal laws regarding pollution of rivers and streams.
- B. Special measures should be taken to insure against spillage of any pollutants into public waters.

3.03 PROTECTING AND MINIMIZING EXPOSED AREAS

- A. The Contractor shall limit the area of land which is exposed and free from vegetation during construction. In areas where the period of exposure will be greater than two (2) months, temporary vegetation, mulching or other protective measures should be provided as specified.
- B. The Contractor shall take account of the conditions of the soil where temporary cover crop will be used to ensure that materials used for temporary vegetation are adaptive to the sediment control. Materials to be used for temporary vegetation shall be approved by the Engineer.

3.04 LOCATION OF STORAGE MATERIAL

- A. The location of the Contractor's storage areas for equipment and/or materials shall be upon cleared portions of the job site or areas to be cleared and shall require written approval of the Engineer. Plans showing storage facilities for equipment and materials shall be submitted for approval of the Engineer.
- B. No excavated materials or materials used in backfill operations shall be deposited within a minimum distance of twenty-five (25) feet of any watercourse or any drainage facility. Adequate measures for erosion and sediment control such as the placement of fiber rolls and silt fences around the downstream perimeter of stockpiles shall be employed to protect any downstream areas from siltation.
- C. The Engineer may designate a particular area or areas where the Contractor may store materials used in his operations.

3.05 PROTECTION OF LANDSCAPE

- A. Except in areas marked on the plans to be cleared, the Contractor shall not deface, injure, or destroy trees or shrubs nor remove or cut them without special authority. No ropes, cables or guys shall be fastened to or attached to any existing nearby trees for anchorages unless specifically authorized by the Engineer. The Contractor shall in any event be responsible for any damage resulting from such use.
- B. Where, in the opinion of the Engineer, trees may possibly be defaced, bruised, injured, or otherwise damaged by the Contractor's equipment or by his blasting or other operations, the Engineer may direct the Contractor to adequately protect such trees by placing boards, planks, poles or fencing around them. Any trees or landscape feature scarred or damaged by the Contractor's equipment or operations shall be restored as nearly as possible to its original condition at the expense of the Contractor. The Engineer will decide what method of restoration shall be used, and whether damaged trees shall be treated and healed or removed and disposed of under the provisions of Section 02110, CLEARING AND GRUBBING.

3.06 DISCHARGE OF DEWATERING OPERATIONS

- A. Any water that is pumped and discharged from the trench and/or excavation as part of the Contractor's water handling shall be filtered by an approved method prior to its discharge into a receiving water or drainage system.
- B. Under no circumstances shall the Contractor discharge water to the areas designated as wetlands.

C. Pumped water shall be filtered through baled straw, geotextile filter fabric, sedimentation tank(s), vegetated filter strip, vegetated channel or other approved method to trap sediment occurring as a result of the Work. The Vegetated Channels shall be constructed such that the discharge flow rate shall not exceed a velocity of more than 1 foot per second. Accumulated Sediment shall be cleared from the Sedimentation Collection System on a regular basis to maintain acceptable performance of the system.

3.07 DUST CONTROL

A. During the progress of the Work, the Contractor shall conduct his operations and maintain the area of activities including sweeping and sprinkling of streets as necessary, so as to minimize the creation and dispersion of dust. Calcium chloride shall not be used within 100 feet of a wetland. If the Engineer decides that it is necessary to use calcium chloride for more effective dust control, the Contractor shall furnish and spread the material, as directed. Calcium chloride shall be as specified under SECTION 01560, TEMPORARY CONTROLS.

3.08 SEPARATION OF TOPSOIL

A. From areas within which excavations in uplands are to be made, loam and topsoil shall be carefully removed and separately stored to be used again as directed by the Engineer. The depth of loam and topsoil to be salvaged and separately stored must be approved by the Engineer prior to excavation. The topsoil shall be stored in an area acceptable to the Engineer and adequate measures shall be employed to prevent erosion of said material.

3.09 REPLACEMENT OF TOPSOIL IN CROSS COUNTRY ROUTES

A. The contractor shall replace, back to its original locations and depths, that topsoil which has been separated according to the provisions described above.

3.10 FIBER ROLLS

A. Fiber rolls or approved equal shall be used as another primary erosion control measure. Fiber rolls shall be used in conjunction with silt fences except when used for hillside erosion control, where they may be used alone.

1. Fiber rolls shall be trenched between 3 and 5 inches into the ground, depending on the size of the fiber roll.
2. Fiber rolls shall be staked securely into the ground using wood stakes. A minimum of 3 inches of the stake shall stick out above the roll.
3. Stakes shall be spaced 3 to 4 feet apart unless otherwise approved by the DPW.
4. Fiber rolls placed around drain inlets shall be placed a minimum of one (1) foot back from the inlet.
5. For slope stabilization, fiber rolls shall be placed perpendicular to the expected flow of stormwater runoff, with the following separation:

1:1 slopes = 10 feet apart
2:1 slopes = 20 feet apart
3:1 slopes = 30 feet apart
4:1 slopes = 40 feet apart

3.11 SILT FENCE

- A. Where indicated on the drawings or where directed by the Engineer, the Contractor shall erect and maintain a temporary silt fence. The silt fence shall be used specifically to contain sediment from runoff water and to minimize environmental damage caused by construction.
- B. Silt fence shall be pre-assembled and factory assembled including filter fabric and posts. Filter fabric for pre-assembled silt fence shall consist of pervious sheets of woven propylene, nylon, polyester, or ethylene yarn. The filter fabric shall have reinforcing mesh behind it and include a top cord. Materials shall be certified by the manufacturer to meet the following requirements.

Physical Requirements for Fabric Silt Fence:

<u>Property</u>	<u>Test Method</u>	<u>Requirement</u>
Grab Tensile Strength	ASTM D4632	100 lbs.
Grab Elongation	ASTM D4632	20%
Apparent Opening Size	ASTM D4751	25 sieve
Mullen Burst	ASTM D3786	280 psi

1. The filter fabric shall contain a stabilizer and/or inhibitors to make the filaments resistant to deterioration resulting from exposure to sunlight or heat and to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 degrees to 120 degrees F. The filter fabric shall be a minimum of 36 inches wide, cut from a continuous roll to finish fence length to minimize the use of seams. Splice filter fabric together only when absolutely necessary and only at a support post, with a minimum 36-inch overlap and securely sealed. The filter fabric shall be free of defects or flaws that affect its physical and/or filtering properties.
2. Posts for the pre-assembled silt fence shall be 1 1/2" square hardwood posts, 4 feet 6 inches long and 6' on center.

3.12 SEDIMENT CONTROL DEVICES

- A. Sediment control devices such as dewatering pump discharge filter bags and catch basin inserts intended to capture sediment shall be made from non-woven geotextile material sewn with high strength, double stitched "J" type seams. They shall be capable of trapping particles larger than 150 microns, provide a filtered water turbidity of less than 50 NTU, and shall meet the following standards:

<u>Property</u>	<u>Test Method</u>	<u>Requirement</u>
Grab Tensile Strength	ASTM D4632	200 lbs.
Grab Elongation	ASTM D4632	50%
Apparent Opening Size	ASTM D4751	80 sieve
Mullen Burst	ASTM D3786	380 psi
Puncture Strength	ASTM D4833	130 lbs.
Trapezoid Tear Strength	ASTM D4533	80 lbs.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 REQUIREMENTS

- A. Comply with requirements stated in Conditions of the Contract and in Specifications for administrative procedures in closing out the work.

1.02 RELATED REQUIREMENTS

- A. Conditions of the Contract.
- B. Section 01010 – Summary of Work
- C. Section 00820d – Certificate of Substantial Completion

1.03 SUBSTANTIAL COMPLETION

- A. The CONTRACTOR shall submit written notification to the OWNER that the Contract documents have been reviewed, Work has been inspected, and that the CONTRACTOR considers the work to be substantially complete. The written submittal is to include a “punch list” of items to be completed or corrected.
- B. Within a reasonable time after receipt of such notice, the OWNER, in the presence of the CONTRACTOR, will make an inspection of the work, review and/or add to the punch list of items to be completed or corrected, and determine the status of completion.
- C. The OWNER will notify the CONTRACTOR in writing of any additional work items remaining to be completed or corrected.
- D. The CONTRACTOR shall remedy all work items remaining to be completed or corrected and then notify the OWNER in writing when all work has been completed.
- E. The OWNER, in the presence of the CONTRACTOR, will re-inspect the work.
- F. When the OWNER concurs that the work is substantially complete, the OWNER will:
 - 1. Prepare a Certificate of Substantial Completion, accompanied by CONTRACTOR's list of items to be completed or corrected, as verified and amended by the OWNER.
 - 2. Submit the Certificate to the CONTRACTOR for written acceptance of the responsibilities assigned to the CONTRACTOR in the Certificate.

1.04 FINAL CLEANING

- A. Execute final cleaning prior to final inspection.
- B. Clean surfaces exposed to view.
- C. Clean equipment and fixtures to a sanitary condition.
- D. Clean site; sweep disturbed areas, rake clean landscaped surfaces that have been disturbed

during construction.

E. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.05 FINAL INSPECTION

A. When the CONTRACTOR considers the work is complete; the CONTRACTOR shall submit written certification to the OWNER that:

1. Contract Documents have been reviewed.
2. Work has been inspected for compliance with Contract Documents.
3. Work has been completed in accordance with Contract Documents.
4. Equipment and systems have been tested in the presence of the OWNER and are operational.

B. The OWNER will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.

C. Should the OWNER consider that the work is incomplete or defective:

1. The OWNER will promptly notify the CONTRACTOR in writing, listing the incomplete or defective work.
2. CONTRACTOR shall take immediate steps to remedy the stated deficiencies, and then send a second written certification to the OWNER that the work is complete.
3. The OWNER will re-inspect the work.

D. When the OWNER finds that the work is acceptable under the Contract Documents, the OWNER will request the CONTRACTOR to make closeout submittals.

1.06 REINSPECTION FEES

A. Should the OWNER perform re-inspections due to failure of the work to comply with the claims of status of completion made by the CONTRACTOR, the OWNER will deduct any additional costs incurred by the OWNER for such re-inspections from the final payment to the CONTRACTOR.

1.07 CONTRACTOR'S CLOSEOUT SUBMITTALS TO OWNER

A. Evidence of compliance with requirements of governing authorities:

1. Certificate of Occupancy
2. Certificates of Inspection

B. Spare Parts and Maintenance Materials

C. Evidence of Payment and Release of Liens: Refer to requirements of General and Supplementary Conditions.

D. Certificates of Insurance for Products

E. Complete Operation Manuals

F. Warranty Information where applicable.

1.08 PROJECT RECORD DOCUMENTS

- A. Pursuant to the Section 00700 General Conditions, the CONTRACTOR shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Change Directives, Field Orders and written interpretations and clarifications in good order and annotated to show all changes made during construction on a dedicated Record Drawing set. All annotation notes and/or additions to the plans made by the CONTRACTOR shall be legible in red ink. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to ENGINEER for reference at all times.
- B. Subcontractors shall be responsible to the CONTRACTOR to keep the record documents for their portion of the work marked currently to record all changes in their work made during construction.
- C. The CONTRACTOR shall provide CCTV inspection reports and videos once the rehabilitation work has been finished. Any rehabilitation not witnessed by the ENGINEER or recorded by the CONTRACTOR, shall again be recorded by the CONTRACTOR, as directed by the ENGINEER, to allow for proper inspection, at no additional expense to the contract or OWNER.
- D. The ENGINEER will periodically inspect these record drawings, and their proper maintenance shall be a condition precedent to approval of requisitions for periodic payments.
- E. Upon completion of the Work, these record documents, Samples and Shop Drawings will be delivered to the ENGINEER for the OWNER. The CONTRACTOR shall cooperate and coordinate with the ENGINEER, who will prepare the final Record Drawings for the completed work. The CONTRACTOR is to provide any assistance the ENGINEER might reasonably require to complete the preparation of the Record drawings. This assistance is to include, but is not limited to, labor, ladders, tools, photographs, survey, and any/all records maintained by the CONTRACTOR in the completion of the Work that may be of assistance to the ENGINEER in the completion of the drawings.

1.09 FINAL ADJUSTMENT OF ACCOUNTS

- A. Submit a final statement of accounting to the OWNER.
- B. Statement shall reflect all adjustments to the Contract Sum:
 1. The original Contract Sum.
 2. Additions and deductions resulting from:
 - a. Previous Change Orders
 - b. Allowances
 - c. Unit prices.
 - d. Deductions for uncorrected work.
 - e. Penalties and bonuses.
 - f. Deductions for liquidated damages.
 - g. Deductions for re-inspection payments.
 - h. Other adjustments.
 3. Total Contract Sum, as adjusted.

4. Previous payments
5. Sum remaining due

C. The OWNER and/or ENGINEER will prepare a final Change Order, reflecting approved adjustments to the Contract Sum which were not previously made by Change Orders.

1.10 WARRANTIES

- A. Provide duplicate notarized copies.
- B. Execute and assemble documents from Subcontractors, suppliers and manufacturers.
- C. Provide Table of Contents and assemble in three D side ring binder with durable plastic cover.
- D. Submit prior to final Application for Payment.

1.11 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified.
- B. Deliver to and place in locations as directed by the OWNER.

1.12 FINAL APPLICATION FOR PAYMENT

- A. CONTRACTOR shall submit the final Application for Payment in accordance with procedures and requirements stated in the Conditions of the Contract.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

SECTION 01701

CONTRACT CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Administrative provisions for Contract closeout.

1.02 REQUIREMENTS FOR CLOSEOUT

- A. Neither the final payment nor the remaining retained percentage shall become due until the CONTRACTOR submits to the ENGINEER:

1. An affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the work for which the OWNER might in any way be responsible, have been paid or otherwise satisfied (see attached form at end of this section).
2. Data establishing payment or satisfaction of all such obligations, such as receipts, releases and waivers of liens arising out of the Contract, to the extent, and in such form as may be designated by the OWNER. If any subcontractor refuses to furnish a release or waiver required by the OWNER, the CONTRACTOR may furnish a bond satisfactory to the OWNER to indemnify the OWNER against any resulting lien. If any such lien remains unsatisfied after all payments are made, the CONTRACTOR shall refund to the OWNER all monies that the latter may be compelled to pay in discharging such lien, including all costs and attorney's fees.

- B. Additional requirements for Project closeout shall include submittal, (if not previously submitted) of the following:
 1. Project Record Documents: In accordance with Section 01720 - Project Record Documents.
 2. Evidence of payment of debts and claims in accordance with conditions of the Contract (see attached form at end of this section).
 3. Consent of Surety Company to final payment (see attached form at end of this section).
 4. Evidence of release of liens in accordance with conditions of the Contract (see attached form at end of this section).

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

SECTION 01701

CONTRACTOR'S AFFIDAVIT
OF
PAYMENT OF DEBTS AND CLAIMS

OWNER: TOWN OF MAYNARD - DPW
195 MAIN STREET
MAYNARD, MA 01754

CONTRACT FOR: CONSTRUCTION OF
DUPLEX PUMP SYSTEM INSTALLATION –
58 SUMMER HILL ROAD
CONTRACT DATE: _____

State of: MASSACHUSETTS

County of: MIDDLESEX

The undersigned hereby certifies that, except as listed below, he has paid in full or has otherwise satisfied all obligations for all materials and equipment furnished, for all work, labor, and services performed, and for all known indebtedness and claims against the Contract referenced above for which the OWNER or his property might in any way be held responsible.

EXCEPTIONS: (If none, write "None". If required by the OWNER, the CONTRACTOR shall furnish bond satisfactory to the OWNER for each exception.)

CONTRACTOR:

Address: _____

By: _____

Signature: _____

Title: _____

Subscribed and sworn to before me the _____ day of _____, 20_____.

Notary Public: _____

My Commission Expires: _____

SECTION 01701

CONSENT OF SURETY COMPANY
TO
FINAL PAYMENT

OWNER'S CONTRACT NO.: _____

AGREEMENT DATE: _____

ENGINEER' PROJECT NO.: _____

BOND NUMBER: _____

CONTRACT TITLE: DUPLEX PUMP SYSTEM INSTALLATION - 58 SUMMER HILL ROAD

TO: TOWN OF MAYNARD - DPW
195 MAIN STREET
MAYNARD, MA 01754

FROM: _____

In accordance with the provisions of the Contract between the OWNER and the CONTRACTOR as indicated above, the _____ (Surety) on the bond of _____ (Contractor) hereby approves of the final payment to the CONTRACTOR and agrees that final payment to the CONTRACTOR shall not relieve the Surety Company of any of its obligations to the TOWN OF MAYNARD DEPARTMENT OF PUBLIC WORKS (Owner) as set forth in the said Surety Company's Bond.

IN WITNESS WHEREOF, the Surety Company has hereunto set its hand this _____ day of _____ 20____.

(Surety Company)

(Signature of Authorized Representative)

(Title)

Attest: (Seal)

Note: Power of Attorney should be attached in instances where same applies.

SECTION 01701

CONTRACTOR'S FINAL
LIEN WAIVER

OWNER: TOWN OF MAYNARD - DPW
195 MAIN STREET
MAYNARD, MA 01754

CONTRACT FOR: CONSTRUCTION OF
DUPLEX PUMP SYSTEM INSTALLATION –
58 SUMMER HILL ROAD
CONTRACT DATE: _____

State of: MASSACHUSETTS

County of: MIDDLESEX

APPLICATION FOR FINAL PAYMENT

The undersigned hereby certifies that the amount owed set forth below constitutes the entire value of all work performed and services rendered by, through or under the undersigned with respect to the project not heretofore paid for up to and including the period covered by the above Application for Final Payment; that all work covered by such Application has been incorporated into the project and title thereto has passed to the OWNER free and clear of all liens, claims, security, interests or encumbrances; and that no work covered by such Application has been acquired subject to an agreement under which any interest therein or an encumbrance thereon is retained by the seller or any other person. In consideration of payment of the requisition, the undersigned hereby releases the OWNER from all claims of lien which the undersigned has regarding the Project.

The undersigned, in order to induce the OWNER to pay the requisition, hereby represents that it has paid or will pay from the proceeds of the requisition all sums due to those parties who have performed work or provided materials to the undersigned in connection with the Project, and that it will on request of the OWNER provide written evidence of the discharge by the undersigned of its obligations to such parties.

Executed under seal as of this _____ day of _____ 20_____.

Amount Owed to CONTRACTOR by
OWNER as Final Payment:

CONTRACTOR:

\$ _____

Duly Authorized

Amount Unpaid From Previous
Application for Payment:

\$ _____

SECTION 01701

CONTRACTOR'S FINAL
LIEN WAIVER
(Con't)

Then personally appeared, the above named _____
and acknowledged the foregoing to be the free act and deed of the above named CONTRACTOR,
before me.

Subscribed and sworn to on the _____ day of _____, 20_____.

Notary Public: _____

My Commission Expires: _____

END OF SECTION

SECTION 01712

FINAL CLEANING

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Final cleaning of project.
- B. Executing final cleanings prior to inspection for Substantial Completion and Final Completion of the Work.

PART 2 PRODUCTS

2.01 CLEANING MATERIALS

- A. Use materials which will not create hazards to health or property, and which will not damage surfaces.
- B. Use only materials and methods recommended by manufacturer of material being cleaned.

PART 3 EXECUTION

3.01 CLEANING

- A. In addition to removal of debris and cleaning specified in other sections, clean interior and exterior exposed-to-view surfaces.
- B. Remove temporary protection and labels not required to remain.
- C. Clean finishes free of dust, stains, films and other foreign substances.
- D. Clean transparent and glossy materials to a polished condition; remove foreign substances. Polish reflective surfaces to a clear shine.
- E. Clean permanent filters of ventilating equipment and replace disposable filters when units have been operated during construction; in addition, clean ducts, blowers, and coils when units have been operated without filters during construction.
- F. Remove waste, foreign matter, and debris from roofs, gutters, area ways, and drainage systems.
- G. Remove waste, debris, and surplus materials from site. Clean grounds; remove stains, spills, and foreign substances from paved areas and sweep clean. Rake clean other exterior surfaces.

END OF SECTION

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Maintaining and submitting record documents and samples.

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Maintain at the site for OWNER one record copy of:

1. Contract Drawings.
2. Specifications.
3. Addenda.
4. Change Orders and other modifications to the Contract.
5. Accepted shop drawings, product data, and samples.
6. Field test records.
7. Inspection certificates.
8. Manufacturer's certificates.

- B. Store record documents and samples in the CONTRACTOR'S office apart from documents used for construction. Provide files, racks, and secure storage for record documents and samples.
- C. Label and file record documents and samples in accordance with section number listings in Table of Contents of this Specification. Label each document "PROJECT RECORD" in neat, large, printed letters.
- D. Maintain record documents in a clean, dry and legible condition. Do not use record documents for construction purposes.
- E. Keep record documents and samples available for inspection by ENGINEER.

1.03 RECORDING

- A. Contract Drawings and Shop Drawings: Legibly mark each item to record actual construction, including:

1. Measured depths of elements of foundation in relation to finish first floor datum.
2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of construction.
4. Field changes of dimensions and details.
5. Changes made by modifications.
6. Details not on original Contract Drawings.

7. References to related shop drawings and modifications.
- E. Specifications: Legibly mark each item to record actual construction, including:
 1. Manufacturer, trade name and catalog number of each product actually installed, particularly optional items and substitute items.
 2. Changes made by addenda or modifications.
- F. Other Documents: Maintain manufacturer's certifications, inspection certifications, and field test records, required by individual Specification sections.

1.04 SUBMITTALS

- A. At Contract closeout, deliver record documents and samples as specified in Section 01701, to ENGINEER for use in the preparation of Project Record Drawings.
- B. Transmit with cover letter in duplicate, listing:
 1. Date.
 2. Project title and number.
 3. CONTRACTOR'S name, address, and telephone number.
 4. Number and title of each Record Document.
 5. Signature of CONTRACTOR or authorized representative.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

DIVISION 2 – SITE WORK

DIVISION 2 - SITE WORK

- 02006 - Uniformed Traffic Officer
- 02140 - Dewatering
- 02160 - Excavation Support
- 02200 - Earthwork
- 02525 - Pavements, Walks, and Curbing
- 02730 - Sanitary Sewers & Force Mains
- 02755 - Existing Sewer Manhole Modifications and Frame & Cover Replacement
- 02766 - Control of Wastewater Flow
- 02925 - Loaming and Seeding
- 02990 - Miscellaneous Work and Cleaning Up

SECTION 02006

UNIFORMED TRAFFIC OFFICER

PART 1 GENERAL

1.01 WORK INCLUDED

A. The CONTRACTOR shall provide Uniformed Traffic Officers from the Town of Maynard.

PART 2 PRODUCTS

2.01 GENERAL

A. The CONTRACTOR shall furnish all necessary barricades, lighting, signals, signs, and traffic control devices as ordered by the Uniformed Traffic Officer and the ENGINEER. The CONTRACTOR shall also be responsible for the employment of the Uniformed Traffic Officers.

PART 3 EXECUTION

3.01 GENERAL

A. All work in, upon, under, or across public streets and roads shall be accordance with the permit granted by the governing authority. The CONTRACTOR shall work with the OWNER to obtain the required permits.

B. The CONTRACTOR shall employ Uniformed Traffic Officer(s) on any highway or street whether under state or local jurisdiction, when, in the opinion of the OWNER, the ENGINEER, the local Police Department, or the Highway Official, public safety or convenience requires. These services will be required, at a minimum, where normal two-way traffic is reduced to one lane and where interference with the normal traffic flow pattern can be expected, such as equipment entering, leaving or crossing roads.

C. The CONTRACTOR shall make all arrangements with the local Police Department to obtain police assistance and shall pay all expenses incurred, including the wages of the police officers. The CONTRACTOR shall be required to employ flagging personnel to assist and/or supplement the uniformed traffic officer(s). The bid item for Police / Fire Details is for payment of the cost of Uniformed Traffic Officers. Flagging personnel, if utilized by the CONTRACTOR, will be paid for under this item.

D. The CONTRACTOR shall setup, maintain and remove all needed barricades, lighting, signals, signs, and traffic control devices on a daily basis as directed by the Uniformed Traffic Officer or the ENGINEER.

E. The intent is to ensure public safety by Police direction of traffic. Police are not to serve as watchmen to protect the CONTRACTOR'S equipment and materials.

F. Nothing contained herein shall be construed as relieving the CONTRACTOR of any of his responsibilities for protection of persons and property under the terms of the Contract.

3.02 REMOVAL

- A. Upon completion of the work, the CONTRACTOR shall remove and dispose of all temporary materials and construction required under this Section.
- B. All areas and utilities shall be restored to original or specified conditions at the completion of the Work.

END OF SECTION

SECTION 02140

DEWATERING

PART 1 GENERAL

1.01 SYSTEM PERFORMANCE REQUIREMENTS

- A. Dewatering shall include all necessary control and disposal of groundwater on a continual basis during construction. Groundwater is expected to be encountered during construction.
- B. Dewatering shall include the lowering of the groundwater table to relieve any hydrostatic head that could cause a decrease in the stability of the excavated subgrade. It shall also include the intercepting of seepage which could otherwise emerge from the slope or sides of excavations which could cause a decrease in the stability of the excavated subgrade or the slopes or sides of the excavations.
- C. Dewatering shall be performed during construction to temporarily protect against the following:
 - 1. The loss of any material beneath the excavated subgrade or from the slopes or sides of the excavations or the movement of any fine particle materials from the soil.
 - 2. Any increased vertical or lateral loads on the excavation support systems.
 - 3. Any disturbance, rupture, instability, boiling or heaving of the bottom of excavated subgrade during:
 - a. Excavation.
 - b. Placement of foundation or bedding materials.
 - c. Construction of slabs, footings, pipes, conduits, under-drains and any other structures.
 - d. Backfilling operations.
- D. Monitoring of dewatering systems shall include furnishing, installing and operating observation wells, and performing and recording observations of water levels in the observation wells.

1.02 ADDITIONAL PROVISIONS

- A. Provide, operate and maintain any dewatering system required to lower and control groundwater levels and groundwater hydrostatic pressure during the construction of the Work as required by this Section and the Contract Documents. The CONTRACTOR shall assume full responsibility and expense for the adequacy of the dewatering system with no additional time for performance.
- B. Remove and dispose of water resulting from activities described in paragraph 1.02 A. Provide siltation settling basins for all discharges from dewatering systems. Submit plan of settling basins and discharge facilities for review by ENGINEER prior to dewatering system installation.
- C. Remove dewatering systems and equipment when no longer required.

- D. Construct, maintain and perform observations of groundwater observation wells as directed by the ENGINEER. Remove or fill observation wells as required, except where the ENGINEER directs that observation wells are to remain in place.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

3.01 EXECUTION

- A. The dewatering system shall be capable of developing an excavated subgrade relieved of any hydrostatic pressure that could cause a decrease in the stability of the excavated subgrade and which will provide the necessary groundwater control for the proper performance required for completion of the Work.
- B. The dewatering system shall not cause damage to newly constructed or existing properties, buildings, utilities, and other work due to the loss of support from incompletely drained soils or from removal of soil particles resulting from the dewatering system operation.
- C. Dewatering facilities shall be located where they will not cause interference with work performed by others.
- D. If the dewatering system utilized by the CONTRACTOR causes or threatens to cause damage to new or existing facilities, the dewatering system shall be modified at no additional cost to the OWNER. The CONTRACTOR shall be responsible for and shall repair all damage caused by the dewatering system operation at no additional cost to the OWNER and at no additional time for performance.
- E. Dispose of subsurface water collected in a manner which conforms to all applicable local and state ordinances, statutes, and laws.
- F. Maintain continual and complete effectiveness of the dewatering system operation to 18" below excavation to provide a firm, stable, excavated subgrade at all times as required for proper performance of the Work.
- G. Provide dewatering necessary to maintain the groundwater table below the level of backfill as it is being placed. The groundwater table shall also be maintained at a level which will not result in uplift pressure in excess of 80% of the downward pressure produced by the weight of the structure and any backfill in place.

3.02 JOB CONDITIONS

- A. Erosion Control: Provide adequate protection from erosion from any of the dewatering operations utilized during the course of the construction. Any damage, disruption, or interference to newly constructed work or existing properties, buildings, structures, utilities and/or other work resulting directly or indirectly from dewatering operations conducted under this Contract shall be remedied by the CONTRACTOR, at no cost to the OWNER.
- B. Treatment of Dewatering Operations Discharges: Provide such additional treatment devices as may be required to meet the provisions of the Contract. This may include the construction of sumps and/or settling basins, stone rip-rap, silt fences or other requirements. The treatment devices shall be later removed and/or filled in with acceptable backfill material and restored to original conditions once they are no longer needed, at no additional cost to the OWNER.

END OF SECTION

SECTION 02160

EXCAVATION SUPPORT

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Designing, furnishing, installing, maintaining, and removing excavation support systems for the following:
 - 1. Excavation.
 - 2. Trench excavation.

1.02 REFERENCE STANDARDS

- A. ASTM A328 - Steel Sheet Piling.
- B. NFPA - National Forest Products Association.

1.03 SYSTEM DESCRIPTION

- A. The construction of the excavation support systems shall include soldier piles, lagging, trench boxes, wood sheeting and steel sheeting, including bracing members such as walers, struts, shores and tieback anchors and all other system members.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Wood: Tongue and groove; #3 common Douglas Fir or Hemlock; or Utility Grade Southern Pine; NFPA grading.
- B. Steel: ASTM A328.
- C. Trench Boxes: Fabricated steel.

PART 3 EXECUTION

3.01 EXECUTION

- A. The CONTRACTOR shall be totally responsible for the means and methods of excavation and for the design and construction of the excavation support systems.
- B. The support system shall be designed to support the maximum loads that will occur during construction.
- C. Excavation support systems shall be constructed so as to be able to support all vertical and lateral loads and other surcharge loads imposed on the system during construction including earth pressures, utility loads and other surcharges and construction loads in order to provide safe construction of the permanent structures and prevent movement and/or damage to adjacent soil, buildings, structures, and utilities.

- D. Do not brace to concrete unless authorized by the ENGINEER, and then only if concrete has reached its design strength as determined by compressive test of representative concrete cylinders which have been cured on site for a period of at least 14 days.
- E. Do not embed any part or portion of excavation support system in the Work. Do not construct sleeves or openings in the structures to permit bracing through the structures unless authorized by the ENGINEER.
- F. The CONTRACTOR shall not perform excavations in unstable earth. Stabilize all earth materials behind support walls before excavation is allowed to proceed.
- G. The CONTRACTOR shall monitor all excavations and provide a means of determining movement of adjacent soil, buildings, structures, and utilities.
- H. Where movement or damage is observed, the CONTRACTOR shall immediately cease excavation operations and correct such deficiency in the excavation support system that allowed for movement or damage and repair all damage at no additional cost to the OWNER and at no additional time for performance.
- I. The CONTRACTOR shall be responsible for and shall repair all damage resulting from his excavations and at no additional cost to the OWNER and at no additional time for performance.

3.02 SHEETING LEFT-IN-PLACE

- A. Cut off all sheeting left-in-place at least three feet below the ground surface, whether such sheeting is ordered left in place by the ENGINEER or is left in place for the convenience of the CONTRACTOR.

3.03 MEASUREMENT AND PAYMENT

- A. Subsidiary to all Bid Items.

END OF SECTION

SECTION 02224

TRENCHING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Saw cutting pavement and excavating pavement.
- B. Excavating utility trenches and stockpiling topsoil and subsoil for later use.
- C. Excavating rock, boulders, solid rubble masonry and Portland cement concrete that is less than one cubic yard in volume.
- D. Excavating unsuitable material from trenches.
- E. Placing bedding (select fill material) under utilities.
- F. Backfilling trenches with common fill materials.
- G. Replacing excavated unsuitable material and excavated rock in utility trenches with select fill material or common fill material.
- H. Complying with compaction requirements.
- I. Removing and disposal of excess topsoil and subsoil, excavated unsuitable material, and excavated pavement, rock, boulders, solid rubble masonry and Portland cement concrete from site.

1.02 REFERENCE STANDARDS

- A. ASTM C33 - Concrete Aggregates.
- B. ASTM C136 - Sieve Analysis of Fine and Coarse Aggregates.
- C. ASTM D75 - Sampling Aggregates.
- D. ASTM D1556 - Test for Density of Soil in Place by the Sand Cone Method.
- E. ASTM D1557 - Tests for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 10-lb Rammer and 18-inch Drop (Modified Proctor).
- F. ASTM D2167 - Tests for Density of Soil in Place by Rubber Balloon Method.
- G. ASTM D2922 - Tests for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

1.03 SAMPLES

- A. Submit samples in accordance with Section 01340. Samples shall be obtained in accordance with ASTM D75.
- B. Submit in air-tight containers, 25-lb sample of each type of material to be tested, to ENGINEER.

1.04 TESTING

- A. Tests and analysis of bedding/backfill materials will be performed in accordance with Section 01340 and the methods in ASTM C136.
- B. The ENGINEER shall arrange for and pay for all testing required. Testing shall be by a laboratory approved by the Engineer.

1.05 PROJECT RECORD DOCUMENTS

- A. Accurately record location of utilities remaining, rerouted utilities, and new utilities by horizontal dimensions, elevations or inverts, and slope gradient.
- B. Provide records of utility locations to ENGINEER prior to substantial completion.

PART 2 PRODUCTS

2.01 MATERIALS - GENERAL

- A. Topsoil: Material excavated on site, which is friable, fertile, natural, free-draining loam typical of the locality; free of subsoil, roots, grass, sticks, weeds, clay, sod lumps, debris and stones larger than 1 inch in maximum dimension. Soil shall not be excessively acid or alkaline, nor contain toxic material harmful to plant growth.
- B. Unsuitable Material: Cut or broken pavement, debris, concrete or other rubble, organic materials; muck, peat, silty soils or clayey soil; rock over 6 inches in maximum dimension; or any material which in the opinion of the ENGINEER will not provide sufficient support or maintain the completed construction in a stable condition.

2.02 COMMON FILL MATERIALS

- A. Subsoil: Material excavated on site, which is friable, natural soil composed of gravel, sand, or silty or clayey gravel and sand; free from debris, concrete or other rubble, organic matter, muck, peat, excavated rock and boulders over 6 inches in maximum dimension.
- B. Additional Fill: Imported material, which is friable, natural soil composed of gravel, sand, or silty or clayey gravel and sand; free from debris, concrete or other rubble, organic matter, muck, peat, excavated rock and boulders of 6 inches in maximum dimension.

2.03 SELECT FILL MATERIALS

- A. Gravel Borrow: Material excavated from a suitable gravel bank and consisting of stones, rock fragments and fine durable particles resulting from natural disintegration of rock; meeting the following limits when tested in accordance with ASTM C136:

<u>Sieve Designation</u>	<u>Percentage by Weight Passing Square Mesh Sieve</u>
	<u>TOTAL SAMPLE</u>
(Maximum size - 3 inches)	
1/2-inch	50 - 85
No. 4	40 - 75
No. 50	8 - 20
No. 200	0 - 10

B. Concrete Sand: Clean, hard durable grains; free from silt, topsoil, clay, and organic matter; uniformly graded from coarse to fine meeting the following limits when tested in accordance with ASTM C136:

<u>Sieve Designation</u>	Percentage by Weight Passing Square Mesh Sieve <u>TOTAL SAMPLE</u>
3/8-inch	100
No. 4	95 - 100
No. 16	55 - 80
No. 50	10 - 25
No. 100	2 - 8
No. 200	0 - 3

C. Sand: 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 AASHTO-T11 shall not exceed 10% by weight.

The maximum particle size for sand borrow shall be as follows:

Type a	1/4-inch
Type b	3/8-inch

D. Crushed Gravel: Clean, hard crushed gravel; free from silt, topsoil, clay, and organic matter; uniformly graded from coarse to fine within the following limits when tested in accordance with ASTM C136:

<u>Sieve Designation</u>	Percentage by Weight Passing Square Mesh Sieve <u>TOTAL SAMPLE</u>
2-inch	100
1-1/2-inch	90 - 100
No. 4	30 - 60
No. 100	0 - 12
No. 200	0 - 6

E. Dense Graded Crushed Stone: Clean mineral aggregate meeting the following limits when tested in accordance with ASTM C136:

<u>Sieve Designation</u>	Percentage by Weight Passing Square Mesh Sieve <u>TOTAL SAMPLE</u>
3/4-inch	100
1-1/2-inch	70 - 100
3/4-inch	50 - 85
No. 4	30 - 55
No. 50	8 - 24
No. 200	3 - 10

F. Subbase Gravel: Clean mineral aggregate meeting the following limits when tested in accordance with ASTM C136:

<u>Sieve Designation</u>	Percentage by Weight Passing Square Mesh Sieve <u>TOTAL SAMPLE</u>
3-inch	100
1-1/2-inch	70 - 100
1/4-inch	50 - 85
No. 4	30 - 60
No. 200	0 - 10

Maximum stone size shall be 3 inches in the largest dimension.

G. Crushed Stone: Clean, hard, durable crushed particles or fragments of stone or rock of uniform quality; free from thin and elongated pieces, silt, topsoil, clay, and organic matter; meeting the following limits in accordance with ASTM C33 stone size No. 67 when tested in accordance with ASTM C136.

<u>Sieve Designation</u>	Percentage by Weight Passing Square Mesh Sieve <u>TOTAL SAMPLE</u>
1-inch	100
3/4-inch	90 - 100
3/8-inch	20 - 55
No. 4	0 - 10
No. 8	0 - 5

H. Structural Fill: Clean, free-draining granular material; free from silt, topsoil, clay, and organic matter; meeting the following limits when tested in accordance with ASTM C136:

<u>Sieve Designation</u>	Percentage by Weight Passing Square Mesh Sieve <u>TOTAL SAMPLE</u>
3-inch	100
2-1/2-inch	90 - 100
No. 4	50 - 75
No. 100	0 - 12
No. 200	0 - 6

2.04 FILTER FABRIC

A. Filter fabric shall be Mirafi 140N. Substitution of a product equal or better quality, detail, function and performance may be proposed for substitution by following the procedures in Section 01630.

PART 3 EXECUTION

3.01 PREPARATION

- A. Request available information on existing utilities and structures from ENGINEER.
- B. Identify required lines, levels, contours, and datum.
- C. Identify known underground utilities. Stake and flag locations.
- D. Identify and flag surface and aerial utilities.

- E. Notify utility companies to locate and temporarily support, remove, and/or relocate facilities.
- F. Notify DIG-SAFE (811).

3.02 PROTECTION

- A. Protect trees, shrubs, lawns, and other features remaining as a portion of final landscaping.
- B. Protect bench marks, existing structures, fences, stone walls, sidewalks, paving and curbs from equipment and vehicular traffic.
- C. Protect above and below grade utilities and structures which are to remain.
- D. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave-in or loose soil from falling into excavation in accordance with Section 02160.
- E. Underpin adjacent structures which may be damaged by excavation work, including service utilities and pipe chases.
- F. Protect bottom of excavations and soil adjacent to and beneath foundations from frost.

3.03 PAVEMENT EXCAVATION

- A. All pavement shall be cut with saws or approved power tools prior to removal.
- B. Cut pavements sufficiently wide and remove to enable installation of pipe and allow inspection. Pavement cutting shall be done by saw cut pavement breaker or wheel cutter of sufficient size to properly penetrate the total thickness of the pavement. Cutting shall be made in a neat, true, straight line established by chalk line or painting of existing pavement. All cutting methods will be approved by the Engineer before any pavement cutting begins. Disposal of excavated pavement is the responsibility of the Contractor.
- C. Keep excavated pavement separate from topsoil and subsoil stockpiles.
- D. Remove and dispose of pavement excavated from site.

3.04 EXCAVATION - GENERAL

- A. Excavate topsoil and subsoil to the limits shown on the Drawings and stockpile.
- B. Stockpile excavated material to be reused and remove and dispose of unsuitable subsoil and excess material not being reused, off site. Topsoil and subsoil suitable for reuse shall be in conformance with paragraph 2.01 A. (Topsoil) and 2.02 A. (Subsoil). Stockpiled soil shall be protected from erosion.
- C. Remove all muck, peat or other unsuitable material within trench limits. If unsuitable material exists at limits of trench shown on Drawings, obtain excavation authorization from ENGINEER prior to removal of material. Unauthorized excavation of unsuitable material will not be considered for payment. Excavated unsuitable material shall be replaced with backfill material as specified.
- D. Notify ENGINEER of unexpected subsurface conditions, discovery of unknown utilities or concealed conditions, and discontinue affected work in area until notified to resume work. Unexpected subsurface conditions do not include those conditions identified in the Contract Documents.

- E. Slope sides of trench excavation to satisfy OSHA requirements or install excavation support system in accordance with Section 02160.
- F. Trench excavation shall not interfere with normal 45 degree bearing influence of any foundation.
- G. Grade top perimeter of excavations to prevent surface water run-off into excavation.
- H. When excavation through roots is necessary, cleanly cut roots.
- I. Excavation shall be free of loose matter.
- J. Correct unauthorized excavation at no additional expense to OWNER. Backfill with material acceptable to ENGINEER.
- K. Maintain all trench excavations stable, dry and free of water on a continual basis during excavation, pipe placement and backfilling in accordance with Section 02140.

3.05 BACKFILLING PREPARATION

- A. Remove all water, snow, ice and debris from excavations and trenches before placing pipe bedding, foundation material under tankage or concrete structures or backfilling.
- B. Compact subgrade surfaces disturbed by construction operations to density requirements for backfill material. Do not place bedding, foundation material or backfill on porous, unstable or unsuitable subgrade.

3.06 BEDDING AND BACKFILLING

- A. Bedding and backfilling materials shall not contain frozen materials, ice, or snow.
- B. Backfill with crushed gravel areas beneath pipe from which rock, boulders, or unsuitable bearing material has been removed.
- C. Install pipe on shaped, undisturbed subgrade or on bedding material in accordance with paragraph 3.09 SCHEDULE OF BEDDING, BACKFILLING AND COMPACTION.
- D. Support pipe during placement and compaction of bedding material.
- E. Filter fabric shall be placed to completely enclose crushed stone used for bedding material or for replacement material where rock, boulders or unsuitable material have been removed only where authorized by the ENGINEER.
- F. Place and compact bedding for utilities and yard piping in accordance with the specifications and typical trench details shown on the Drawings.
- G. Backfill trenches to depths, contours and elevations required.
- H. Each layer of fill shall be compacted to the specified density immediately after it is placed.
- I. Maintain optimum moisture content of backfill materials to attain required compaction density.
- J. Fill that is too wet for proper compaction shall be disced, harrowed or otherwise dried to a proper moisture content for compacting to the required density. If the fill material cannot be dried within 48 hours of placement, it shall be removed and replaced with drier fill.

- K. Fill that is too dry for proper compaction shall be watered uniformly over the surface of the loose layer. Sufficient water shall be added to allow compaction to the required density.
- L. Employ placement and compaction methods that will not disturb or damage Work or existing structures or utilities. Disturbed or damaged Work, structures or utilities shall be repaired, at no additional cost to the OWNER and at no additional time for performance.
- M. Backfilling shall be performed as required to avoid interference with OWNER'S operations and/or other contractor's or subcontractor's Work.

3.07 COMPACTION

- A. The maximum density at optimum moisture content for backfill materials shall be determined in accordance with ASTM D1557 (Modified Proctor).
- B. All backfill materials shall be compacted to the density shown in paragraph 3.06 SCHEDULE OF BACKFILL AND COMPACTION.
- C. Testing density of soil in place (compaction) will be performed in accordance with ASTM D1556, ASTM D2167 or ASTM D2922. If tests indicate backfill does not meet specified requirements, remove, replace and retest at no additional cost to OWNER and at no additional time for performance.

3.08 TOLERANCES

- A. Top Surface of Backfilling: Plus or minus one inch.

3.09 SCHEDULE OF BEDDING, BACKFILL AND COMPACTION

- A. The following schedule identifies location; bedding and/or backfill materials to be used (identified from upper to lower fill type); loose thicknesses of each fill lift; and, compaction expressed as a percentage of maximum density and optimum moisture determined in accordance with ASTM D1557 (Modified Proctor).

<u>Location</u>	<u>Material/Thickness</u>	<u>Lifts (Loose)/Compaction</u>
<u>Pipe Bedding</u>		
• DI Water Pipe	Shaped, Undisturbed Subgrade/Existing	Existing/ 95 percent or equal to average density of undisturbed material.
• PVC Water Pipe, DI Gravity Sewer, PVC	3/4" Crushed Stone/6" inches min. below pipe to springline of pipe	6 inch lifts/ 95 percent
<u>Gravity Sewer and PVC Sewage Force Main</u>		
• RCP Storm Drain	Shaped, Undisturbed Subgrade/Existing	Existing/ 95 percent or equal to average density of undisturbed material
• All Pipe in Area of Rock Excavation	3/4" Crushed Stone/6 inches min. below pipe to springline of pipe	6-inch lifts/ 95 percent

- All Pipe in Area of Unsuitable Material Excavation

Crushed Gravel/As req'd, 6 inches min. from excavation limits below pipe to springline of pipe

6-inch lifts/
95 percent

Pipe Blanket

- DI Water Pipe and DI Sewage Force Main

Common Fill/From trench bottom to 12 inches above pipe

6-inch lifts/
95 percent

<u>Location</u>	<u>Material/Thickness</u>	<u>Lifts (Loose)/Compaction</u>
• PVC Water Pipe, DI Gravity Sewer, PVC Gravity Sewer and PVC Sewage Force Main	Sand/From springline of pipe to 12 inches above pipe	6-inch lifts/ 95 percent
• RCP Storm Drain	Common Fill/From trench bottom to 12 inches above pipe	6-inch lifts/ 95 percent

Backfill

- Under Grassed Areas
- Under landscaped areas
- Under paved areas

Common Fill/From subgrade or 12 inches above pipe, to 4 inches below finished grade

Common Fill/From subgrade or 12 inches above pipe to 12 inches below finished grade

Common Fill/From subgrade or 12 inches above pipe to underside of subbase for paved areas

15-inch lifts/
90 percent

15-inch lifts/
90 percent

6-inch lifts/
90 percent

Subbase

Bituminous Pavement Base

Crushed Gravel/12 inches min.

6-inch lifts/
95 percent

3.10 SURPLUS EXCAVATED MATERIALS

A. No excavated material shall be removed from the site of the work or disposed of by the Contractor except as directed or approved by the Engineer.

- B. Surplus excavated materials shall, with the approval of the Engineer, be used to backfill normal excavations in rock or to replace other materials unacceptable for use as backfill; shall be neatly deposited and graded so as to make or widen fills, flatten side slopes, or fill depressions; or shall be neatly deposited for other purposes indicated by the Owner, within its jurisdictional limits; all as directed or approved and without additional compensation.
- C. Surplus excavated material, other than those suitable for backfill, shall be neatly deposited for other purposes as indicated by the Owner, within its jurisdictional limits, as directed or approved and without additional compensation.
- D. Surplus excavated material not needed as specified above shall be hauled away and dumped by the Contractor; at his expense, at appropriate locations, and in accordance with arrangements made by him.

3.11 MEASUREMENT AND PAYMENT

- A. Subsidiary to all Bid Items.

END OF SECTION

SECTION 02276

GENERAL ENVIRONMENTAL CONTROLS

PART 1 GENERAL

1.01 EXTENT OF WORK

A. The work includes the furnishing of all physical plant, labor, equipment, and materials and performing all operations in connection with the provision of general environmental controls.

1.02 REFERENCES

A. The following standards form a part of these Specifications:

1. American Society for Testing and Materials (ASTM)
 - ASTM D751 Testing Coated Fabrics
 - ASTM D1682 Breaking Load and Elongation of Textile Fabrics
 - ASTM D3786 Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics - Diaphragm Bursting Strength Tester Method
2. Corps of Engineers (COE)
 - COE CWO2215 Geotextiles Used as Filters

PART 2 PRODUCTS

2.01 FILTER FABRIC FOR SILT FENCE

A. Filter fabric for silt fence shall consist of previous sheets of woven propylene, nylon, polyester, or ethylene yarn. Material shall be certified by the manufacturer to meet the following requirements.

Physical Requirements for Fabric Silt Fence

<u>Property</u>	<u>Test Method</u>	<u>Requirement</u>
Tensile Strength	ASTM D 1682	Grab Test 100 lbs. min.
Grab Elongation	ASTM D 1682	Grab Test 30% \pm 10%
Equivalent	Corps of Engineers	100 sieve min.
Opening Size	CW 02215	40 sieve max.
Bursting Strength	ASTM D 751	Diaphragm 175 psi min.

The filter fabric shall contain a stabilizer and/or inhibitors to make the filaments resistant to deterioration resulting from exposure to sunlight or heat and to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 degrees to 120 degrees F. The filter fabric shall be a minimum of 36 inches wide, cut from a continuous roll to finish fence length to minimize the use of seams. Splice

filter fabric together only when absolutely necessary and only at a support post, with a minimum 36-inch overlap and securely sealed. The filter fabric shall be free of defects or flaws which significantly affect its physical and/or filtering properties.

- B. Wire fence reinforcement for fabric silt fences shall be a minimum of 30 inches in height, a minimum of 14 gauge and shall have a maximum mesh spacing of 6 inches. The wire fence reinforcement shall be used with all filter fabrics except those approved for use without a wire fence reinforcement by the manufacturer.
- C. Posts shall be of wood or steel and a minimum of 5 feet 6 inches long for wood and 4 feet 6 inches long for steel. Wood posts shall be at least 3 inches in diameter, or nominal 2 X 4 inches. Steel posts shall be round, U, T or C shaped with a minimum weight of 1.3 pounds per foot and have projections for fastening the wire to the fence.
- D. Wire staples for attaching filter fabric to wooden posts shall be No. 9 gauge and shall be at least one inch long.

2.02 FILTER FABRIC FOR SEDIMENTATION BASINS

- A. Filter fabric for sedimentation basins shall be composed of polypropylene, polyester, nylon, or ethylene fabric yarns which are woven into a stable network such that the yarns retain their relative position. The filter fabric shall be inert to biological degradation and naturally encountered chemicals, alkalis, and acids. The sedimentation basin filter fabric shall conform to the following property values:

<u>Property</u>	<u>Test Method</u>	<u>Requirement</u>
Tensile Strength	ASTM D 1682	Grab Test 400 x 250 lbs
Grab Elongation	ASTM D 1682	Grab Test 30% +- 10%
Equivalent	Corps of Engineers	100 sieve min.
Opening Size	CW 02215	70 sieve max.
Bursting Strength	ASTM D 3786	490 psi

The filter fabric shall contain a stabilizer and/or inhibitors to make the filaments resistant to deterioration resulting from exposure to sunlight or heat and to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 degrees to 120 degrees F. The filter fabric shall be a minimum of 72 inches wide, cut from a continuous roll to finish fence length to avoid the use of seams. Splice filter fabric together only when absolutely necessary and only at a support post, with a minimum 36-inch overlap and securely sealed. The filter fabric shall be free of defects or flaws which significantly affect its physical and/or filtering properties.

- B. Wire fence reinforcements, posts, and wire staples shall be as specified in Paragraph, Filter Fabric for Silt Fences above.

PART 3 EXECUTION

3.01 IMPLEMENTATION

- A. Prior to commencement of the work the CONTRACTOR shall meet with the OWNER and the ENGINEER to clarify the requirements of the environmental control program. Environmental control, protection and restoration are a significant component of the Contract.

3.02 PROTECTION OF LAND RESOURCES AND TREES

A. It is intended that the natural resources within the project boundaries and outside the limits of permanent work performed under this Contract be preserved in their present condition or be restored to a condition after completion of construction that will appear to be natural and not detract from the appearance of adjacent areas.

1. Construction activities shall be confined to areas within the easements and designated staging, storage, and access areas.

B. The removal of vegetation shall be kept to a minimum. The removal of trees which are 4 inches or greater in diameter at breast height shall only occur within the maximum width allowed for the purpose of construction and only when they impede construction.

Tree Protection: The CONTRACTOR shall not deface, injure, remove, cut or otherwise harm any vegetation outside of permanent and temporary construction easement lines shown on the Drawings. CONTRACTOR shall replace all such trees damaged at no cost to OWNER. Wherever limbs of trees overhanging the easements or construction access roads may be injured by trucks or machinery passing under or nearby, they shall be pruned by a professional arborist as directed by the ENGINEER before construction begins. Within the limits of the construction easements there are some trees to be protected and existing trees and shrubs to be transplanted where indicated on the Drawings. Prior to clearing and grubbing the CONTRACTOR shall dig, move, store and maintain vegetation to be transplanted and install Tree Protection Fencing around all trees to be protected.

1. Tree protection fencing shall be wire bound wood roll snow fence 4 feet high staked into the ground at 10 feet o.c. maximum with 7 foot steel posts driven 3 feet into the ground, or other approved fencing. Fencing shall be placed at or beyond the drip-line of the branches. Fencing shall indicate the limit of all construction activity.

2. Where trees to be protected fall within areas where construction traffic must pass, additional tree protection shall be required. Roots shall be completely covered within the drip line of any such trees with planking of sufficient length and thickness to allow construction equipment of all types to pass over without disrupting or compacting the ground surface. The trunk and bark of such trees shall also be protected by adequately wrapping the trunk with sufficient thickness of burlap or rags over which 1 1/2-inch thick softwood cleats shall be securely tied. Nails shall not be driven into trees.

C. Throughout construction, it shall be the responsibility of the CONTRACTOR to maintain all protective fences, wrapping and planking in good repair. Care shall be taken to avoid the build-up of silt over the tree roots by appropriate use of silt fence or haybales. The accumulates to a depth of 1-inch. Tree protection shall be removed during final restoration/replanting in the area.

D. Remedial Maintenance for Trees Damaged During Construction

1. **Construction Pruning:** Construction pruning shall consist of root pruning and pruning the tree crown to compensate for root zone damage caused during trenching operations. Before trenching begins, the limit of trenching shall be staked out for review by the ENGINEER. A small backhoe or trenching machine shall be used to dig near roots to a minimum depth of 36-inches. All exposed roots shall be severed cleanly with a Toppers or saw close to the

soil. The ENGINEER shall determine, with the assistance of a certified arborist as necessary, whether sufficient structural root mass remains after root pruning to assure the stability of the tree, and if not, the tree shall be removed at no additional cost. The crowns of all trees to remain shall be reduced by pruning, by a certified arborist, to the approximate percentage of the remaining root zone. Wherever tree roots will be exposed during construction for longer than three days, they shall be covered with a 3-inch layer of non-toxic, pathogen free organic mulch and kept moist.

2. Wound Tracing: When wounds are inflicted on any tree within or outside of easements lines, the loose bark shall be removed by cutting the bark back to healthy tissue with a sharp knife, tracing the outline of the wound. Wound tracing shall be supervised by a certified arborist.
3. Watering: Additional watering during periods of subnormal rainfall shall be applied at a rate equivalent to 1-inch per week.

D. Vegetation to be Transplanted

1. Vegetation to be transplanted shall be dug by hand or by hydraulic tree spade, or other suitable equipment of sufficient size to remove a size adequate to ensure survival and vigor of the plant.
2. All plants dug to be transplanted shall be immediately moved to a protected stockpile area on the property as approved by the property OWNER and ENGINEER. Plants shall be set plumb on grade or in prepared holes and guyed as necessary. The area of holes shall be backfilled with suitable loam to cover the area entirely and mulched to prevent erosion. All stored vegetation shall be maintained in a damp condition by regular watering. All cultural measures necessary for survival of transplanted vegetation shall be utilized by the CONTRACTOR.
3. Additionally, replacements of existing vegetation to be transplanted shall be of the same species, form and relative size as that which was to be transplanted. Replacement of plants not successfully transplanted shall be at no additional cost to the OWNER.

E. The location of the CONTRACTOR's storage and other construction buildings shall be at designated portions of the job site. The preservation of the landscape shall be an imperative consideration in the selection of all sites and in the construction of buildings. Plans showing all storage facilities shall be submitted for approval of the ENGINEER.

F. If the CONTRACTOR proposes to construct temporary roads or embankments and excavations for plant and/or work areas in addition to those shown on the Drawings, he shall submit the following for approval at least ten (10) working days prior to the scheduled start of such temporary work:

1. A layout of all temporary roads, excavations, and embankments to be constructed within the work area.
2. Details of road construction.
3. Plans and cross sections of proposed embankments and their foundations, including a description of proposed materials.

4. A landscaping plan showing the proposed restoration of the area. Removal of any necessary trees and shrubs outside the limits of existing clearing area shall be indicated. The plan shall also indicate location of required guard posts or barriers required to control vehicular traffic passing close to trees and shrubs to be maintained undamaged. Modification of the CONTRACTOR's plans shall be made only with the written approval of the ENGINEER.
- G. The CONTRACTOR shall destroy and/or remove and properly dispose of all signs of temporary construction facilities such as haul roads, work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, or any other indication of construction. It is anticipated that excavation, filling, grading, loaming and planting will be required to restore the areas to near natural conditions which will permit the growth of vegetation thereon. Finish grades shall conform to original grades, unless indicated otherwise on the Drawings.

3.03 PROTECTION OF AIR RESOURCES

- A. During the progress of the work, the CONTRACTOR shall conduct his operations and maintain the area of his activities, including sweeping and sprinkling of water as necessary, so as to minimize the creation and dispersion of dust. The use of Calcium Chloride or salt shall not be permitted within any Wetland Area (WA), Buffer Zone (BZ) or aquifer protection zone. If the ENGINEER decides that it is necessary to use calcium chloride for more effective dust control outside of the WA, BZ and aquifer protection zone then the CONTRACTOR shall furnish and apply the material as specified herein. Dust control in WA, BZ and aquifer protection zone shall be accomplished by periodic wetting.
- B. Calcium chloride shall be commercial grade, furnished in 100 lb., 5-ply bags, stored under weatherproof cover and stacked alternately for ventilation. Application for dust control shall be at the rate of about 1/2 pound per square yard per application, unless otherwise directed by the ENGINEER.
- C. Burning of rubbish and waste material on the site shall not be permitted.
- D. Construction equipment shall be well maintained and equipped with properly operating emission control devices. Equipment not utilizing said devices, leaking fuel, fluids or operating inefficiently, shall be removed immediately from the site.

3.04 HAZARDOUS MATERIAL AND WASTE CONTROL

- A. Disposal of volatile fluid wastes (such as hydraulic fluids, waste oil, gasoline, fuel or paint thinner) onto the ground, in storm or sanitary sewer systems or into streams or waterways shall not be permitted. In the event that any such waste is spilled, the CONTRACTOR shall promptly clean up the spillage and all contaminated soil and dispose of the cleanings as hazardous waste material. If a spill occurs, the clean-up activities shall take precedence over normal construction activities in order that damage to the environment is minimized.
- B. Fuels, lubricants, or other hazardous materials shall not be stored in any Wetland Area. In addition, the storage of hazardous materials in an Aquifer Protection Zone is prohibited.

- C. Fuel, lubricants, and other hazardous materials shall be stored in approved containers within an area of positive containment. The area shall have no open communication with surface water bodies or other resource areas, shall have a base of relatively impermeable materials required for a 100-gallon spill. In addition, prior to the commencement of construction, a plan for action in the event of a hazardous waste spill shall be submitted to the Local Conservation Commission.
- D. Whenever possible, refueling and lubricating shall take place within the confines of the fuel storage section of a staging area. Where this is not feasible due to distances between staging areas, the refueling truck shall be equipped with impermeable plastic sheeting and speed-dry absorbent. The equipment to be refueled shall be placed upon the plastic sheeting and then refueled/lubricated. Alternatively, an inverted "tent" of plastic shall be placed beneath the fuel tank of the equipment to be refueled or a boom shall be placed surrounding the equipment. If none of these methods are feasible or no alternative method is approved in advance by the Local Conservation Commission, the equipment must be removed from the Wetland Area.
- E. All hazardous materials containers shall be properly marked, and their contents identified. All fuel oil, lubricant, gasoline, and hydraulic fluid containers shall be fixed in place on the transport vehicle when the vehicle is in motion.
- F. The construction project shall be in compliance with all federal, state, and local laws with respect to hazardous materials and all clean-up and disposal operations shall comply with all applicable federal, state, and local statutes, regulations, ordinances and anti-pollution laws.

3.05 SEDIMENTATION AND EROSION CONTROL

- A. The CONTRACTOR shall plan and execute all operations, particularly those associated with excavation and backfilling, in such a manner as to minimize the amount of excavated and exposed fill or other foreign material that may be washed or otherwise carried into waterways. The ambient turbidity of watercourses to be traversed, and watercourses within 100 feet of any construction activity shall be measured immediately prior to construction in the area. Turbidity shall be measured in NTU (Nephelometric Turbidity Units). During construction in the area, turbidity shall be measured on a daily basis. Approximately one hour after commencement of construction activities, mitigation measures (including the cessation of construction) shall be immediately taken to reduce elevated turbidity levels (greater than 10% increase in NTU over pre-construction ambient levels) unless it can be demonstrated to the satisfaction of the Local Conservation Commission that the elevated turbidity levels are caused by factors not related to construction. Additionally, the effluent from sedimentation basins shall be monitored at the same intervals and shall not exceed 5 NTU. Alternatively, the depth of the photic zone (as measured by a Secchi Disk) shall not decrease by more than ten percent due to construction in, or adjacent to, watercourses. Either the turbidity standard or the photic zone standard set forth above may be superseded by a standard more appropriate to the conditions upon approval by the ENGINEER which may prevail immediately prior to construction.
- B. The CONTRACTOR shall furnish and place hay bales, silt fencing and other materials necessary for sedimentation and erosion control for the rivers, brooks, streams, and wetlands as detailed on the Drawing and as directed by the ENGINEER.
- C. Hay bales shall consist of hay from acceptable grasses and legumes, free from weeds, reeds, twigs, chaff, debris, other objectionable material or excessive amounts of seeds and grain. Hay shall be free from rot or mold and the moisture content shall not exceed fifteen (15) percent by weight at the time of installation. The hay bales shall be securely baled with wire of adequate size to remain secure while in use and

- D. to permit rehandling when the bale is in a saturated condition.
It is the intent of these Specifications to prevent the unnecessary occurrence of sedimentation or siltation of all affected rivers, streams, brooks, and their various impoundments. In the event the sedimentation or siltation prevention measures used by the CONTRACTOR prove to be inadequate as determined by the ENGINEER, the CONTRACTOR shall clean up the affected area and be required to adjust his operation to the extent necessary to prevent any such sedimentation or siltation from re-occurring.
- E. The CONTRACTOR shall keep the work area rivers, streams, brooks, and other water crossings clear of mud, silt, debris and other objectionable materials resulting from his construction operations.
 - 1. The CONTRACTOR shall maintain flow capacity of all water courses to prevent unnatural flooding due to the CONTRACTOR's operations.
- F. The CONTRACTOR shall use temporary vegetation, soil stabilization matting, and mulching to protect areas exposed during construction. He shall minimize the amount of bare earth exposed at any one time during construction, and he shall also minimize the length of time bare earth is exposed. Excavated material to be stockpiled for reuse shall be stored away from the river and/or WA to prevent the washing of same back into the river and/or WA.
- G. Baled hay shall be placed to form temporary water filters, dams, diversions, dikes, berms and for other uses connected with water pollution control. Should any bales become too clogged to be effective, they shall be removed from the site and new hay bales provided as directed by the ENGINEER. Bales shall be replaced as often as necessary to provide effective sediment control. Following completion of construction activities, bales shall be legally disposed of, by the CONTRACTOR, off-site in an environmentally sound manner.
- H. On sloping terrain, hay bales may be used to trap sediment until vegetation has become established. The details of their placement shall be as approved by the ENGINEER.
 - I. Sediment laden water that is being pumped from the trenches or excavations shall not be pumped directly into water courses. Sedimentation basins of filter fabric, wire fencing and hay bales as shown on the Drawings or other means acceptable to the ENGINEER shall be used for this purpose. The discharge from sedimentation basins shall conform to the requirements of Part A., hereinbefore.
 - J. Spoil resulting from the trench excavation shall be removed to permit entry of water from adjacent land surfaces without excessive erosion or harmful ponding.

3.06 SILT FENCE MAINTENANCE

- A. The silt fence shall be maintained at no additional cost to the OWNER as follows: Inspect silt fences and filter barriers on a weekly basis; immediately after each rainfall and at least daily during prolonged rainfall. Provide any required repairs immediately. Should the fabric on a fabric silt fence decompose or become ineffective prior to the end of the expected usable life and the barrier still be necessary replace the fabric promptly. Remove sediment deposits after each storm event as directed by the ENGINEER. As a minimum, remove sediment when deposits reach approximately one-half the height of the barrier. Dispose of sediment deposits off-site, placed upland in a manner which will prevent its later erosion into the resource area, or in a

manner approved by the ENGINEER. Maintain the fabric silt fence until all upslope soils are permanently stabilized by vegetation then remove the silt fence.

3.07 SEDIMENTATION BASINS INSTALLATION AND MAINTENANCE

- A. It shall be the CONTRACTOR's responsibility to ensure that basins are adequately sized to prevent overtopping and to provide the required filtering.
- B. The outlet area from all sedimentation basins shall be constructed so as to minimize erosion of the area surrounding the basin.
- C. Where possible and appropriate, discharge water shall be piped directly to a water course following siltation control.
- D. The sedimentation basins shall be maintained as follows: Inspect at least twice daily during dewatering operations. Provide any required repairs immediately. Clogged sections should be cleaned daily. Remove sediment when deposits reach no more than 6-inches below the top of the hay bales. Dispose of sediment deposits off-site or in a manner approved by the ENGINEER.

3.08 CONTROL OF ACCESS TO SITE

- A. In order to prevent unauthorized access by automobiles, motorcycles, or other vehicles to the construction easement during the course of the work, the CONTRACTOR shall place barriers where the construction easement intersects a public or private roadway. Following completion of the work, the barriers shall be removed.

END OF SECTION

SECTION 02498

RESTORATION OF DISTURBED AREAS

PART I GENERAL

1.01 EXTENT OF WORK

A. The work includes the furnishing of all plant, labor, equipment, and materials, and performing all operations in connection with restoration to preconstruction conditions of all areas affected by work under this Contract, complete, in accordance with the Drawings and Specifications.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. The following Sections of this Specification describe materials and/or work which are relevant to restoration of disturbed areas, but which are not covered by this Section.

1.	Section 02224	TRENCHING
2.	Section 02276	GENERAL ENVIRONMENTAL CONTROLS
4.	Section 02925	LOAMING AND SEEDING

PART 2 PRODUCTS

NOT USED.

PART 3 EXECUTION

3.01 GENERAL

A. Remove and reset or replace all fencing, guardrails, trees, shrubs, lawns, posts, curbing, signs, utilities, and other items which interfere with the progress of the work. Shore or guy any utility pole as required by the utility company.

B. CONTRACTOR shall plan and notify property OWNERS for any work which will affect their properties and indicate what will be done to restore the area after construction is completed.

C. CONTRACTOR shall notify all utility companies and local, state, and federal authorities which will be affected by his work.

D. Wherever streets, lawns, sidewalks, driveways, or other finished surfaces at grade within or outside the contract limit lines have been excavated in fulfilling the work required under this Contract, the CONTRACTOR shall furnish and install all materials necessary to bring finished surfaces level with the existing adjacent surfaces and match existing surface materials.

E. If, during the progress of the Contract work, any water pipe, sewer, conduit, drains, cables, wires, or other utility is damaged as a result of operations under this Contract, the CONTRACTOR shall see that the facility is restored to its original condition at no additional cost to the OWNER.

3.02 TRENCHES NOT IN PAVED AREAS

A. Where the trench occurs adjacent to paved streets in shoulders, sidewalks, or in cross-country areas, the CONTRACTOR shall thoroughly consolidate the backfill and shall maintain the surface as the work progresses. If settlement takes place, he shall immediately deposit additional fill to restore the disturbed area to the same level as the adjacent ground.

END OF SECTION

SECTION 02525

PAVEMENTS, WALKS, AND CURBING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. The work to be done under this Section consists of furnishing all materials, labor, tools and equipment, and performing all operations necessary to complete repair and replacement of pavements, walks, and curbing removed for manhole rehabilitation, as required by existing site conditions or as directed by the Engineer and as specified herein.
- B. Pavements, walks, and curbing shall include all base pavement courses above the subgrade prepared under Section 02200 - EARTHWORK.
- C. All paving shall include permanent replacement of pavement removed for manhole excavation, including base course.
- D. Where required, scarifying existing roadways and placing bituminous concrete pavement shall include removal of excess material and placing, shaping, and compacting gravel borrow.

1.02 WORK NOT INCLUDED

- A. Excavation is specified under Section 02224 - TRENCHING.

1.03 STANDARDS

- A. The Commonwealth of Massachusetts Department of Public Works "Standard Specifications for Highways and Bridges", hereinafter referred to as "the Massachusetts Standard Specifications", forms a part of these Specifications to the extent of the references thereto.

PART 2 PRODUCTS

2.01 GRAVEL FOR BASE COURSE

- A. Gravel for base course for all pavements and walks shall conform to the requirements for gravel borrow in Section 02224 - TRENCHING. If approved, existing gravel in roadway may be used.

2.02 BITUMINOUS CONCRETE PAVEMENT

- A. Bituminous concrete pavement shall conform to Subsection M3.11.00 of the Massachusetts Standard Specifications.
- B. For roadways, driveways, and parking areas: Binder course and top course.
- C. For walks: Binder course and top course.
- D. For curbing: To match existing curbing.

2.03 PORTLAND CEMENT CONCRETE

- A. The cement shall be air-entrained 3500 psi and an approved brand of American-manufactured Portland Cement, Type II, conforming to the applicable requirements of ASTM C150.

PART 3 EXECUTION

3.01 GENERAL

- A. Prior to excavating, the existing pavement shall be sawcut. Refer to Section 01025 – MEASUREMENT AND PAYMENT for payment limits.

3.02 GRAVEL BASE COURSE

- A. Gravel base course for pavements and walks shall be placed and compacted on approved subgrade to a depth of 12 inches for roadways, 12 inches for driveways and 9 inches for walks. The gravel base shall be compacted to at least 98 percent of maximum density for roadways and driveways and 95 percent of maximum density for sidewalks as determined by the Standard AASHTO Test T 180 Method A. The gravel shall be spread and rolled in layers not exceeding 6 inches in compacted thickness. The surface of the 12-inch gravel base shall be shaped to the cross-section of the road. Gravel base courses shall be placed only after the subbase has been compacted.

3.03 BITUMINOUS CONCRETE PAVEMENT

- A. Bituminous concrete pavement for roadways, driveways, and parking areas shall be constructed in accordance with Sections 460 and/or 470 of the latest edition of "Mass Highway – Standard Specifications for Highways and Bridges," for Class I Bituminous Concrete Pavement, Type I-1.

3.04 PERMANENT PAVEMENT REPAIRS

- A. All irregular and broken edges shall be squared up by means of power-driven tools to provide a clean edge. The edges shall be painted with bituminous material.
- B. Before placing bituminous concrete, all castings shall be adjusted to grade.
- C. The permanent trench patch shall consist of two courses of machine-laid bituminous concrete: 2 inches (after compaction) of binder course and 1 1/2 inches (after compaction) of top course.

3.05 WALKS AND DRIVEWAYS

- A. Bituminous Concrete Walks and Driveways. Bituminous concrete walks and driveways shall be constructed in accordance with Subsection 701.62 of the Massachusetts Standard Specifications, except that the number and thicknesses of all courses shall be as follows:
 1. Walks shall have a 1 1/2-inch binder course and a 1-inch top course, and a pitch of 3/16-inch per foot.
 2. Driveways shall have a 2-inch binder course and a 1-inch top course.
- B. Portland Cement Concrete Walks and Driveways. Portland cement concrete walks and driveways shall be constructed in accordance with Subsection 701.61 of the Massachusetts Standard Specifications, except that the thicknesses of all courses shall match existing construction.

3.06 CURBING

- A. Bituminous Concrete Curbing. Bituminous concrete curbing shall be constructed to replace any bituminous curbing removed or damaged by construction. The curbing shall be constructed to the required line and grade. Curbing shall be the same dimensions and material composition as the original curbing. Curbing shall be formed in place, joints between existing and new curbing shall be cut square and the ends painted with bituminous material to improve bond between old and new

curbing. Curbing shall be carefully backfilled and tamped to meet the original grade.

- B. Granite Curbing. Granite curbing removed and reset shall conform to Subsection 501 and 580 of the Massachusetts Standard Specifications.
- C. Construction shall be in accordance with Subsections 501.60, 501.61, 501.62 and 501.64 of the Massachusetts Standard Specifications.

END OF SECTION

SECTION 02670

HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. This section covers the work necessary to furnish and install, complete the high density polyethylene pipe and fittings for low pressure sewer. Includes all fusions for pipe, low pressure sewer services, sewer force main, etc. and testing.

1.02 GENERAL

- A. Like items of material provided hereunder shall be the end products of one manufacturer.
- B. All pipe sizes shown on the Drawings and specified here are "ductile iron pipe size (DIPS)" unless otherwise indicated.
- C. High density polyethylene pipe is designated as "HDPE" on the Drawings.

1.03 REFERENCE STANDARDS

- A. ASTM D3350 – High Density Polyethylene Pipe and Fittings.
- B. AWWA C600 – Installation of Ductile Iron Water Mains and Their Appurtenances.
- C. AWWA C651 – Disinfecting Water Mains.
- D. AWWA C906 – Polyethylene (PE) Pressure Pipe and Fittings, 4" (100mm) through 63" (1,575mm) for Water Distribution and Transmission.
- E. ANSI/AWWA C901 Polyethylene (PE) Pressure Pipe and Tubing, $\frac{1}{2}$ In. (13 mm) Through 3 In. or ASTM F714

1.04 SUBMITTALS

- A. A statement, in writing, from the pipe manufacturer that it is listed with the Plastic Pipe Institute as a qualified extruder for the polyethylene resin being used to manufacturer the pipe for this project.
- B. Catalog information and manufacturer's data sheets confirming that the pipe and fittings conform to the requirements of PART 2 PRODUCTS of this Specification.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Transportation: Care shall be taken during transportation of the pipe that it is not cut, abraded, scraped, kinked, or otherwise damaged.
- B. Storage: Pipes shall be stored on level ground, with a turf or sand surface, free of sharp objects which could damage the pipe. Stacking of the polyethylene pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes under anticipated temperature conditions as recommended by the pipe manufacturer. Where necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such widths as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.

C. Handling Pipe: the handling of the joined pipeline shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. Ropes, fabric, or rubber-protected slings and straps shall be used when handling pipes. Chains, cables, or hooks inserted into the pipe ends shall not be used. Two slings spread apart shall be used for lifting each length of pipe. Pipe or fittings shall not be dropped onto rocky or unprepared ground. Slings for handling the pipeline shall not be positioned at butt-fused joints. Sections of pipes with cuts and gouges exceeding 10 percent of the pipe wall thickness or kinked sections shall be removed and the ends of the pipe rejoined.

1.06 IDENTIFICATION

A. Each pipe length and fitting shall be clearly marked with:

1. Manufacturer's name and trademark
2. Nominal pipe size
3. Material designation

1.07 MANUFACTURERS

A. Acceptable manufacturers include Performance Pipe, (Chevron Phillips Co.), Driscopipe, Isco or approved equal.

1. Driscoplex DR11 4000 would be the approved PE 3408 manufactured by Performance Pipe, J-M Manufacturing Company, Inc.
2. Tubing shall be Drisco Pipe, Hydro-Flo or approved equal.

PART 2 PRODUCTS

2.01 PIPE

A. The pipe shall be extruded from a polyethylene compound and shall conform to the following requirements.

1. The polyethylene resin shall meet or exceed the requirements of ASTM D3350 for PE 3408 material with a cell classification of 345464C.
2. The polyethylene compound shall be suitably protected against degradation by ultraviolet light by means of carbon black, well dispersed by precompounding in a concentration of not less than 2 percent.
3. Pipe shall be black with three pairs of equally spaced longitudinal blue stripes co-extruded on to pipe outside surface.
4. The pipe manufacturer shall be listed with the Plastic Pipe Institute as meeting the recipe and mixing requirements of the resin manufacturer for the resin used to manufacturer the pipe for this project.
5. The pipe shall be designed in accordance with the relationship of the AWWA formula:

$$PC = \frac{2 \times HDB \times DF}{(DR-1)}$$

where, PC = Pressure Class (psi)

HDB = hydrostatic design basis for PE 3408 (psi)

DF = design factor (0.5 for clean water)

6. The HDPE pipe shall be homogenous throughout and free of visible cracks, holes, foreign inclusions, or other injurious defects. All HDPE pipes shall have a standard dimensional

ration (SDR) of 11.

7. Pipe lengths, fittings, and flanged connections to be joined by thermal butt-fusion shall be of the same type, grade, and class of polyethylene compound and supplied from the same raw material supplier.

8. Pipe shall have the following minimum physical properties:

Property	Specification	Unit	Nominal Value
Material Designation	PPI/ASTM		PE 3408
Cell Classification	ASTM D-3350		345646C
Density	ASTM D-1505	gm/cm ³	0.955
Melt Index	ASTM D-1238	gm/10 min.	0.10
Flex Modulus	ASTM D-790	psi	>130,000
Tensile Strength	ASTM D-638	psi	3,200
HDB @ 73NF	ASTM D-2837	psi	1,600
U-V Stabilizer	ASTM D-1603	% C (Carbon Black)	Min. 2
Hardness	ASTM D-2240	Shore "D"	65
Compressive Strength (yield)	ASTM D-695	psi	1,600
Tensile Strength @ Yield (Type VI Spec.)	ASTM D-638 (2"/min.)	psi	3,200
Elongation @ Yield	ASTM D-638	%, minimum	8
Tensile Strength @ Break (Type VI Spec.)	ASTM D-638	psi	5,000
Elongation @ Break	ASTM D-638	%, minimum	750
Modulus of Elasticity	ASTM D-638	psi	130,000
Linear Thermal Expansion Coefficient	ASTM D-696	in./in./NF	9 X 10 ⁻⁵
Brittleness Temperature	ASTM D-746	NF	<-180
Vicat Softening Temperature	ASTM D-1525	NF	257

2.02 FITTINGS

A. Polyethylene fittings shall be molded for sizes 8-inch and smaller, conforming to ASTM D3261, and shall be fabricated from polyethylene pipe for sizes 10-inch and larger, conforming to AWWA C906, by means of thermal butt-fusion. The ends of the fabricated fittings shall not be trimmed to match the pipe section to which they are going to be joined. All polyethylene fittings shall have the same or higher pressure rating as the pipe when installed in accordance with the latest technical specifications.

B. MJ Adapters

1. MJ Adapters 4" thru 16" may be provided with optional Stainless Steel Stiffener. MJ Adapters 14" and above shall be provided with Heavy Duty Back-up Ring Kits. All MJ adapters 18" and above must be provided with Stainless Steel stiffeners. Meet AWWA C906, ASTM D3350, ASTM D3261, ASTM D2513 standards.
2. Install as DIPS sizing.

C. Electrofusion Coupling:

1. Pressure rated to 200 psi
2. Meet AWWA C906 and ASTM D3350 standards
3. Complies with ASTM F1055 standards

4. DIPS sizing.
5. Coupling manufactured with a solid pin connection and is supplied with a 24-digit ISO recognized barcode label which facilitates the electrofusion.
6. Must meet tensile strength test pipe elongation in excess of 25% without separating from electrofusion coupling.
7. Must meet joint integrity test – crush test pipe without separation from electrofusion coupling.

D. Electrofusion Branch Saddle

1. Pressure rated to 200 psi.
2. Meet AWWA C906 and ASTM 3350 standards.
3. Meet ASTM F1055 standards.
4. Outlet to meet ASTM D3261.
5. Coupling manufactured with a solid pin connection and is supplied with a 24-digit ISO recognized barcode label which facilitates the electrofusion.
6. Must meet tensile strength test pipe elongation in excess of 25% without separating from electrofusion coupling.

E. Electrofusion Corporation Saddle

1. Pressure rated to 200 psi.
2. Meet AWWA C906 and ASTM 3350 standards.
3. Meet ASTM F1055 standards.
4. Compression Ring SS 304, Adapter Insert Brass 360 Alloy, and stainless steel ANSI threads.
5. Coupling manufactured with a solid pin connection and is supplied with a 24-digit ISO recognized barcode label which facilitates the electrofusion.
6. Must meet tensile strength test pipe elongation in excess of 25% without separating from electrofusion coupling.
7. Must meet joint integrity test – crush test pipe without separation from electrofusion coupling.

2.03 JOINTS

- A. Joints shall be thermal butt-fusion, except where connecting to unions, valves and other fittings with mechanical (flanged or MJ adapter) connections. No mechanical couplings shall be used unless shown on the Drawings.
- B. Hydrant branches can be accomplished with tees, sidewall fusion or electrofusion at the Contractor's option. Details shall be part of the submittal package. The branch will terminate in a mechanical joint adapter transitioning to a ductile iron hydrant.
- C. Service connections can be either electrofusion corporation saddles or sidewall fusion tapping tees connected to a polyethylene service tubing (new services). Existing services

will transition to copper tubing.

D. See drawings for locations where DI mechanical joints and fittings are installed in lieu of HDPE and electrofusions.

2.04 POLYETHYLENE TUBING

Tubing for buried low pressure sewer services and shall be polyethylene American made of high-density polyethylene designed for 200 psi minimum service. Tubing shall conform to AWWA C-901 latest revisions. The tubing shall be copper O.D. size and be suitable for use with standard industry brass compression fittings without special adapters. Insert stiffeners shall be provided for use with all compression joint connections.

2.05 DETECTABLE UNDERGROUND WARNING TAPE

1. Detectable Underground Warning Tape shall be 5 mil tape with aluminum backing for locating with non-ferrous locator
2. Tape shall be 3" in width and be marked with the term "Caution Buried Water Line Below".
3. Tape shall be installed in backfill 2 feet above all HDPE pipes and tubing.

PART 3 EXECUTION

3.01 GENERAL

A. All polyethylene pipe shall be cut, fabricated, and installed in strict conformance with pipe manufacturer's recommendations. Joining, laying, and pulling of polyethylene pipe shall be accomplished by personnel experienced in working with polyethylene pipe. The pipe supplier shall certify, in writing, that the Contractor is qualified to join, lay and pull the pipe or representative of the pipe manufacturer shall be onsite to oversee the pipe joining. Expenses for the representative shall be paid for by the Contractor.

3.02 PIPE PREPARATION

A. Inspect all pipe and fittings before lowering into the prepared trench to ensure that no cracked, broken, or defective materials are being used in the work and that the pipe is free from all debris. Clean the ends of the pipe thoroughly with a brush or appropriate means. Remove foreign matter and dirt from the inside of the pipe and keep clean during and after laying. Ensure that the inside surfaces are smooth and free from any projections that would interfere with the assembly of the joint or impeded flow.

3.03 PIPE PLACEMENT

A. Care shall be exercised when installing the pipe in the ground or above grade onto pipe supports to prevent damage or twisting of the pipe.

3.04 JOINING PIPE SECTIONS

A. Pipes shall be joined to one another, to the polyethylene fittings, and to the flange connections by means of thermal butt-fusion. Polyethylene pipe lengths, fittings, and flanged connections to be joined by thermal butt-fusion shall be of the same type, grade, and class of polyethylene compound and supplied from the same raw material supplier.

B. Connections of the polyethylene pipe to auxiliary equipment such as valves, pumps, tanks, and other piping systems shall be through flanged or mechanical joint connections.

C. Butt Fusion Joining:

1. The polyethylene pipe shall be joined by the method of thermal butt fusion, as outlined in ASTM D2657, Heat Joining Polyolefin Pipe and Fittings. Butt fusion joining of pipe and fittings shall be performed in accordance with the procedures recommended by the manufacturer. The temperature of the heater plate should not exceed 425°F ±25°F. The joining interfacial pressure should not exceed 25 pounds per square inch of projected end area for European design fusion machines or 75 pounds per square inch of projected end area for American design fusion machines.
2. Butt fusion equipment used in the joining procedures shall be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, temperature requirements, alignment, and fusion pressures. The Contractor shall utilize a qualified distributor to provide training to personnel who will be performing butt fusion jointing prior to assembling pipe.
3. The pipe supplier shall be consulted to obtain machinery and expertise for the joining by butt fusion of polyethylene pipe and fittings. No pipe or fittings shall be joined by fusion by any contractor unless he is adequately trained and qualified in the techniques involved.
4. Fusion Quality. The Contractor shall ensure the field set-up and operation of the fusion equipment, and the fusion procedure used by the Contractor's fusion operator while on site. Upon request by the Owner or Engineer, the Contractor shall verify field fusion quality by making and testing a trial fusion. The trial fusion shall be allowed to cool completely; then test straps shall be cut out and bent strap tested in accordance with ASTM D2657. If the bent strap test of the trial fusion fails at the joint, the field fusion represented by the trial fusion shall be rejected. The Contractor at his expense shall make all necessary corrections to equipment, set-up, operation and fusion procedure, and shall re-make the rejected fusions.

D. Electrofusion Joining

1. The polyethylene pipe shall be joined at corporations, branches, adapters and couplings by electrofusion. The fittings shall meet the requirements of ASTM F1055 (Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing).
2. Electrofusion equipment shall be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, temperature requirements and alignment. The Contractor shall utilize a manufacturer's factory trained technician to provide training to personnel who will be performing the electrofusion to the water main.
3. The pipe supplier shall be consulted to obtain machinery and expertise for the electrofusion of the coupling, branches, adapters and corporations.
4. The Contractor shall ensure the field set-up and operation of the fusion equipment, and the fusion procedure used by the Contractor's fusion operator while on-site. The Owner or Engineer can request the Contractor to field verify the quality of the electrofusion. If the fusion fails, the Contractor, at his own expense, shall make all necessary corrections to equipment, set-up, operation and electrofusion procedures, and shall re-make the rejected electrofusions.
5. Contractor to inspect all electric coils prior to commencing an electrofusion.
6. If electrofusion fails due to Contractor installation (water entering fuse), the Contractor will replace the electrofusion at his expense.

- E. Transportation: Damaged pipe shall be removed from the job site as directed by the Engineer and shall be replaced at the Contractor's sole expense.
- F. Each pipe and fitting shall be carefully inspected before the exposed pipe or fitting is installed or the buried pipe or fitting is lowered into the trench. Clean ends of pipe thoroughly. Remove foreign matter and dirt from inside of pipe and keep clean during and after laying.
- G. Installation of Exposed Piping:
 - 1. Unless shown otherwise, piping shall be parallel to structure lines.
 - 2. Lateral supports for seismic loads shall be provided at all changes in direction.
 - 3. Piping shall be installed without springing or forcing the pipe in a manner that would set up stresses in the pipe, valves, or connected equipment.
- H. Interim Cleaning: Care shall be exercised during fabrication to prevent the accumulation of pipe cuttings and filings, gravel, cleaning rags, etc., within the piping sections. All piping shall be examined to assure removal of these and other foreign objects prior to assembly. Shop cleaning may employ any conventional commercial cleaning method if it does not deform, swell, or otherwise alter the physical properties of the material being cleaned.

3.05 TESTING

- A. General: The Contractor shall test all installed pipe in accordance with the requirements of AWWA C600 and the manufacturer's recommended testing procedures for polyethylene pipe, except as amended or added below:
 - 1. The Contractor shall furnish all labor, materials and equipment necessary for any and all required pipe taps for testing, and as necessary for testing as specified.
 - 2. A pressure test and leakage test are required for all pipe.
 - 3. Water to be furnished by the Owner.
 - 4. Leak testing required all piping and components in test section to be restrained.
 - 5. Air testing is not acceptable.
 - 6. HDPE pipe stretches, and testing needs to accommodate this pipe characteristic.
- B. Testing requirements:
 - 1. Test duration: 2 hours. Under no circumstances shall the total time under test exceed 8 hours at 1.5 times the system pressure rating. If the test is not complete within this time limit (due to leakage, equipment failure, etc.), the test section shall be permitted to "relax" for 8 hours prior to the next test sequence.
 - 2. Test pressure: 150% of maximum operating pressure as determined by the Engineer or the rated pressure of the pipe whichever is greater.
 - a. Test pressures must be reduced when the test section is at elevated temperature either from service conditions or from environmental conditions such as being warmed by the sun. Multiply the test pressure by the multiplier to determine the allowable elevated temperature test pressure.

Elevated Temperature Multiplier

Test Section Temperature °F (°C)	≤80 (≤27) †	≤90 (≤32)	≤100 (≤38)	≤110 (≤43)	≤120 (≤49)	≤130 (≤54)	≤140 (≤60) ‡
Multiplier	1.00	0.90	0.80	0.75	0.65	0.60	0.50

† Use the 80°F (27°C) multiplier for 80°F (27°C) and lower temperatures. ‡ The maximum service temperature for Performance Pipe PE pressure piping is 140°F (60°C).

3. Allowable pressure loss: Pressure shall not vary more than ± 5 psi for the duration of the pressure test.
4. Make-up Water Allowance for hydrostatic leak testing. The amount of make-up water needed to maintain test pressure must be less than allowances shown below.

Make-up Water Allowance for Test Phase – Alternate 2, (U.S. Gal.100 ft of pipe)			
Nominal Pipe Size (in.)	1-Hour Test	2-Hour Test	3-Hour Test
1-1/4	0.06	0.10	0.16
1-1/2	0.07	0.10	0.17
2	0.07	0.11	0.19
3	0.10	0.15	0.25
4	0.13	0.25	0.40
5-3/8	0.19	0.38	0.58
5	0.21	0.41	0.62
6	0.3	0.6	0.9
7-1/8	0.4	0.7	1.0
8	0.5	1.0	1.5
10	0.8	1.3	2.1
12	1.1	2.3	3.4
13-3/8	1.2	2.5	3.7
14	1.4	2.8	4.2
16	1.7	3.3	5.0
18	2.0	4.3	6.5
20	2.8	5.5	8.0
22	3.5	7.0	10.5
24	4.5	8.9	13.3
26	5.0	10.0	15.0
28	5.5	11.1	16.8
30	6.3	12.7	19.2
32	7.0	14.3	21.5
34	8.0	16.2	24.3
36	9.0	18.0	27.0
42	12.0	23.1	35.3
48	15.0	27.0	43.0
54	22.0	31.4	51.7

C. Pressure testing outside the trench:

1. If specified by the engineer, pressure testing may be conducted prior to pipe installation.
2. After the pipe has been joined, fill it with water, carefully bleed off any trapped air. Subject the pipe to a hydrostatic test pressure that is 1.5 times the system design pressure for a maximum of 3 hours. During this time, add water periodically to maintain the test pressure; this compensates for the initial stretching of the pipe. The line pressure tightness is determined by visual observation; therefore, it is not necessary to measure the make-up water. Examine every fused joint; any leakage must be repaired and then retested.
3. It shall be the responsibility of the contractor to ensure that appropriate safety precautions are observed during hydrostatic testing above ground.

D. Pressure testing in the trench:

1. Fill the pipeline with water after it has been laid; bleed off any trapped air. Subject the

lowest element in the system to a test pressure that is 1.5 times the design pressure, and check for any leakage. When, in the opinion of the engineer, local conditions require that the trenches be backfilled immediately after the pipe has been laid, apply the pressure test after backfilling has been completed but not sooner than a time which will allow sufficient curing of any concrete that may have been used. Typical minimum concrete curing times are 36 hours for early strengths and 7 days for normal strengths.

2. The test procedures consist of two steps; the initial expansion and the test phase. When test pressure is applied to a water filled pipe, the HDPE pipe expands. During the initial expansion of the pipe under test, sufficient make-up water must be added to the system at hourly intervals for 3 hours to maintain the test pressure. After about 4 hours, initial expansion should be complete and the actual test can start.
3. When the test is to begin, the pipe is full of water and is subjected to a constant test pressure of 1.5 times the system design pressure. The test phase should not exceed 3 hours, after which time any water deficiency must be replaced and measured. Add and measure the amount of make-up water required to return to the test pressure and compare this to the maximum allowance in the table above.
4. An alternate leakage test consists of maintaining the test pressure (described above) over a period of 4 hours and then dropping the pressure by 10 psi (0.69 MPa). If the pressure then remains within 5% of the target value for 1 hour, this indicates there is no leakage in the system.
5. Above procedure taken from PPI Technical Report TR-31 by the Plastic Pipe Institute.

END OF SECTION

SECTION 02755

EXISTING SEWER MANHOLE MODIFICATIONS AND FRAME AND COVER REPLACEMENT

PART 1 GENERAL

1.01 SCOPE

- A. The work of this section includes furnishing all labor, materials, tools, and equipment required to modify manholes for connections and to install new sewer manholes as specified, including brick, rebuilding of bench, mortar, alignment to grade and all other incidental work required to provide for a complete manhole connection or new manhole installation with all disruption to surrounding surfaces repaired in kind.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02510 HOT MIX ASPHALT PAVING

1.03 DESIGN CRITERIA

- A. The work covered by this specification shall be in accordance with the best practice of the industry. The specifications call attention to certain features but do purport to cover all details entering into the required work.

1.04 PRODUCT HANDLING

- A. All materials and equipment shall be shipped, stored, handled and installed in such a manner as not to degrade the environment nor the quality, serviceability or appearance of any materials and equipment which may surround them.

1.05 PAYMENT

- A. Payment for the work described in this section shall be made in accordance with the provisions of Section 01025, Measurement and Payment.

PART 2: MATERIALS

2.01 SUBMITTALS

- A. Brochures shall be submitted for all items to be furnished in accordance with the provisions of the General Conditions as supplemented and Section 01300 Submittals. Submittals shall include information of the manhole frames and covers, grout, mortar, bricks, and related materials intended to be utilized under the scope of this item.
- B. Submittals shall include manufacturer's certifications of compliance with reference standards and manufacturer's recommendations.

2.02 REFERENCE STANDARDS

- A. ASTM (American Society for Testing and Materials)
 1. ASTM A48-76, Spec. for Gray Iron Casting.
 2. ASTM C32-73 (1979), Spec. for Sewer and Manhole Brick (Made from Clay or Shale). Grade SS.

3. ASTM C150-81, Spec. for Portland Cement.
4. ASTM C207-79, Spec. for Hydrated lime for Masonry Purposes.
5. ASTM C478-80, Spec. Precast Reinforced Concrete Manhole Sections.
6. ASTM C923-79, Spec. for Resilient Connectors Between Reinforced Concrete Manhole Structures and pipes.

2.03 FRAMES AND COVERS

- A. Cast Iron manhole frames and covers shall conform to: ASTM A48-76 Spec. for Gray Iron Casting.
- B. Standard manhole frames and covers with a clear opening as shown on contract drawings shall be a Lebaron model or equal having a weight of not less than 410 lbs.
- D. Cover to frame shall have machined contact surfaces to prevent rocking.
- E. Word "SEWER" cast in the cover.

2.04 MANHOLE STEPS

- A. Manhole steps shall be copolymer polypropylene plastic with 2" grade 60 steel reinforcement cast in place or installed utilizing inserts if approved by the ENGINEER. All steps shall be twelve inches on center with abrasive step surface and safety side edge, fourteen inches clear step, one inch wide and fifteen and seven sixteenths inches wide. Steps shall be model PS2-PFSL manhole step as manufactured by MA Industries Inc. or equal.

2.05 PRECAST CONCRETE MANHOLE SECTIONS

- A. Precast Concrete Sections: shall conform to ASTM C478-80 with the following modifications:
 1. Wall thickness as indicated.
 2. Cement: ASTM C150-81, Type II.
 3. Joints between sections: Butyl rubber-based sealants per Type B AASHTO M198-75.
 4. Steps set accurately as indicated and specified.
 5. Cones and Conical Transitions similar in design and construction to riser sections and as indicated.
 6. Cast and build into bases during manufacture:
 - a. Resilient connectors for pipe connections.
 - b. Holes shall accept flexible rubber sleeve (such as Kor-N-Seal Boot)
 7. Cure by subjecting to saturated steam at temperature between 100 and 130 degrees F. for 12 hours or more.

8. Cast or drill only two lift holes in each section.
9. Mark clearly date of manufacture and name or trademark of manufacturer on insides of wall, on all sections.
10. Acceptance on basis of material tests and product inspection.

2.06 MANHOLE BRICK AND DONUT SECTION

- A. Manhole brick shall conform to ASTM C32-73 (1979), Spec. for Sewer and Manhole Brick (Made from clay and shale), Grade SS. Donut section (adjusting collars) shall be 4000-psi concrete fiber reinforced as manufactured by Superior Concrete or equal.

2.07 PIPE CONNECTIONS TO MANHOLES

- A. Joints where pipes and manholes meet shall conform to the following:
 1. Flexible rubber sleeves (boots) as provided by Interpace Corporation - Concrete Systems Inc., Hudson, NH, in their precast sanitary manholes or an approved equal or as specified below.
 2. Resilient connectors for pipes to precast sections per ASTM C923079, and conforming to manufacturer's standards. Connectors using castings and bolts with non-resilient bearing, NOT ACCEPTABLE.
 3. Rubber ring water stops for use in pipe-to-manhole joints where indicated. Rings of resilient material that will fit snugly over pipes, held firmly against pipe surface by means of a mechanical take-up device which when tightened will compress resilient material or by a stretch fit. Water stop designed and installed so that leakage between pipe and manhole is minimized. Materials and manufacturer of water stops conform to applicable provisions of the ASTM Standard Specifications for Resilient Connectors between Concrete Manhole Structures and Pipes, Designation C923-79.
 4. Non-shrink Grout:
 - a. Masterflow 713 Grout made by Master Builders, Cleveland, Ohio.
 - b. Five Starr Grout made by U.S. Grout Corps., Old Greenwich, Conn.
 - c. Upcon made by Upon Co., Cleveland, Ohio.
 - d. Vandex Plug as made by Vandex Inc., Columbia, Maryland.

2.08 CEMENTIOUS MIXES FOR WORK ON MANHOLES

- A. For Brickwork: Mix Portland cement, hydrated lime and sand in proportion by volume of 1: 2: 42.
- B. For Plugging lift holes: Mix Portland cement and sand in proportion by volume of 1: 12, or use hydraulic cement (Octoplug by IPA Systems or equal).
- C. Use only sufficient water to form workable mixture. Mortar for plugging damp just short of "balling".

PART 3 EXECUTION

- A. Masonry work shall be placed permitting the new frame to be set in a full bed of mortar with the top of the frame conforming to the existing finished ground or pavement surface. Masonry work shall be done in a workman like manner so as to provide a solid base for the new manhole frame. The masonry work shall maintain the clear opening provided by the frame for access to the manhole.
- B. The frame on the exterior shall be cement grouted over the flange, and a plaster coat of cement grout shall be applied over the masonry work.
- C. In paved areas, a concrete collar shall also be placed down around the masonry work and up to within 33 inches of the manhole frame. The concrete collar shall have a minimum width of 12 inches beyond the masonry, and minimum depth of 12 inches, and in contact with the top manhole section as shown on the details or as directed by the ENGINEER. Finish mortar smoothly and give a slight slope to shed water away from frame.
- D. In paved areas, a clean sawcut of the existing pavement shall be made and Class I, Type I-1, hot mix asphalt pavement shall be placed in accordance with Massachusetts Highway Department Standards, over the concrete collar. Trench preparation and pavement restoration shall be performed in accordance with Section 02510.
- E. In unpaved areas anchor bolts shall be used to secure the new frame. Anchor bolts shall be 1/2" stainless steel threaded rod with a minimum of 4" embedment length. Embedment shall be standard stainless steel expanding bolt with cavity filled with ceramic epoxy to provide additional holding capacity. Four to six anchors with one between each flange anchor bolts shall be equally spaced in frame flange. The brick corbel shall be removed and replaced with manhole donut through which the anchor bolts will pass into the manhole cone section. One bolt shall be located between each web-flange. The Contractor shall drill the existing manhole, donut and collar sections, and frame web to accept a bolt between each flange web. A collar butyl rubber-based sealant Type B AASHTO M198-75 (two 1/2-inch diameter strips on outside and inside of donut between which holes will be drilled for the anchor bolts) will be used between each donut/collar section, the manhole frame, and manhole cone. Excess butyl rubber sealant shall be removed after compression. A grout fill shall be placed on the exterior covering the side of the frame down to the cone section of the manhole.

- F. In unpaved areas, replace existing soil material removed. If topsoil is lost during excavation or mixed with subsoil, Contractor will provide new topsoil (6 inches min.) and local grass seed mixture. Dispose any excess material or provide any additional materials required.
- G. Remove all debris from area. Rake smooth in un-paved areas. Sweep clean in paved areas.

END OF SECTION

SECTION 02730

SANITARY SEWERS & FORCE MAINS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Furnishing pipe for collecting and transporting sewage.
- B. Furnishing miscellaneous appurtenances.
- C. Installing and/or removing and replacing sanitary sewers as shown on the Drawings.
- D. Removing existing sewer service connection and installing new gravity and low-pressure sewer service connection as shown on the Drawings.
- E. Installation.
- F. Testing.

1.02 REFERENCE STANDARDS

- A. ANSI A21.4/AWWA C104 - Cement-Mortar Lining for Ductile-Iron and Gray-Iron Pipe and Fittings for Water.
- B. ANSI A21.10/AWWA C110 - Gray-Iron and Ductile-Iron Fittings, 3 Inch Through 48 Inch, for Water and Other Liquids.
- C. ANSI A21.11/AWWA C111 - Rubber-Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
- D. ANSI A21.51/AWWA C151 - Ductile Iron Pipe, Centrifugally Cast in Metal Molds and Sand Lined Molds for Water and Other Liquids.
- E. ASTM D3034 - Type PSM Poly (Vinyl Chloride)(PVC) Sewer Pipe and Fittings.
- F. ASTM D3212 - Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.
- G. UNI-B-6 - Low Pressure Air Testing Of Installed Sewer Pipe.

1.03 SUBMITTALS

- A. Submit shop drawings and product data in accordance with Section 01340.
- B. Submit manufacturer's recommendations for pipe jointing and laying.
- C. No later than two weeks prior to commencing operations, submit to the ENGINEER for approval a detailed plan of operations. Include equipment to be used, qualification of personnel, traffic control, maintenance of flow and methods of protecting existing utilities.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Pipe shall be unloaded and inspected in accordance with the manufacturer's instructions.

- B. Pipe and fittings stored on the site shall be stored in the protective unit packages provided by the manufacturer. If packages need to be opened, the pipe shall be stored on a flat surface and not in direct contact with the ground. Do not stack higher than four feet. Keep inside of pipe and fittings free from dirt and debris. Care shall be exercised to avoid compression damage or deformation to the pipe.
- C. All pipe and fittings that are stored shall be covered to provide protection from the sunlight.
- D. Handle all material carefully at all times. Any pipe or fitting having a crack, or which has received a severe blow shall be marked rejected and immediately be removed from the work.

1.05 RELATED SECTIONS

- A. SECTION 11307 SEWAGE GRINDER PUMP STATION

PART 2 PRODUCTS

2.01 GENERAL

- A. All products included in this section shall conform to the requirements of the standard specifications referenced herein.
- B. Pipe size and material shall be as shown on the Drawings.

2.02 TYPE OF PIPE AND JOINTS

- A. The types of pipe and joints to be used for the work are indicated in the following table. All pipes shall be of circular cross-section.

Service	Pipe	Joint Type
Gravity sewers	Polyvinyl Chloride	Bell and Spigot Rubber Gasket
Low Pressure Sewers	HDPE/ PVC	Fusion/ Bell and Spigot Rubber Gasket
Low Pressure Sewers (less than 2 inches diameter)	HDPE/ PVC	Tubing-Fusion/ Solvent weld
Force mains	Polyvinyl Chloride/Ductile Iron	Bell and Spigot Rubber Gasket

- B. Joint type designation is for ease in description only. Joints shall meet the requirements stated in this and other Sections of these Specifications.
- C. Detailed requirements for each type of pipe and joints are specified in subsequent paragraphs.
 - 1. All pipe and fittings furnished shall be accompanied by the manufacturer's certificate of compliance, in addition to meeting the performance tests specified hereinafter.
 - 2. When the Schedule of Prices or the Drawings provide for alternate types of pipes, the Contractor shall select the type of pipe he proposes to use. If no selection is made, the Owner will specify the type of pipe to be used.

2.03 ACCEPTABLE MANUFACTURERS

- A. Specifications: Products specified in this section are based on those manufactured by the following firms:

1. Polyvinyl chloride pipe and fittings - Johns-Manville, Certain Teed.
2. Ductile iron pipe and fittings - Clow Corporation, U.S. Pipe.
3. Flexible or transition couplings for non-pressure sewer pipe - Fernco, Inc., Maxadapter.
4. Flexible or transition couplings for pressure pipe - Dresser.

B. Substitutions: Products of equal quality, detail, function, and performance may be proposed for substitution by following the procedures in Section 01630.

2.04 SANITARY SEWER

A. Polyvinyl Chloride Pipe: Shall be SDR-35, push-on joint conforming with ASTM D3034. Fittings shall comply with ASTM D3034. Joints shall comply with ASTM D3212.

1. Each length of pipe shall have an integral bell and shall be supplied in 12.5 foot lengths.
2. Joint shall be push-on type using elastomeric gasket designed to prevent slipping during jointing. The gaskets shall be factory installed and secured in place prior to delivery to the job site.
3. Six inch diameter wye branch connections shall be supplied for service connections.
4. All pipe, fittings, gasket material and lubricant shall be supplied by the same manufacturer. Petroleum base lubricants shall not be used.
5. Physical and chemical properties of pipe couplings shall be equal to those properties of the pipe.

B. Push-on Ductile Iron Pipe: Shall conform to ANSI A21.51/ AWWA C151 Class 52. Mechanical joint fittings shall be ductile iron conforming to ANSI A21.10/AWWA C110. Pipe and fitting joints shall meet ANSI A21.11/AWWA C111 standards and shall include plain rubber gaskets. Pipe and fittings shall be cement lined and seal coated inside and outside in accordance with ANSI A21.4/AWWA C104.

2.04 FORCE MAIN

A. Polyvinyl Chloride (PVC) Pressure Pipe (Force Main) shall be Class 150 SDR-18 push on joint pressure pipe conforming to AWWA C900. Fittings shall be mechanical joint ductile iron conforming to ANSI A21.53/AWWA C153. Pipe and fitting joint shall meet ANSI A21.11/AWWA C111 standards and shall include plain rubber gaskets suitable for use in sewage. Fittings shall be cement lined and seal coated inside and out in accordance with ANSI A21.4/AWWA C104. Fittings shall be furnished with ductile iron retainer glands and 3/4-inch tie rods as required.

1. Joint shall be push-on type using elastomeric gasket designed to prevent slipping during jointing. The gaskets shall be factory installed and secured in place prior to delivery to the job site.
2. All pipe, fittings, gasket material and lubricant shall be supplied by the same manufacturer. Petroleum base lubricants shall not be used.
3. Physical and chemical properties of pipe couplings shall be equal to those properties of the pipe.

2.05 LOW PRESSURE SEWER SYSTEM MAIN AND SERVICE LATERAL MATERIALS

- A. Low pressure sewer system mains shall be:
 1. PVC pipe manufactured in accordance with ASTM D1785, ASTM D2241, ASTM D2672, or AWWA C900 as follows:
 - Pipes (2) – (4) inches diameter: minimum SDR-21
 - Pipes larger than (4) inch diameter: minimum DR-18
 - Pipes less than (2) inch diameter: SDR-21
 2. HDPE pipe manufactured in accordance with ASTM D2239, D3035, or AWWA C901.
 - HDPE Pipes Iron Pipe Size (IPS) Pressure Pipe PE4710: DR-11 (200 PSI)
- B. All low-pressure sewer pipes shall be marked with diameter, manufacturer's name or trademark, pressure pipe type, grade and class, and shall be clearly visible for inspection.
- C. Low pressure sewer service laterals shall be:
 1. Minimum (1.25) inch for residential, or (2.0) inch for commercial, AWWA C901, SDR-9, polyethylene (PE) CTS, with a minimum pressure rating of (200) psi.
 2. No joints are permitted in the service lateral from the main to the service box. The service box shall be located in non-traffic areas.

2.06 POLYETHYLENE TUBING

- A. Tubing for buried low pressure sewer services and shall be polyethylene American made of high-density polyethylene designed for 200 psi minimum service. Tubing shall conform to AWWA C-901 latest revisions. The tubing shall be copper O.D. size and be suitable for use with standard industry brass compression fittings without special adapters. Insert stiffeners shall be provided for use with all compression joint connections.

2.07 FLEXIBLE COUPLINGS AND TRANSITION COUPLINGS

- A. Flexible or transition couplings for non-pressure sewer pipe shall be resilient plastic with recessed stainless-steel bands at each end for fastening. New non-pressure pipe shall be connected to existing pipe with stainless steel shielded sewer transition couplers. MAXADAPTOR® type adapters are acceptable for this application. Fernco® Strong Back RC 1000 Series Coupling(s) with a .012" stainless steel shield and a molded in bushings are also acceptable for this application. Note that "Fernco® couplings without shields are NOT ACCEPTABLE.

2.06 IDENTIFICATION

- A. Each pipe length and fitting shall be clearly marked with:
 1. Manufacturer's name and trademark.
 2. Nominal pipe size.
 3. Material designation.

2.07 DETECTABLE TRACER TAPE

- A. The tape shall be a minimum of 3-inches wide. The upper face of the tape shall be of a highly visible color easily detectable when exposed by digging. The upper face shall carry the warning of the buried plastic sewer main below. The tape shall have a metallic backing in order that it may be traced by metal or pipe locators.

PART 3 EXECUTION

3.01 GENERAL

- A. Pipe and fittings shall be handled with care to ensure that the pipe and fittings are in sound, undamaged condition. Particular care shall be taken to prevent damage to pipe coating and lining (if any).
- B. The CONTRACTOR shall furnish slings, straps and/or other approved devices to support the pipe when it is lifted. Pipe and fittings shall not be dropped from trucks onto the ground or into the trench. Transporting pipe and fittings from storage areas shall be restricted to operations which will not cause damage to the pipe or lining (if any).
- C. All pipe and fittings shall be examined before laying and no pipe or fittings shall be installed which are found to be defective. Damaged pipe coatings and/or lining (if any), shall be repaired as approved or directed by the ENGINEER.
- D. Any pipe showing a distinct crack with no evidence of incipient fracture beyond the limits of the visible crack, if approved, may have the cracked portion cut off by, and at the expense of, the CONTRACTOR before the pipe is laid so that the pipe used is sound. The cut shall be made in the sound portion of the barrel at least 12 inches from the visible limit of the crack.
- E. If any defective pipe is discovered after it has been laid, the CONTRACTOR shall remove the defective pipe and replace it with sound pipe at no additional cost to the OWNER.
- F. In general, gravity pipe laying shall proceed upgrade with spigot ends pointing in the direction of flow.
- G. Flow from existing service connections and main lines shall be maintained at all times by pumping or other methods approved by the ENGINEER. Under no circumstances will the dumping of raw sewage on private property, in municipal streets or into waterways, be allowed.

3.02 CONTROL OF ALIGNMENT AND GRADE

- A. Easement and property and other control lines necessary for locating the Work as well as elevations and bench marks used in the design of the Work are shown on the Drawings. The CONTRACTOR shall use this information to set line and use a level or transit to set grade.
- B. The CONTRACTOR may use laser equipment to assist in setting the pipe provided he can demonstrate satisfactory skill in its use.
- C. The use of string levels, hand levels, carpenter's levels, or other similar devices for transferring grade or setting pipe are not to be permitted.
- D. During construction provide the ENGINEER, at his request, all reasonable and necessary materials, opportunities, and assistance for setting stakes and making measurements, including the furnishing of one or two rodmen as needed at intermittent times.
- E. CONTRACTOR shall not proceed until he has made timely request of the ENGINEER for, and

has received from him, such controls and instructions as may be necessary as Work progresses. The Work shall be done in strict conformity with such controls and instructions.

F. The CONTRACTOR shall carefully preserve bench marks, reference points and stakes, and in case of willful, careless, or accidental destruction by his own men, he will be responsible for the resulting expense to re-establish such destroyed control data and shall be responsible for any mistakes or delay that may be caused by the loss or disturbance of such control data.

G. Maintain the proper alignment in laying pipe.

3.03 INSTALLING PIPE AND FITTINGS

A. The CONTRACTOR shall have on the job site with each pipe laying crew, all the proper tools to handle and cut the pipe.

B. All pipe and fittings shall be thoroughly cleaned before laying and shall be kept clean until installed.

C. Pipe shall be laid in the dry trench conditions. At no time shall water in the trench be permitted to flow into the pipe. At any time that Work is not in progress, or the trench is unattended, the end of the pipe shall be suitably closed to prevent the entry of animals, earth, water etc. using watertight expandable plugs.

D. Lay pipe and fittings in accordance with the requirements of AWWA C600, except as provided herein. PVC pipe shall not be installed when temperatures are below 32EF unless approved by ENGINEER.

E. Excavation shall conform to Section 02224 - Trenching.

F. As soon as excavation has been completed to the proper depth, place and compact bedding materials, as specified in Section 02224, to the elevation necessary to bring the pipe to grade. The compacted material shall be shaped so that the bottom quadrant of the pipe rests firmly on the bedding for the entire length of pipe barrels. Suitable holes shall be dug for bells or couplings to provide ample space for jointing pipe.

G. When ledge is encountered in the bottom of the trench, pipe shall be bedded on a layer of crushed stone having a minimum thickness of 6 inches. Blocking is not permitted.

H. Each pipe section shall be placed into position on the pipe bed in such a manner and by such means required to avoid injury to persons, any property, or the pipe. The bell end shall be protected from damage.

I. Permanent blocking under the pipe is not permitted except where a concrete cradle is required, in which case precast concrete blocks shall be used.

J. Jointing shall conform to the manufacturer's instructions and appropriate ASTM Standards.

K. Any debris, tools etc. shall be removed from the pipe.

L. After placing the pipe on the bedding, the bedding material shall be placed and compacted to the spring line (horizontal centerline) of the pipe.

M. Following placement of the bedding material, the blanket material shall be placed and compacted from the spring line to 12 inches above the crown of the pipe. Then placement of the tracer tape.

N. After placement of the blanket material the pipe shall be checked for alignment and grade. If the pipe has been properly installed, the CONTRACTOR may refill or backfill the remainder of the

trench in conformance with Section 02224 and details shown on the Drawings.

- O. At the end of each day's work or at other intervals, the ENGINEER, with the CONTRACTOR will inspect the pipe installation. Unsatisfactory work shall be dug up and reinstalled to meet the requirements of the Contract Documents with no additional time allowed for completion of the Work and at no additional cost to the OWNER.
- P. When cutting of pipe is required, the cutting shall be done by machine (power cutter) without damage to the pipe or cement lining (if any). Cut ends shall be smooth and at right angles to the axis of the pipe. Pipe ends to be used with a rubber gasket joint shall be beveled and filed or ground smoothly to conform to a manufactured spigot end.

3.04 SERVICE CONNECTIONS

- A. House service lines shall be laid from the wye connection on the main line sewer to the property line as directed by the ENGINEER.
- B. All new service connections shall be the diameter specified in the drawings or as directed by the engineer. Fittings including bends, reducers and "fully shielded" Fernco couplings or maxadapters shall be provided to reinstate sewer service connection as required.

3.05 EXCAVATED SPOT REPAIRS

- A. The Contractor shall make excavations to such widths and depths as specified, in the General Conditions herein to give suitable space for laying and jointing the pipe, shall furnish and place sheeting and bracing as required, shall perform dewatering operations as necessary, shall backfill and compact the excavations, and shall dispose of surplus excavated material, all as indicated on the drawings or directed by the Engineer for repair of collapsed or broken pipe.

3.06 TESTING

- A. General
 - 1. Leakage tests under the direction of the ENGINEER shall be conducted on all pipes installed under this section of the Work. Deflection tests shall be conducted on PVC pipe as ordered by ENGINEER. The ENGINEER shall witness all tests. The CONTRACTOR shall supply all plugs, pumps, weirs, gauges, water, water trucks, mandrels, etc., necessary to conduct the tests. Should the Work fail the leakage or deflection tests, corrective action shall be taken by the CONTRACTOR in a manner approved by the ENGINEER and, if directed by the ENGINEER, the CONTRACTOR shall dig up and relay the failed section with no additional time allowed for completion of the Work and at no additional cost to the OWNER.
 - 2. The use of sealants, applied from the inside of the pipe, is not acceptable.
 - 3. Flush all piping systems with water prior to testing.
 - 4. Testing forms which indicate all testing information and results shall be submitted to ENGINEER.
- B. Force Main Testing: Force mains shall be tested for pressure and leakage in accordance with AWWA C600, except as amended or added below:
 - 1. Water to be furnished by CONTRACTOR.
 - 2. Test Duration: 2 hours.

3. Test Pressure: 150% of maximum operating pressure as determined by the ENGINEER.
4. Allowable Pressure Loss: Pressure shall not vary more than ± 5 psi for the duration of the pressure test.
5. Allowable Leakage: Allowable leakage shall be determined by the following formula:

$$L = \frac{SD/- P}{133200}$$

L = allowable leakage, in gallons per hour.

S = length of pipe tested, in feet.

D = nominal pipe diameter, in inches.

P = average test pressure, in psi (gauge).

6. Allowable leakage, in gallons per hour, per 1000 feet of pipe line can be determined from the following chart.

Pipe Dia. (in.)	Min. Time (min: sec)	Length For Min. Time (ft)	Time For Longer Length (sec)	Time (min:sec) for Length (L) Shown					
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft
4	3:46	597	.380 L	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
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05	19:56
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46
27	25:30	88	17.306 L	28:51	43:16	57:41	72:07	86:32	100:57
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50	124:38
33	31:10	72	25.852 L	43:05	64:38	86:10	107:43	129:16	150:43
36	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29

C. Sanitary Sewer Pipe Testing With All Service Connections Capped Using the Following Infiltration or Exfiltration Test Methods:

1. Infiltration: When the groundwater is two feet or more above the crown of the pipe at the upper end of the section to be tested, an infiltration test shall be made. The upper end of the section to be tested shall be plugged and a V-notch weir of appropriate size shall be fitted into the lower end so as to prevent leakage around the weir plate. Commercially manufactured weir plates made and calibrated for the purpose may be used.
2. Exfiltration:
 - a. Water Test: When groundwater is not present as described above, an exfiltration test shall be made. The sewer shall be plugged at the lower manhole in the outlet pipe and at the upper manhole in the inlet pipe. Water shall be introduced at the lower manhole and the line filled to a point four to six feet above the crown of the pipe at the upper end. Before any measurements are made, a period of about 2 hours should be permitted to allow for absorption and escape of any trapped air. The loss

of water from the system over a period of at least four hours shall then be measured and the leakage rate calculated.

b. Air Test: Leakage testing by means of low-pressure air will be permitted when the procedures described in UNI-B-6 are used. The maximum allowable pressure drop from the test pressure shall be 1.0 psig during the minimum holding time.

1) Test pressure shall be calculated using the following equation:

$$P = 3.5 + \frac{H}{2.31} \text{ (psig)}$$

P = Test pressure, maximum of 9 psi.

H = Height of groundwater above invert.

2) Minimum holding time required for a 1.0 psig maximum pressure drop shall be calculated using the following chart.

Pipe Dia. (in.)	Min. Time (min: sec)	Length for Min. Time (ft)	Time for Longer Length (sec)	Time (min:sec) for Length (L) Shown					
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft
4	3:46	597	.380L	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	.854L	5:40	5:40	5:40	5:40	5:40	5:40
8	7:34	298	1.520L	7:34	7:34	7:34	7:34	7:36	8:52

c. Allowable Leakage: The infiltration or exfiltration leakage shall not exceed 100 gallons per inch of pipe diameter per mile of pipe per day.

d. Deflection Test: Optional devices for testing include calibrated television, photography, properly sized "GO-NO-GO" mandrel, sewer ball or deflectometer. Maximum allowable pipe deflection shall be 5%. The deflection test shall be performed no sooner than 30 days after installation.

3.07 SEWER LINES AND SERVICES AND DRAIN LINES

A. The Contractor shall exercise caution to properly protect the existing utility services including water, telephone, gas and electric and pipes from construction damage. It shall be the Contractor's responsibility to demonstrate that all existing active services and pipes are functioning properly after the installation of the proposed sewer lines and services and drain lines to the satisfaction of the Engineer.

B. Damage to existing utility services shall be repaired and/or replaced with materials of the same size as the existing service. Existing slopes and invert shall be maintained. Pipe joints shall be made using suitable flexible couplings, approved by the Engineer.

B. If damage occurs to existing house or business utility services and acceptable repairs are accomplished as outlined above, the Contractor shall be required to adequately demonstrate to the Engineer that the repaired service is functioning normally before any backfill material shall be allowed to be placed.

3.08 TELEVISION INSPECTION

- A. After the completion of the backfilling of each section of new pipe, as defined as a length of pipe between two manholes, the Contractor will provide a televised inspection of the pipe to be presented to the Engineer. The inspector of Engineer shall be present during the taping. Submissions shall be DVD format, color, audio disc and will show a clear picture of the inside of the new pipe. If the Engineer determines that the tape is unacceptable for review the Contractor shall re-televise the line until an acceptable DVD has been submitted. No payment for the pipe shall be made until the Engineer has reviewed the tape and accepted the pipe. In the event that the pipe is not acceptable for any reason relating to the proper construction of the pipe according to these specifications, the Contractor will be responsible to re-excavate and repair the defects to the satisfaction of the Engineer at no additional cost.
- B. The payment for the televised inspection will be incidental to the laying of the pipe.

END OF SECTION

SECTION 02766
CONTROL OF WASTEWATER FLOW

PART 1 GENERAL

1.01 SCOPE

A. The work of this section consists of furnishing all labor and materials required to control and fully maintain all wastewater flow in the sewer lines being worked on and as determined by the Engineer.

1.02 DESIGN CRITERIA

A. The work covered by this specification shall be in accordance with the best practice of the industry. The specifications call attention to certain features but do not purport to cover all details entering into the required work.

1.03 SUBMITTALS

A. A control of wastewater flow plan shall be submitted for the Duplex Pump System Installation to verify how wastewater flow will be maintained and what procedures will be used, including but not limited to plugging and bypass pumping, pumping equipment, etc..

1.04 PAYMENT

A. Payment for the work described in this section will be made in accordance with the provisions of Section 01025, Measurement and Payment. Payment is included in other items of work under this contract requiring a control of wastewater flows and is considered incidental to those items.

PART 2 PRODUCTS

2.01 MATERIALS

A. Not applicable.

PART 3 EXECUTION

3.01 GENERAL

A. When the depth of flow in the sewer line is above the maximum allowable set forth for the type of work being performed in the applicable section of these specifications, one or more of the following methods of flow control shall be used.

1. Plugging or Blocking

a. A sewer line plug shall be inserted into the sewer pipe(s) at a manhole upstream from the section in which the work is to be performed. The plug shall be so designed that all or any portion of the sewage flow can be released.

2. Plugging with Flow Through Test Plugs

a. When the situation warrants and to avoid bypass pumping flow through test plugs may be used. These plugs shall have an inflatable bladder which allows the bladder to expand inside the existing carrier pipe and accept a temporary carrier pipe of 2/3 diameter of the existing carrier pipe.

b. When performing excavate and replace operations flow through plugs may be used around the carrier pipe from the new piece of pipe to the existing pipe, maintaining full flow capabilities. This may be done during evenings between each day's work and for weekends.

3. Pumping and Bypassing

a. When temporary pumping/bypassing is required, the Contractor shall supply the necessary pumps, conduits and other equipment to divert the flow of sewage around the section in which work is to be performed. The Contractor will be responsible for furnishing the necessary labor and supervision to set up and operate the pumping and bypassing system. Bypass pumping shall only be performed during working hours. The gravity sewers shall be reconnected at the end of each work day.

B. The Contractor shall conduct his work so as not to cause excessive surcharging of the sewerage system and shall not cause damage to the sewerage system, its connections and/or apparatus. Any damage caused by the Contractor's operation shall be repaired to the complete satisfaction of the Engineer and at no additional cost to the Owner.

3.02 CLEAN-UP

A. The Contractor shall be responsible for the disposal of excess material and general clean-up of the work area which will be subject to approval by the Engineer.

END OF SECTION

SECTION 02925

LOAMING AND SEEDING

PART 1 GENERAL

1.01 SCOPE

- A. The work of this section of the specifications includes all labor, materials, tools, and equipment required to furnish and install loam and seeding in the unpaved areas designated on the contract drawings, disturbed by the CONTRACTOR's operations and work, or any cross-country or lawn areas disturbed by the CONTRACTOR's operations during the course of construction.

1.02 ENVIRONMENTAL CONDITIONS

- A. The planting season for grass shall be from April 15 to October 1, except as otherwise authorized by the Engineer.

1.03 SUBMITTALS

- A. The following information shall be submitted in accordance with the General Conditions and in Section 01015 Special Requirements.

1.04 MEASUREMENT AND PAYMENT

- A. Measurement and payment for work described in this section will be made in accordance with the provisions of Section 01025.

PART 2 MATERIALS

2.01 LOAM

- A. Loam excavated and stock piled may be used if approved by the ENGINEER. If stockpiled loam is insufficient or unsuitable, additional material shall be supplied from off-site sources. All loam shall be a "fine sandy loam" or a "sandy loam" as based on the USDA classification system. It shall be of uniform composition, without mixture of subsoil, free from stones larger than one inch in diameter, lumps, plants, clay, peat, root and other extraneous matter. Loam shall not be delivered or worked in a frozen or muddy condition.

2.02 LIME

- A. Shall be standard commercial ground limestone and shall be applied at a rate of 50 pounds per 1000 square feet.

2.03 COMMERCIAL FERTILIZER

- A. Shall be standard 10-10-10 dry granular mixture, delivered in the manufacturer's containers and containing a guaranteed analysis by weight of at least 10 parts Nitrogen, 10 parts Phosphorous and 10 parts Potash, applied at the rate of 10 lbs. per 1000 sq. ft.

2.04 GRASS SEED

- A. Shall be fresh, clean, new crop seed. Seed shall be delivered to the work site in sealed container with each container bearing the dealer's guaranteed analysis showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging. Lawn seed shall be composed substantially as follows with a percentage of purity and germination as listed. The CONTRACTOR shall submit this information to the ENGINEER

per Section 01015.

1. Seed Mixture.

a. LAWN AREAS

<u>Kinds of Grass</u>	<u>% by Weight</u>	<u>% Purity</u>	<u>% Germination</u>
Chewing Fescue	30	97	90
Kentucky 31 Fescue	30	98	90
Kentucky Bluegrass	20	98	90
Domestic Ryegrass	20	98	90

NOTE: Weeds and inert material shall not exceed 1 percent.

b. CROSS-COUNTRY AREAS

Disturbed areas other than lawns shall be seeded with the following:

<u>Kinds of Grass</u>	<u>% by Weight</u>	<u>% Purity</u>	<u>% Germination</u>
Creeping Red Fescue	30	97	90
Alta Fescue	30	98	90
Domestic Ryegrass	20	98	90
Alsike Clover	20	98	90

NOTE: Weeds and inert material shall not exceed 1 percent. Weeds: Includes Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lamsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Garlic, Perennial Sorrel, Brome Grass, and any other plant growth not listed in the cross country or lawn area seed mixtures.

c. EROSION CONTROL AREAS

Seed mixtures for erosion control shall be as noted on erosion controls details on contract drawings.

2.05 WOVEN JUTE MESH NETTING

A. Shall be "Ludlow Soil Saver," as manufactured by the Ludlow Corp., Needham Height, Mass., or an equal as manufactured by Advance Netting Company, Lodi, NJ or "Jute-Net" by Bemis, Inc., St. Louis, MO, or equal.

2.06 STRAW OR HAY

A. For erosion control and moisture retention shall consist of stems or stalks after threshing. Hay shall consist of a mowed, properly cured grass, clover or other acceptable plant. Straw or hay shall be kept in place by stakes, netting, pins or liquid coatings as may be required and as approved by the ENGINEER.

PART 3 EXECUTION

3.01 EROSION CONTROL

- A. Hay or straw shall be used on a slope of 2:1 when the height of a continuous slope is five feet or greater, on all slopes greater than 2:1, and any areas subject to concentrated run-off likely to produce gulleying and/or erosion. Mesh netting shall be used when the application of hay or straw will not provide sufficient erosion control.
 1. Mesh netting shall be installed in accordance with accepted practices and the manufacturer's instructions and recommendations. Fastenings shall be as supplied or recommended by the manufacturer, subject to approval by the ENGINEER.
 2. Netting shall be applied in a direction most economical to the grade and slope encountered.
 3. Netting must lay loose on the grade, and shall not be stretched or tightened in any direction. The netting shall conform naturally to the contour and grade of the proposed topography.
 4. Anchor slots, intersection, with structures, walls, curbs, etc., side and junction overlaps and terminal folds shall be made and fastened in accordance with the manufacturer's recommendations or as approved or directed by the ENGINEER.

3.02 GRADING AND SEEDING OPERATIONS

- A. Personnel for lawn work shall be familiar with lawn construction and shall be under the constant supervision of a qualified foreman.
- B. Grading and Topsoil Placement.
 1. Preparation of Subgrade. The CONTRACTOR shall do whatever grading is necessary to bring the subgrade to a true smooth slope, parallel to finish grade or to the level of adjacent existing loam areas.

Subgrade depth for Lawn Areas - 8 inches minimum or equal to original depth, whichever is greater (all stockpiled material shall be placed back even if greater than 8 inches).

Subgrade depth for Cross Country Areas - 6 inches minimum or equal to original depth, whichever is greater (all stockpiled material shall be replaced back even if greater than 6 inches).
 2. The top three inches of the subgrade immediately prior to being covered with loam shall be raked or otherwise loosened and shall be free from stones, rock and other foreign materials three inches or greater in dimensions.
 3. Sufficient grade stakes shall be provided to insure correct line and grade of subgrade and of finished grade.
 4. Subgrade shall be to a true smooth slope before placing of loam.
 5. Loam shall be as specified above, and shall be placed and spread over approved areas to a sufficient depth so that after natural settlement and light rolling for lawn areas, the completed work will conform to the lines, grades and elevations indicated. Depth or thickness of loam (topsoil) shall be equal to the depth of sub-grade below final elevation.

6. Finish grading. After loam has been spread, it shall be prepared by scarifying or harrowing and hand raking. All large stiff clods, lumps, brush, roots, stumps, litter and other foreign matter, and stones over 1 inch in diameter shall be removed from the loam which shall also be free of smaller stones in excessive quantities.
7. The surface for lawn areas shall then be rolled with a hand roller weighing not more than 100 lbs. per foot of width.
8. During the rolling, all depressions caused by settlement of rolling shall be filled with additional loam and the surface shall be regarded and rolled until presenting a smooth and even finish to the required grade.
9. Subsequent to or during raking of the loam and at least four days prior to seeding, lime shall be applied and raked into the soil over all loam areas.
10. After the lime has been applied and worked into the loam, the entire area shall receive an application of commercial fertilizer. Fertilizer shall be spread in advance of seeding by approved mechanical spreading devices and lightly taken into the top of the soil.

C. Placement of Seed.

1. Seed shall be spread at least four days after fertilization of the soil by an approved mechanical method and at the rate of eight (8) pounds per thousand square feet. Seed shall be lightly raked into the soil to a depth of approximately 1/8-inch (and no more than 1/4-inch) and the entire seeded area shall be rolled with a lightweight roller.
2. Seeding shall not be done during windy weather.
3. For lawn areas, seeding shall be done in three directions, two at right angles to each other, and one diagonally.
4. Culti-packer or approved similar equipment may be used to cover the seed and to form the seed bed in one operation.
5. Immediately after seeding, all seeded areas shall be watered to a depth of approximately four inches and shall be covered with a loose, uniform layer of straw or hay. Watering will be done daily.

3.03 HYDROSEEDING

- A. Apply seeded slurry at a rate of 10 lbs. of seed per 1000 sq. ft. based only on seed content evenly in two intersecting directions, with a hydraulic seeder. Do not hydroseed an area in excess of that which could be protected and watered on the same day.
- B. Immediately following seeding, apply erosion control as specified.
- C. Apply water with a fine spray immediately. Saturate to four inches of soil.

3.04 MAINTENANCE AND PROTECTION

- A. Maintenance shall begin immediately after each portion of lawn is installed.
- B. Maintenance and protection of seeded areas shall consist of temporary protective fences, barriers, signs, watering, weeding, cutting, and reseeding as necessary, as well as maintaining the straw or hay cover in a uniform layer.

- C. Lawns shall be maintained until substantial completion of the project or until acceptance of lawns, whichever is longer.
- D. The surface layer of soil shall be kept damp during the germination period. After first cutting of Lawn Areas, watering shall be twice per week.
- E. Bi-weekly inspection shall be made to determine the moisture content of the soil and approved watering schedule shall be adjusted to fit conditions.
- F. At the time of the first cutting, when grass is between four inches and six inches high, mower blades shall be set at 22 inches high. All areas shall receive at least two mowings before acceptance. After two cuttings but not until substantial completion, any further mowing required shall be at the OWNER's expense. The CONTRACTOR shall be responsible for the first two cuttings until the lawn is accepted by the ENGINEER and substantial completion, whichever is later.
- G. All clippings in lawn areas shall be removed after each mowing. Mowing shall be done only in dry weather.
- H. Excessive weeds shall be removed.
- I. The CONTRACTOR shall repair bare spots and/or damage resulting from erosion, gulleys, washouts, or other causes by filling with topsoil if damage occurs prior to acceptance.
- J. In the event that lawn operations are completed too late in the fall for adequate germination and/or growth of grass, maintenance shall continue into the following spring.

3.05 ACCEPTANCE

- A. An acceptable lawn shall be one that has a dense, uniform stand of the specified grasses. It shall be free of ruts, gullies, bare spots, and the grass shall be healthy and free of weeds.
- B. After completion of all landscaping work, all debris and excess material shall be disposed of in accordance Section 02224 - Trenching. All pavements shall be broomed and hosed (washed) clean.

END OF SECTION

SECTION 02990

MISCELLANEOUS WORK AND CLEANING UP

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Furnishing all labor, materials, equipment, and incidentals required to do all miscellaneous work and cleaning up not otherwise specified including, but not limited to, the following:
 - 1. Cleaning the construction site.
 - 2. Disposing of material and debris.
 - 3. Furnishing, installing and removing project signs.
 - 4. All other work incidental to completing the project.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 CLEANUP

- A. Remove all construction material, excess excavation, equipment or other debris remaining on the construction site as a result of construction operations and shall render the site of the work in a neat and orderly condition at least equal to that which existed prior to the start of construction.
- B. Dispose of all materials and debris off-site in accordance with local, state and federal regulations.

3.02 INCIDENTAL WORK

- A. Do all incidental work not otherwise specified but obviously necessary to the proper completion of the Contract as specified and as shown on the Drawings.

END OF SECTION

DIVISION 11 – EQUIPMENT

DIVISION 11 - EQUIPMENT

11307 - Sewage Grinder Pump Station

SECTION 11307

SEWAGE GRINDER PUMP STATION

PART 1 GENERAL

1.01 WORK INCLUDED

- A. The CONTRACTOR shall furnish and install factory-built grinder pump station, consisting of two grinder pump core units and all necessary parts, controls and appurtenances as shown on the Drawings. This section covers the work necessary to furnish and install, complete the high-density polyethylene (HDPE) or Polyvinyl chloride (PVC) pipe, fittings, connections, and appurtenances for gravity sewer and low-pressure sewer service.

1.02 GENERAL

- A. Like items of material provided hereunder shall be the end products of one manufacturer.
- B. Material and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture of the type of pumps specified and that have been in satisfactory use at least two years prior to bid opening.
- C. The pumps and motors shall be designed and constructed to avoid the generation of objectionable noise or vibration. The sound pressure level at full load shall not exceed 90 (A Scale) decibels above 300 cycles when measured at a point not exceeding 5 feet from the motor. When operating at any point between no-load and full load, the vibration measured in a horizontal plane at the top of the motor shall not exceed five mils displacement from peak to peak.
- D. Like items of material provided hereunder shall be the end products of one manufacturer.
- E. All pipe sizes shown on the Drawings and specified here are "ductile iron pipe size (DIPS)" unless otherwise indicated.
- F. High density polyethylene pipe is designated as "HDPE" on the Drawings.

1.03 REFERENCE STANDARDS

- A. ASTM D3350 – High Density Polyethylene Pipe and Fittings.
- B. AWWA C600 – Installation of Ductile Iron Water Mains and Their Appurtenances.
- C. AWWA C651 – Disinfecting Water Mains.
- D. AWWA C906 – Polyethylene (PE) Pressure Pipe and Fittings, 4" (100mm) through 63" (1,575mm) for Water Distribution and Transmission.
- E. ANSI/AWWA C901 Polyethylene (PE) Pressure Pipe and Tubing, ½ In. (13 mm) Through 3 In. or ASTM F714
- F. ASTM A126 - Gray Iron Castings for Valves, Flanges and Pipe Fittings.
- G. The Hydraulic Institute - Hydraulic Institute Standards.
- H. NFPA - National Fire Protection Association.

1.04 SUBMITTALS

- A. Submit shop drawings in accordance with Section 01300 Submittals and section 01340 Shop Drawings, Product Data and Samples.
- B. Submit four (4) sets of operating and maintenance instructions for each pump station. The instructions shall include a complete parts list and shall include all appurtenances and controls furnished with the pumps.
- C. Submit pump characteristic curves showing capacity in GPM, NPSH, head, efficiency, and pumping horsepower from 0 GPM to 110 percent of design capacity.
- D. A statement, in writing, from the pipe manufacturer that it is listed with the Plastic Pipe Institute as a qualified extruder for the polyethylene resin being used to manufacturer the pipe for this project.
- B. Catalog information and manufacturer's data sheets confirming that the pipe and fittings conform to the requirements of PART 2 PRODUCTS of this Specification.

1.05 RELATED SECTIONS

- A. SECTION 02730 SANITARY SEWERS & FORCE MAINS

PART 2 PRODUCTS

2.01 ACCEPTABLE PUMP STATION MANUFACTURERS

- A. Specification includes references to designated manufacturers to illustrate minimum acceptable requirements for products. Sewage grinder pump specification based on grinder pump (Model DH152-93) duplex grinder pump station as a complete unit that includes: two grinder pumps, check valve, HDPE (high density polyethylene) tank, controls, and alarm panel manufactured by Environment One Corp. or approved equal.
- B. Substitutions: Products of equal or better quality, detail, function, and performance may be proposed for substitution by following the procedures in Section

2.02 PUMPS

- A. The pumps shall be of a semi-positive displacement type and be capable of delivering 9 gpm against a rated total dynamic head of 138 feet (60 psig). At zero head, the output shall be at least 15 gpm minimum.
- B. The pumps shall be a custom designed, integral, vertical rotor, motor driven, solids handling pumps of the progressing cavity type with a single mechanical seal. The rotors shall be through-hardened, highly polished, precipitation hardened stainless steel. The stators shall be of a specifically compounded ethylene propylene synthetic elastomer. The material shall be suited for domestic wastewater service. Its physical properties shall include high tear and abrasion resistance, grease resistance, water and detergent resistance, temperature stability, good aging properties, and outstanding wear resistance.

2.03 GRINDER

- A. The grinder shall be positioned immediately below the pumping elements and shall be direct-driven by a single, one-piece stainless steel motor shaft. The grinder impeller assembly shall be securely fastened to the pump motor shaft. The grinder shall be of the rotating type with a stationary hardened and ground chrome steel shredding ring spaced in accurate close annular alignment to the driven impeller assembly, which shall carry two hardened type 400 series

stainless steel cutter bars. This assembly shall operate without objectionable noise or vibration over the entire range of recommended operating pressures.

- B. The grinders shall be capable of reducing all components in normal domestic sewage, including a reasonable amount of "foreign objects", such as paper, wood, plastic, glass, rubber and the like, to finely divided particles which will pass freely through the passages of the pumps and the 1-1/4" diameter discharge pipe.
- C. The grinders shall be constructed so as to eliminate clogging and jamming under all normal operating conditions including starting. Sufficient vortex action shall be created to scour tank free of deposits or sludge banks which would impair the operation of the pumps. These requirements shall be accomplished by the following, in conjunction with the pumps.
 - 1. The grinders shall be positioned in such a way that solids are fed in an upward flow direction.
 - 2. The inlet opening shall have a diameter no less than 5 inches.
 - 3. At maximum flow, the average inlet velocity must not exceed 0.2 feet per second.
 - 4. The impeller mechanism must rotate at a nominal speed of no greater than 1800 rpm

2.04 STAINLESS STEEL LATERAL VALVE

- A. Curb boxes shall be constructed of ABS, conforming to ASTM-D 1788. Lid top casting shall be cast iron, conforming to ASTM A-48 Class 25, providing magnetic detectability, and be painted black. The lid shall have the word "sewer" cast into it. All components shall be inherently corrosion-resistant to ensure durability in the ground. Curb boxes shall provide height adjustment downward (shorter) from their nominal height.

2.05 SEWER SERVICE CURB BOX

- A. Specification "E/One" requires that the Uni-Lateral, E/One's own stainless steel check valve, be installed between the grinder pump station and the force main for added protection against backflow. A 1.25-inch size, Uni-lateral all 316 stainless steel construction lateral valve installed for use with E/One grinder pump station shall an integrated unit consisting of a check valve, ball valve and cleanout all in a compact module.
- B. The stainless-steel lateral valve shall be installed and accessed between the sewer main and sewer service line to protect against backflow.
- C. 1-1/4" full-port design designed for use with PVC and HDPE pressure sewer piping.
- D. Available Adapter Fittings: 1-1/4" compression type fittings for HDPE, SDR PIPE PER ASTM 3035 (SDR11) and PVC (SDR21).

2.06 ELECTRIC MOTORS

- A. The motors shall be 1hp, 1725 rpm, 120/240V, 60 Hz, single phase ball bearing, high torque, capacitor start, thermally protected, squirrel cage induction type.
- B. Inherent protection against running overloads or locked rotor conditions for the pump motors shall be provided by the use of an automatic-reset, integral thermal overload protector incorporated into the motor.

2.07 MECHANICAL SEAL

A. A. The core shall be provided with a mechanical shaft seal to preclude leakage between the motor and pump. The seal shall have a stationary ceramic seat and carbon rotating sealing surface with face precision lapped and held in position by a stainless-steel spring.

2.08 INTEGRAL VALVES

A. The pumps shall be equipped with an integral, factory-installed, gravity-operated (flapper-type integral) check valve to prevent drainage back into the collection tank, (built into the discharge pipe).

B. The pumps shall be equipped with an integral anti-siphon vacuum relief valve in the discharge piping just below the integral check valve to ensure the pumps cannot lose prime even under negative pressure conditions.

2.09 CONTROLS

A. Necessary controls shall be integral with the grinder pumps and shall be designed for exterior mounted in a NEMA 4X, UL listed alarm/disconnect panel.

B. Non-fouling wastewater level detection for controlling pump operation shall be accomplished by monitoring the pressure changes in an integral, air-bell level sensor connected through air-tight tubing to a pressure switch. The level detection device shall have no moving parts in direct contact with the wastewater.

C. Each level control shall have its own built-in fail-safe design which will prevent the entrance of moisture into the controls in case of switch diaphragm failure.

D. To assure reliable operation of pressure sensitive switches, each core shall be equipped with a quick disconnect breather assembly, complete with check valve to prevent accidental entry of water into the motor compartment.

2.11 WIRING

A. The CONTRACTOR shall install, in accordance with Division 16 specifications, service entrance equipment and/or branch circuit protection and all wiring to the grinder pump control box. The CONTRACTOR shall provide all wiring between the grinder pump and the control box in accordance with the manufacturer's instructions. All electrical work shall comply with appropriate national and local codes.

B. The grinder pumps will be furnished with a power supply cable of sufficient lengths of type UP cable, pre-wired and connected with weatherproof materials. The power supply cable shall be 12-2 W.GRD., designed for 1-phase, 240-volt, 60 Hertz power supply, and meet UL requirements. The signal cable to the overflow indicator lamp shall be 14-2 W.GRD., designed for 1 phase, 120 volts, 60 Hertz power supply, and meet UL requirements.

2.12 COLLECTION TANK

A. The tank shall be made the tank shall be made of high-density polyethylene of a grade selected for environmental stress cracking resistance. Corrugated sections are to be made of a double wall construction with the internal wall being generally smooth to promote scouring. Corrugations of outside wall are to be of a minimum amplitude of 1 ½" to provide necessary transverse stiffness. Any incidental sections of a single wall construction are to be a minimum .250 inch thick. All seams created during tank construction are to be thermally welded and factory tested for leak tightness. Tank wall and bottom must withstand the pressure exerted by

saturated soil loading at maximum burial depth. All station components must function normally when exposed to maximum external soil and hydrostatic pressure. Provide concrete ballast if below groundwater elevation.

- B. The tank shall be furnished with an EPDM grommet fitting to accept a 4.50" OD DWV pipe.
- C. The accessway shall be an integral extension of the wet well assembly and include a lockable cover assembly providing low profile mounting and water-tight capability. Accessway design and construction shall facilitate field adjustment of station height in increments of 4" or less without the use of any adhesives or sealants requiring cure time before installation can be completed. The station shall have necessary penetrations molded in and factory sealed. No field penetrations shall be acceptable.
- D. All discharge piping shall be constructed of 304 Series Stainless Steel and terminate outside the accessway bulkhead with a stainless steel, 1 1/4 inch female NPT fitting. Pump discharge terminates in 1.25-inch NPT female thread that is required to be adapted to 1.25-inch discharge piping material. The discharge piping shall include a stainless-steel ball valve rated for 200 psi WOG. The bulkhead penetration shall be factory installed and warranted by the manufacturer to be watertight.
- E. The accessway shall include a single NEMA 6P electrical quick disconnect, for each pump, for all power and control functions, factory installed with accessway penetrations warranted by the manufacturer to be watertight. The accessway shall also include a 2-inch PVC vent to prevent sewage gases from accumulating in the tank.

2.13 CORROSION PROTECTION

- A. All materials exposed to wastewater shall have inherent corrosion protection; i.e., cast iron, fiberglass, stainless steel, PVC. Any exterior steel surfaces are to suitably protect against corrosion.

2.14 ALARM/DISCONNECT PANEL

- A. Each grinder pump station shall include a NEMA 4X, UL listed ALARM/DISCONNECT PANEL suitable for wall or pole mounting. The NEMA 4X enclosure shall be manufactured of thermoplastic to assure corrosion resistance. The enclosure shall include a hinged, pad lockable cover, secured dead front and component knockouts.
- B. The panel shall contain factory provided breakers for the pumps and alarm circuit. The panel shall contain terminal blocks, integral power bus, push to run feature and a complete alarm circuit.
- C. The Alarm/Disconnect Panel shall include the following features:
 1. Audio and visual alarm
 2. Run indicator lights
 3. Manual push to run switch
- D. The alarm sequence is to be as follows:
 1. When liquid level rises above the alarm level, visual and audio alarms will be activated. The contacts on the alarm pressure switch will close. The redundant pump starting system will be energized.

2. The audio alarm may be silenced by means of the externally mounted, push-to-silence button.
3. Visual alarm remains illuminated until the sewage level in the wetwell drops below the A_{off} setting of the alarm pressure switch.

E. The visual alarm lamp shall be inside a red fluted lens at least 2 4/8" in diameter and 1 11/16" in height. Visual alarm shall be mounted to the top of the enclosure in such a manner as to maintain NEMA 4X rating. For duplex units, in addition to the above, two high level indicator lights shall be mounted behind the access cover.

F. During a high-level alarm condition the appropriate light will illuminate to indicate which pump core requires servicing. The audio alarm shall be a printed circuit board in conjunction with an 86 dB buzzer with quick mounting terminal strip mounted in the interior of the enclosure. The audio alarm shall be capable of being de-activated by depressing a push-type switch which is encapsulated in a weatherproof silicone boot and mounted on the bottom of the enclosure.

G. The entire Alarm/Disconnect Panel as manufactured, shall be listed in Underwriters Laboratories, Inc.

H. A second visual alarm lamp shall be mounted to a panel inside the residence to indicate when there is an alarm condition with the pump system as described in 2.14 Part D. The Installer shall coordinate the install location with the owner of the residence.

2.14 POWER AND ALARM CABLES

A. Each grinder pump will be furnished with a power supply and alarm cables of sufficient length to connect with the alarm/disconnect panel without the use of splicer to the pump unit. Contractor to field verify lengths required.

2.15 SERVICEABILITY

A. Each grinder pump core unit shall have lifting hooks complete with nylon lift-out harness connected to its top housing to facilitate easy core removal when necessary. All mechanical and electrical connections must provide easy disconnect accessibility for core unit removal and installation. A push to run feature will be provided for field trouble shooting. All motor control components shall be mounted on a readily replaceable bracket for ease of field service.

PART 3 EXECUTION

3.01 INSTALLATION

A. Pumping equipment and appurtenances shall be installed in the position indicated and in accordance with the manufacturer's instructions. All appurtenances required for a complete and operating pumping system shall be provided, including such items as piping, conduit, valves, wall sleeves, wall pipes, concrete foundations, anchors, grouting, pumps, drivers, power supply and controls.

3.02 STARTUP AND TESTING

A. The manufacturer shall provide the services of qualified factory trained technician(s) who shall inspect the placement and wiring of each station, perform field tests as specified herein, and instruct the OWNER=s personnel in the operation and maintenance of the equipment before the stations are accepted by the OWNER.

- B. All equipment and materials necessary to perform testing shall be the responsibility of the Installing CONTRACTOR. This will include, as a minimum, a portable generator (if temporary power is required) and water in each basin.
- C. The services of a trained factory authorized technician shall be provided at a rate of one (1) day, ten (10) person hours in duration.
- D. Upon completion of the installation, the authorized factory technician will perform the following test on each station.
 - 1. Make certain the discharge shut-off valve is fully open. This valve must not be closed when the pump is operating. In some installations, there may be a valve(s) at the street main that must also be open.
 - 2. Turn ON the alarm power circuit.
 - 3. Fill the wet well with water to a depth sufficient to verify the high-level alarm is operating. Shut off water.
 - 4. Turn ON pump power circuit. Initiate pump operation to verify automatic ^Aon/off[@] controls are operative. Pump should immediately turn ON. Within one (1) minute alarm light will turn OFF. Within three (3) minutes the pump will turn OFF.
 - 5. Upon completion of the start-up and testing, the Manufacturer shall submit to the ENGINEER the start-up authorization form describing the results of the tests performed for each Grinder Pump Station. Final acceptance of the system will not occur until authorization forms have been received for each pump station installed.

3.03 OPERATION AND MAINTENANCE

- A. Manuals: The Manufacturer shall supply four (4) copies of Operation and Maintenance Manuals to the OWNER, and one (1) copy of the same to the ENGINEER.

END OF SECTION

DIVISION 2 – ELECTRICAL

DIVISION 16 - ELECTRICAL

16001 - Electrical

SECTION 16001

ELECTRICAL

PART 1 GENERAL

1.01 EXTENT OF WORK

- A. The work specified in this Section includes requirements for furnishing all materials, labor, tools and equipment, and performing all operations necessary to complete all electrical systems, as shown on the Drawings and as specified herein.
- B. The work at #58 Summer Hill Rd shall include, but not be limited to the following items:
 - 1. Removal and disposal of existing 20 circuit, 100A, 120/240V panelboard, utility meter socket cabinet, service entrance wiring.
 - 2. Maintaining existing circuits in building and provide plywood backing and 225A, 120/240V, 42 circuit panelboard for reconnection of existing circuits.
 - 3. Upgrade of electrical service to building. New service shall be 200A, 120/240V, 1 Phase, 3 Wire. Contractor to coordinate work order service number and forms required with Eversource.
 - 4. Provide NEMA 3R utility meter socket cabinet per Eversource requirements.
 - 5. Installation of vendor provided Duplex Alarm panel and vendor provided cable to underground pump station and providing 120V power from proposed panelboard in basement.
 - 6. Provide conduit, wire, boxes, fittings, and all other associated equipment needed to complete new work.

1.02 WORK NOT INCLUDED

- A. The following items of work are not specified under this Section of the Specifications but are specified under other Sections, or are to be furnished by others, except that all wiring shall be done under this Section:
 - 1. Furnishing and installing motors/pumps for underground pump station, however all wiring for such devices shall be done under this section of the specifications.
 - 2. Furnishing Duplex Alarm panel, however all wiring between such devices and installation of panel shall be done under this section of the specifications.

1.03 DRAWINGS

- A. The Drawings, which constitute an integral part of this contract, shall serve as the working drawings. They indicate the general layout of the complete

electrical system or systems, arrangement of branch circuits, outlets, switches, controls, fixtures and other work.

- B. Field verification of scale dimensions on the Drawings is directed, since actual locations, distances and levels will be governed by actual field conditions.
- C. The Contractor shall also review Civil Drawings, shop drawings and all Specifications, and shall adjust his work to conform to all conditions indicated thereon.
- D. The Contractor shall be responsible for coordinating dimensions, for sleeves, mounting channels, conduits, etc., for equipment purchased by him.

1.04 STANDARDS, CODES AND REGULATIONS

- A. The Contractor shall furnish all materials in accordance with, and perform all work required so that the materials and installation shall conform to, the following standards, codes and regulations:
 - 1. National Fire Protection Association NFPA 70 National Electrical Code.
 - 2. Underwriters' Laboratories, Inc.- Standards for Cabinets and Boxes, Service Equipment, and Rubber Covered Wires and Cables.
 - 3. American National Standards Institute - Standards.
 - 4. National Electrical Manufacturing Association Standards.
 - 5. All applicable State and local codes or ordinances and requirements of the authority having jurisdiction.
 - 6. Insulated Power Cable Engineers Association Standards.
 - 7. American Society for Testing and Materials Standards.
 - 8. National Fire Protection Association-Pamphlet No. 31.
 - 9. Department of Public Safety regulations.
 - 10. Occupational Safety and Health Regulations.
 - 11. Institute of Electronic and Electrical Engineers Standards.
 - 12. ANSI C-2 National Electrical Safety Code
 - 13. Federal Specifications
 - 14. International Electrical Testing Association, Inc.
 - 15. Massachusetts Building Code 780CMR and Massachusetts Plumbing and Gas Code CMR428; or other State and Local Building Codes as adopted and/or amended by the Authority Having Jurisdiction (AHJ).

B. In the event that codes require a change in the material design, any such changes shall be submitted to the Engineer for approval before proceeding with the work. The Contractor shall comply with all local codes.

1.05 APPROVAL OF EQUIPMENT AND MATERIALS

A. Shop drawings shall be submitted in accordance with Section 01340 – SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. The shop drawings shall include catalog numbers, cuts, diagrams, detailed dimensioned shop drawings of equipment, wiring diagrams as required, drawings, samples as requested, and such other pertinent descriptive ratings and data as may be required by the Engineer. No consideration will be given to partial lists submitted from time to time on items which are interdependent for proper operation, coordination, etc. Approval of materials will be based on manufacturer's published ratings. Any equipment and materials listed which, in the opinion of the Engineer, are not in accordance with the Specification requirements, or requirements shown on the Drawings will be rejected and others shall be submitted. Equipment and materials which are installed by the Subcontractor without first having been approved by the Engineer shall be removed if installed and/or removed from the work site when so instructed by the Engineer. No payment will be made for unapproved equipment or material or for its installation if the Contractor is ordered to remove such equipment and material.

1.06 MATERIAL SUBSTITUTION

A. Should the Contractor desire to substitute other makes of materials, apparatus or appliances than those mentioned herein or shown on the Drawings, he shall do so in the following manner:

1. Submit a separate alternate proposal and provide a list of the proposed substitutions, manufacturer, brand name, catalog number, etc. and state what difference each will make (addition, deduction, no change) in the contract price. He shall also submit data and certified independent test, if requested, showing the proposed substitutions are equal to the specified types.
2. Where such substitutions alter the design or space requirements indicated on the Drawings, the Contractor shall include all items of cost for the revised design and construction, including cost of all allied trades involved, and at no additional cost to the Owner.
3. If requested by the Engineer, the Contractor shall furnish and deliver samples of both the specified and proposed substitute items to the Engineer's office at no additional cost.
4. If requested by the Engineer, the Contractor shall submit data showing quoted prices of specified and proposed substitute items. Acceptance or rejection of proposed substitute items will be the sole responsibility of the Engineer. The Contractor shall accept the Engineer's decision as final.

1.07 SLEEVES, INSERTS AND OPENINGS

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3. If requested by the Engineer, the Contractor shall furnish and deliver samples of both the specified and proposed substitute items to the Engineer's office at no additional cost.
4. If requested by the Engineer, the Contractor shall submit data showing quoted prices of specified and proposed substitute items. Acceptance or rejection of proposed substitute items will be the sole responsibility of the Engineer. The Contractor shall accept the Engineer's decision as final.

1.07 SLEEVES, INSERTS AND OPENINGS

A. The Contractor shall furnish and install all sleeves or openings through floors or walls required for passage of all conduits, pipes or ducts to be installed by him and if repairs are required due to errors and omissions or tardy installation, he shall have all patching and restoration to floors, ceilings or walls, including necessary painting, done by the trades involved after his work is installed and completed at no additional cost to the Owner. The

Contractor shall furnish and install all inserts and hangers required to support conduits, pull boxes, etc. If the sleeves, etc., are improperly installed, the Contractor shall do all necessary cutting and patching to rectify the errors at no additional cost to the Owner. Non-shrink grout shall be used on penetrations through interior masonry walls.

1.08 **SUPERVISION**

A. The Contractor shall personally or through an authorized and competent representative constantly supervise the work from its beginning to its completion and acceptance. He shall, so far as possible, keep the same foreman and workmen on the work from its commencement to its completion.

1.09 **COOPERATION WITH OTHER TRADES**

A. The Contractor before starting work shall confer with all other contractors interested in the location of pipes, ducts, pits, trenches or any other apparatus or fixtures to be installed by them and shall select his location so as not to interfere with the work and rights of the other trades. All differences or conflicting conditions shall be brought to the attention of the Engineer for adjustment before commencing work, and any such work or materials placed in position in violation of this clause shall be readjusted at no additional cost to the Owner.

B. The work shall be so performed that the program of the entire project, including all other trades, will not be interfered with. Materials and equipment shall be installed as fast as conditions of the building permit allow and shall be installed promptly when and as directed.

C. It shall be the Contractor's responsibility to check the Drawings and Specifications of the other trades for their requirements for electrical work and to accomplish the electrical work as approved by the Engineer.

1.10 **WARRANTY**

A. The electrical system or systems, together with the component units as included in this Section of the Specifications, shall be warranted for a period of one year from the date of final acceptance thereof against defective materials and workmanship. Upon receipt of notice from the Owner or Engineer of failure of any parts of the warranted equipment during the guarantee period, the affected part or parts shall be replaced promptly with new parts by and at the expense of the Contractor.

1.11 **ELECTRICAL SERVICE**

A. #58 Summer Hill Rd

1. The existing service to the #58 Summer Hill Rd building is 100A, 120/240V, 1 Phase, 3 Wire. The service shall be upgraded to be 120/240V, 200 Amperes, 3 Phase, 3 Wire. The existing feeder raceways & wiring, service entrance, and utility meter will all be removed, disposed of, and replaced. Meter socket for utility meter shall be provided as shown on the Drawings.
2. The electrical utility company is Eversource. All work for upgrading the service to the building shall be coordinated with Eversource and

completed in accordance with Eversource requirements. The Contractor shall be responsible for filing the required forms with Eversource, paying charges levied by the serving utilities, and obtaining permits and inspections required.

PART 2 PRODUCTS

2.01 GENERAL

A. All equipment and materials furnished by the Contractor shall be new and first grade, and as approved by the Underwriters' Laboratories, Inc., and/or by other standards mentioned in these Specifications. The materials to be furnished under this Specification shall be the standard products of manufacturers regularly engaged in the production of such equipment and shall be of the latest standard design. Equipment and materials shall be of the type and quality listed below.

2.02 WIRE AND CABLE

A. Wires and cables shall meet applicable requirements of NFPA 70 and UL for types of insulation, jacket, and conductor specified or indicated. Wire and cable shall be new and shall have the size, grade of insulation, voltage and manufacturer's name permanently marked on the outer covering at regular intervals and shall be delivered in complete coils or reels with identifying size, type and insulation tags. Wire and cable shall be suitably protected from weather and damage during storage and handling and shall be in first-class condition when installed.

B. Low voltage conductors (600 volts). Conductors shall be soft drawn annealed copper with heat- and moisture-resistant insulation, for 75- or 90-degrees C. service, type XHHW-2 or RHW-2 conforming to UL 44. Aluminum service entrance conductors shall be submitted for approval. Minimum wire size shall be No. 12 AWG. Conductors No. 8 and larger shall be stranded. Wire and cable No. 8 AWG and smaller shall be factory color-coded with a separate color for each phase and neutral used consistency throughout. Color-coding for 120/208 or 120/240-volt systems shall be used. Colors shall be black, red, and white for the lower voltage. Wire and cable No. 6 AWG and larger may be black and color coded at all terminations and splices. Conductors shall be as manufactured by Cablec Corporation, Rome Cable, Okonite Company, American Insulated Wire, Southwire Company or equal.

C. Grounding Cable.

1. Grounding cable installed in the raceways with circuit cables shall be single conductor, stranded, soft-drawn annealed copper, 600 volt, type THW conforming to UL 83, colored green.
2. Underground grounding conductors shall be bare copper conductors, stranded, 600V, conforming to ASTM B 8. Manufacturer for bare copper conductors shall be Burndy, Cooper/B-Line, Erico, Thomas & Betts, or approved equal.

2.03 CONDUIT AND CONDUIT FITTINGS

A. PVC coated rigid steel.

1. PVC coated rigid steel shall have a 40-mil thick, bonded polyvinyl chloride coating on the exterior and a 2-mil urethane coating on the interior.
2. All coated conduit shall conform to NEMA Standard RN-1.
3. All conduits, prior to coating shall conform to Federal Specification WW-C-581, ANSI Standard C80.1, and to Underwriters' Laboratories, Inc. UL-6.
4. The zinc surface of the conduit shall remain intact on both the inside and the outside of the conduit throughout the preparation and application processing. A polyvinyl chloride (PVC) coating shall be bonded to the galvanized outer surface of the conduit. The bond between the PVC coating and the conduit surface shall be greater than the tensile strength of the plastic. To meet the adhesion/bond, independent tests, using ASTM D870 Water Immersion Test (24 hour boil test), must confirm that the bond is greater than the tensile strength of the plastic. The conduit and fitting shall also be exposed to 150 degrees heat and 95 percent relative humidity with a minimum mean time to failure of 30 days (ASTM D1151). The thickness of the PVC coating shall be a nominal 40 mils thick.
5. A loose coupling shall be furnished with each length of conduit. A PVC coating shall be bonded to the outer surface of the coupling and a PVC sleeve equal to the outside diameter of the uncoated conduit shall extend beyond both ends of the coupling approximately one pipe diameter or 2 inches, whichever is smaller. The wall thickness of the coating on the coupling and the sleeve shall be at least as thick as the coating on the conduit. The coupling shall also have a urethane coating applied to the exterior, the interior and to the threads.
6. A wall thickness of the coating on conduit bodies and fittings and the sleeve walls shall be identical to those on couplings in length and thickness. The covers on all conduit bodies shall be coated on both sides and shall be designed to be completely interchangeable. Fittings shall have tongue-in-groove gasket. The inside of conduit bodies shall have a nominal 2 mil urethane coating inside.
7. All coated material shall be installed and patched according to the manufacturer's recommended installation and patching instructions. To ensure compliance, the "installer" shall be certified by the manufacturer.
8. The conduit shall be shipped with thread protectors installed on both ends and the couplings boxed separately. Conduit threads shall be hot-dipped galvanized and coated with polyurethane after the conduit has been PVC-coated.
9. Clips and other fittings used with PVC coated conduit shall have factory applied urethane and PVC coatings.

10. An interior touch-up compound shall be provided for field cut and exposed threads. An exterior touch-up compound shall be used on areas damaged during installation.
11. Conduit shall be as manufactured by Occidental Coatings Co., Robroy Industries, Perma-Cote Industries, or equal.

B. Rigid steel. Rigid steel conduit shall be mild hot-dipped galvanized steel piping not less than 3/4 inch size. The galvanized coating of zinc shall be of uniform thickness both inside and outside, and shall be applied to the threads of the conduit. The conduit shall be further protected by one or more of the following:

1. Electro-galvanized after hot-dipped galvanizing and/or
2. An alkaline cleaner bath and rinse and a chromic acid bath to form a film of zinc chromate over all and/or
3. A thin polyvinyl or a lacquer coating baked on the inside and outside of conduit.
4. Conduit protected solely by enamel, electro-galvanizing, or other processes, etc., will not be acceptable. Conduit shall also conform to the following specifications:
 - a. Federal Specification WW-C-581.
 - b. ANSI Standard C80.1.
 - c. ASTM Standard A 120.
 - d. Underwriters' Laboratories UL 6.
5. Conduit shall be as manufactured by Allied Tube and Conduit Corp., Wheatland Tube Co., Republic Steel Corp. or equal.

D. Conduit outlet bodies shall be cast, Appleton Electric Co. Form 35, Crouse-Hinds Co. Form 8, Killark O Series or equal.

E. Polyvinyl Chloride (PVC). PVC conduit shall be Schedule 40 type, complying with NEMA TC 2 and UL 651. Conduit shall be rated for direct buried or concrete encased applications. Fittings shall be by same manufacturer as conduit and shall comply with NEMA TC 3. Conduit shall be manufactured by Carlon, Cantex, JM Eagle or equal. Exposed PVC conduits shall be sunlight resistant and be provided with expansion fittings.

2.04 OUTLET BOXES

A. Surface mounted outlet boxes shall be cast, type FD for devices or type JB for fixtures or type SEH for junction boxes, etc. All surface mounted boxes shall have threaded bosses or hubs, mounting flanges, and gasketed covers. Cast boxes shall be as manufactured by Crouse-Hinds, Appleton Electric Co., Killark Electric Co., or equal.

2.05 PULL OR JUNCTION BOXES

A. Junction or pull boxes installed indoors shall conform to UL 50 and shall be of code gauge galvanized sheet metal and of sufficient size to accommodate the size conduits and number of wires as required by the NEC. Box covers shall be fastened with stainless steel or brass screws. Junction boxes installed outdoors or in wet areas, as determined by the Engineer, shall be weatherproof, NEMA 4X, stainless steel, fiberglass reinforced polyester or cast, with mounting flanges where surface mounted, and with union and threaded hubs and gasketed covers. Junction boxes shall be not less than 4 inches square by 1-1/2 inches deep. Box extensions for outlets shall be cast metal and for fixtures may be sheet metal. All boxes subject to moisture shall be provided with 1/8-inch thick neoprene gaskets, threaded hubs and mounting lugs. Galvanized sheet steel outlet or switch boxes shall not be used as surface mounted pull or junction boxes and surface mounted pull or junction boxes less than 6 inches square shall be cast.

2.12 PANELBOARDS

A. MANUFACTURERS:

1. Cutler-Hammer Products
2. General Electric Company
3. Siemens Energy and Automation, Inc.
4. Or equal.

B. PANELBOARDS:

1. Single-Phase, 120/240V, 3-wire, factory assembled deadfront type panelboard(s).
2. Furnish panelboard(s) complete with branch circuit breakers and a main circuit breaker as indicated.
3. Furnish panelboard(s) with full capacity separate ground bus, separate insulated neutral bus and furnish panelboards connected to a single phase, 3-wire service as indicated. All buses shall be tinned copper.
4. Provide panelboard(s) with the voltage, frequency and current ratings as indicated conforming to NEMA Standard PB1, Federal Specification W-P-115A. U.L. 67, and the N.E.C.
5. Furnish the panelboard(s) with main and 100% neutral buses, minimum 98 percent conductivity, rectangular copper bars and bolted type lugs.
6. Silver plate copper buses, connectors and terminals to a minimum thickness of 0.005-in., conforming to the requirements of Federal Spec. QQ-S-365B.
7. Prevent terminal lugs from turning per NEMA standard PBI and ensure they are rated for the conductor material and size.
8. Provide main bus-bracing for each panel board adequate for 22,000 amperes symmetrical short circuit at 240 volts.

9. Provide typed panelboard directory cards with the following information:
 - a. Panelboard name designation.
 - b. Panelboard voltage rating.
 - c. Panelboard ampere rating.
 - d. Panelboard short circuit rating.
10. Panelboard pole/circuit numbers and branch circuit description as wired in the field.
11. Indicate 1-Pole, 2 pole and 3 pole branch circuit breakers.
12. Label spare circuit breakers "spare".

C. CIRCUIT BREAKERS:

1. Furnish branch and main circuit breakers. Furnish frame sizes, trip setting and number of poles as indicated. Mark circuit breakers with ampere trip rating. Furnish breakers meeting the requirements of F.S. W-C-375B and NEMA AB1. Branch and main circuit breakers with a short circuit requirement higher than 22 KA symm. shall be current limiting. Provide circuit breakers marked with ampere trip rating that can be read at a distance of two feet from the panel. Provide breakers meeting the requirements of Fed. Spec. W-C-375B and NEMA AB1.
2. Do not use single pole breakers with handle ties or bails in lieu of multipole breakers.
3. Furnish handle lock device on breakers as indicated to prevent the manual opening of the selected breakers.
4. Furnish padlocking device on breakers as indicated to prevent the opening of indicated breakers.
5. Voltage and interrupting rating of all breakers in a panelboard shall not be less than voltage and short circuit rating of the panelboard main buses, as indicated. Series rated circuit breakers are not acceptable.
6. Arc-Fault Circuit Interrupter Circuit Breakers: Comply with UL 1699; 120/240-V, single-pole configuration.
7. Furnish ground fault interrupter circuit breakers for receptacle circuits as indicated.
8. Furnish single pole breakers with full module size. Do not install two pole breakers in a single module.

2.15 GFCI RECEPTACLES

A. Receptacle shall be 20A, 120V, NEMA 5-20R, Heavy Duty GFCI duplex receptacle type. Receptacle shall conform to Federal Specifications WC596-F and UL943. Receptacle manufacturer shall be Eagle, Hubbell, Arrow-Hart, Pass and Seymour, or approved equal.

2.16 GROUND RODS

A. Ground rods shall be copper-clad steel, sectional type; 3/4" diameter by 10 feet long. Ground rod manufacturer shall be Burndy, Cooper/B-Line, Erico, Thomas & Betts, or approved equal.

2.17 UNDERGROUND WARNING TAPE

A. Warning tape shall be permanent, bright-colored, detectable, continuous-printed vinyl tape, not less than 6"-wide by 5 mils thick. Tape shall be compounded for permanent direct-burial service and embedded with a continuous detectable metallic strip or core. Tape shall have a printed legend that indicates type of underground line with color conforming to the latest American Public Works Association (APWA) Uniform Color Code.

B. Tape shall conform to the specifications of OSHA Regulation 1926-956 and the DOT Office of Pipeline Safety USAS B31.8. Manufacturer's data for underground warning tape shall be submitted with conduit submittal.

PART 3 EXECUTION

3.01 GENERAL

A. All equipment, materials, etc., shall be installed in accordance with the requirements of all applicable codes, local ordinances and as shown on the Drawings and/or as herein described or directed by the Engineer.

3.02 EQUIPMENT

A. Switches, devices and similar pieces of equipment, shall be installed at the locations shown on the Drawings. On concrete walls, the equipment shall be attached by means of bolts and expansion shields, and on hollow masonry walls by means of toggle bolts.

B. All equipment shall be installed in a rigid and satisfactory manner, and all incidental materials required for properly mounting equipment shall be furnished and installed to make complete installations satisfactory to the Engineer.

3.03 CONDUIT

- A. Conduits shall be run exposed and/or concealed as indicated on the Drawings. Exposed conduits shall be securely fastened in place on not more than 5-foot centers, and hangers, supports or fastenings shall be provided at each end of straight runs, terminating in a box or cabinet. Horizontal and vertical runs may be supported by one-hole malleable straps, clamp backs, or other approved device with suitable bolts, expansion shields, or beam clamps for mounting to building structure, or special brackets or machine screws on metal surfaces. A touchup compound shall be used on joint sleeves for fusing to conduit coating. A touchup compound shall be used on all exposed threads after the conduit is installed.
- B. Hot dipped galvanized rigid steel conduit shall be used interior to the building. Rigid steel conduit shall be used where run exposed outdoors and transitioning to underground conduit. PVC Schedule 40 conduit shall be used for exterior underground applications, both direct buried and concrete encased.
- C. Conduit shall be installed with runs parallel or perpendicular to walls, structural members, or intersections of vertical planes and ceilings, with right angle bends consisting of cast metal fitting or symmetrical bends. Bends and offsets shall be made with a hickey or power bender without kinking or destroying the smooth bore of the conduit. Parallel runs shall be run straight and true with offsets uniform and symmetrical. Conduits shall be securely fastened in place to sheet metal boxes with two locknuts and bushings. Threadless conduit fittings will not be permitted. Insulating bushings shall be used on all conduits 1-1/4 inches and larger. Minimum size of conduit shall be 3/4-inch. Running threads and threadless couplings will not be permitted. Conduits run exposed shall be provided with 1/4 inch spacers to keep the conduit off wall surfaces.
- D. Provide raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound.

3.04 CABLE

- A. Type XHHW-2 wiring shall be used for all interior and above ground branch circuits and feeder applications. Type RHW-2 wiring shall be used for all exterior underground branch circuit and feeder applications.
- B. No conductors shall be drawn into any conduit until all work which may cause cable damage is completed. Only approved cable lubricants (such as powdered soapstone) shall be used when necessary. As far as practicable, all cable shall be continuous from origin to panel termination without running splices in intermediate pull boxes. Sufficient slack shall be left at the terminations to make proper connections. Branch circuit conductors shall be continuous from outlet to outlet and no splices shall be made except within outlets, junction boxes or pull boxes. Pull boxes shall be utilized where required.
- C. Unless otherwise noted, each conduit raceway shall contain only those conductors constituting a single feeder circuit: where feeders of more than one conductor per phase pass through pull boxes or panels, each conductor of one phase shall be grouped together with conductors of the other two

phases to reduce reactance effect. A green equipment grounding conductor shall be run with each feeder and branch circuit.

- D. All cable terminals, taps and splices shall be made cure with solderless pressure connectors unless otherwise specified. All joints shall be wrapped with self-vulcanizing bare rubber tape and friction or plastic electrical insulating tape. Where conductors are to be connected to metallic surfaces, the coated surfaces of the metal shall be polished before installing connector. Lacquer coating of conduits shall be removed where ground clamps are to be installed.
- E. No wire smaller than No. 12 shall be used. Conductors terminating at wired outlets shall extend at least 8 inches beyond the outlet to facilitate installation of wiring devices or fixtures.
- F. Splices for branch circuits shall be soldered or made with approved pressure or crimp type connectors, such as Ideal Industries nylon insulated wingnut or "Wrap-Cap" insulator or "Scotchlok" brand spring connectors and properly insulated for the system voltage. Wire nuts and similar devices will not be acceptable.

3.06 JUNCTION BOXES

- A. Boxes shall be installed where necessary to facilitate conductor installation. Removable covers shall be accessible at all times. Galvanized steel sheet outlet or switch boxes shall not be used as surface mounted pull or junction boxes unless mounted over 12-feet up and in dry areas and surface mounted pull or junction boxes less than 6-inches square shall be cast.

3.07 HAZARDOUS LOCATIONS

- A. All equipment, fittings and wiring installed in any areas noted as hazardous on the Drawings shall be as approved by the National Electrical Code for Class 1, Division 1, Group D location. Materials shall be of the best quality designed for the type of hazard indicated. At least five full threads shall be engaged on all conduit connections to couplings and fitting hubs. Sealing fitting shall be properly installed at all locations, in accordance with Code regulations.

3.08 PANELBOARDS

A. INSTALLATION:

1. Mount panelboards such that the height of the top operating handle does not exceed 6 ft. 6-in. from the floor.
2. Hang each door of the cabinet on semi- or fully concealed hinges with a combination catch and lock.
3. On cabinets 48 in. high and over, install a 3-point catch assembly latching at top, bottom and approximate middle.

3.09 GROUNDING

- A. The conduit systems and neutral conductors of all wiring systems shall be grounded.

- B. Grounding shall be provided for conduits and electrical equipment in accordance with the requirements of the National and State Electrical Codes. Where grounding conductors are to be connected to metallic surfaces, the coated surfaces of the metal shall be polished before installing connector. Lacquer coating of conduits shall be removed where ground clamps are to be installed.
- B. Noncurrent carrying metal parts of electrical equipment shall be effectively bonded together and grounded permanently. The size of the system or equipment grounding conductor shall be not less than the sizes given in the National Electrical Code. In no case, shall the equipment grounding conductor be a system neutral or current carrying conductor. A separate green colored ground wire shall be carried with building feeders and branch circuits for equipment grounding. The equipment ground shall be bonded together and to conduits, racks, etc.

3.10 REPAIR OF EXISTING WORK

- A. The work shall be carefully laid out in advance. Where cutting, channeling, chasing or drilling of floors, walls, partitions, ceilings or other surfaces is necessary for the proper installation, support of anchorage of the conduit, raceways or other electrical work, this work shall be carefully done, and any damage to the building, piping or equipment shall be repaired by skilled mechanics of the trades involved at no additional cost to the Owner.

3.11 TESTS

- A. After the complete electrical system or systems installation is completed, and at such times as the Engineer may direct, the Contractor shall conduct operating tests for approval. All electrical equipment shall be demonstrated to operate in accordance with the requirements of this and other Sections of the Specifications.
- B. Ground System Tests and Inspections:
 - a. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
 - b. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
 - c. Test completed grounding system at each location.
 - i. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - d. Grounding system will be considered defective if it does not pass tests and inspections.
 - e. Prepare test and inspection reports.

** END OF SECTION **