TOWN OF WAREHAM
OFFICE OF THE TOWN ADMINISTRATOR
AIR CONDITIONING PROJECT
PROJECT FOR WAREHAM TOWN HALL

WAREHAM
Massachusetts

PROJECT MANUAL:

Wareham Town Hall Air Conditioning Project
INVITATION FOR BID

Pre-Bid Meeting: Tuesday, August 3, 2021 at 10:00 a.m.
Filed Sub-Bid Opening Date: Thursday, August 12, 2021 at 2:00 p.m.
General Bid Opening Date: Thursday, August 26, 2021 at 2:00 p.m.

Plans and Specifications
Prepared by:

c.a.crowley. ENGINEERING, INC.
645 County Street, Unit 6
Taunton, MA 02780
Contact: Marty Vickey

July 28, 2021
Derek Sullivan, Town Administrator

TOWN OF WAREHAM

PROJECT MANUAL TABLE OF CONTENTS

Wareham Town Hall Air Conditioning Project

PLANS MAY BE OBTAINED AT THE OFFICE OF THE TOWN ADMINISTRATOR. PLEASE CALL AHEAD FOR AVAILABILITY AT 508-291-3100 Ext. 3110.

END OF SECTION

TOWN OF WAREHAM

OFFICE OF THE TOWN ADMINISTRATOR

INVITATION FOR BID

The Town of Wareham invites sealed bids in accordance with M.G.L. c.149 from Contractors for:

Wareham Town Hall Air Conditioning Project

Pre-bid Meeting at: **10:00 a.m., Tuesday, August 3, 2021, located at Wareham Town Hall, 54 Marion Rd, Wareham, MA 02571**

Filed Sub-Bids will be received until **2:00 p.m., Thursday, August 12, 2021**

General Bids will be received until **2:00 p.m., Thursday, August 26, 2021**

at the Office of the Town Administrator, Wareham Town Hall, 54 Marion Road, Wareham, MA 02571. Bids will not be accepted nor may submitted bids be corrected, modified or withdrawn after the deadline for bids. Following the deadline for bids, all bids received within the time specified will be publicly opened and read aloud.

Contract Documents will be available online at the Town's website: **www.wareham.ma.us** after: **12:00 p.m., July 28, 2021.** Bidders are responsible for downloading the specifications from the Town's web site at **www.wareham.ma.us**. Bidders are requested to email the Office of the Town Administrator dmenard@wareham.ma.us their Company Name, Address, Email address, Phone & Facsimile number and what project they have downloaded (Wareham Town Hall Air Conditioning Project).

All General Bids must be accompanied by a copy of a "Certificate of Eligibility" (DCAMM Form CQ-7) issued by the Department of Capital Asset Management and Maintenance (DCAMM) and a "Contractor Update Statement" (DCAMM Form CQ-3). The category of work for which the Bidder must be certified**: Heating, Ventilating and Air Conditioning (HVAC)**

All bids must be accompanied by a bid deposit in an amount that is not less than five percent (5%) of the value of the bid, including all add alternates. Bid deposits, payable to the Town of Wareham, shall be either in the form of a bid bond, or cash, or a certified check on, or a treasurer's or cashier's check issued by, a responsible bank or trust company. Bidders are reminded that the bid deposit covers the Town for damages when a bidder withdraws its bid after the bid submisssion date. **Be advised that to the extent permitted by the law the Town will retain all bid deposits for withdrawn bids.**

All bids shall be submitted as one ORIGINAL and two COPIES.

All bids are subject to the provisions of M.G.L. Chapter 149, Section 44 A-J. **Wages are subject** to minimum wage rates determined by the Massachusetts Department of Labor Standards pursuant to M.G.L. Chapter 149, Sec. 26 to 27H. The schedule of wage rates applicable to this contract is included in the bidding documents. In addtion, the prevailing wage schedule will be updated annually for all public construction projects lasting longer than one (1) year or at each renewal, as applicable. You will be required to pay the rates set out in any updated prevailing wage schedule. Increases in prevailing wage schedules will not be the basis for change order requests. The successful bidder will be required to provide a Certificate of Insurance demonstrating current coverage of the type and amounts set forth in the Project Manual. The successful bidder will be required to furnish a **Labor and Materials Payment Bond** and a **Performance Bond**, each in the amount of 100% of the contract total.

The costs of any bond and any insurance required in this Invitation For Bid are the responsibility of the bidder; such costs will not be reimbursed by Town and should be included in your bid.

All Town of Wareham bids are available on the Town's web site, www.wareham.ma.us Invitation for Bid. It is the sole responsibility of the contractor downloading these bids to ensure they have received any and all addenda prior to the bid opening. Addenda will be available online within the original bid document as well as a separate file. If you download bids from the town website and would like to make it known that your company has done so, you must fax the Office of the Town Administrator 508-885-7500 Ext. 155 or email dmenard@wareham.ma.us with your NAME, ADDRESS, PHONE, FAX AND INVITATION FOR BID PROJECT: WAREHAM TOWN HALL AIR CONDITIONING PROJECT.

The Town will reject any and all bids in accordance with the above referenced General Laws. In addition, the Town reserves the right to waive minor informalities in any or all bids, or to reject any or all bids (in whole or in part) if it be in the public interest to do so.

In the event that any person wishes to attend a bid opening or pre-bid meeting, accessible and reasonable accommodations will be provided to persons requiring assistance. If you need a reasonable accommodation, please contact the Town of Wareham's ADA Coordinator, Theodore Misiaszek, at least two business days in advance of the meeting: 508-291-3100.

END OF INVITATION TO BID

TOWN OF WAREHAM

OFFICE OF THE TOWN ADMINISTRATOR

INSTRUCTIONS TO BIDDERS

ARTICLE 1 - BIDDER'S REPRESENTATION

1.1 Each General Bidder (hereinafter called the "Bidder") by making a bid (hereinafter called "bid") represents that:

1. The Bidder has read and understands the Contract Documents and the bid is made in accordance therewith.

2. The Bidder has visited the site and is familiar with the local conditions under which the Work has to be performed.

1.2 Failure to so examine the Contract Documents and site will not relieve any Bidder from any obligation under the bid as submitted.

ARTICLE 2 - REQUEST FOR INTERPRETATION

2.1 Bidders shall promptly notify the Town of any ambiguity, inconsistency, or error which they may discover upon examination of the Contract Documents, the site, and local conditions.

2.2 Bidders requiring clarification or interpretation of the Contract Documents shall make a written request to the *Town Administrator*, at dmenard@wareham.ma.us or via facsimile (508) 295-5300. The Town will answer such requests if received by **Monday, August 9, 2021 at 12:00 pm.**

2.3 Interpretation, correction, or change in the Contract Documents will be made by Addendum which will become part of the Contract Documents. The Town will not be held accountable for any oral instruction.

2.4 Addenda will be emailed to every individual or firm on record as having taken a set of Contract Documents.

2.5 Copies of addenda will be made available for inspection at the location listed in the Invitation for Bids where Contract Documents are on file, in addition to being available online at **www.wareham.ma.us**.

2.6 Bidders or proposers contacting ANY TOWN EMPLOYEE regarding an Invitation for Bid (IFB) or a Request for Proposal (RFP), outside of the Office of the Town Administrator, once an IFB or RFP has been released, may be disqualified from the bidding process.

2.7 Bidders downloading information off the internet web site are solely responsible for obtaining any addenda prior to the bid opening. If the bidder makes themselves known to the Office of the Town Administrator, at dmenard@wareham.ma.us or via facsimile (508) 295-5300, they shall be placed on the bidder's list. Bidders must provide the Office of the Town Administrator with their company's name, street address, city, state, zip, phone, fax, email address and project name.

~~ARTICLE 3 – MBE PARTICIPATION~~

~~3.1 Notice is hereby given that the Mayor's Affirmative Action Plan for the Town of Wareham, dated December 1999 is applicable to all construction contracts in excess of $10,000.00. A copy of this plan is on file at Town of Wareham Purchasing Department.~~

~~3.2 Notice is hereby given that the Town of Wareham Minority/Women Business Enterprise Plan dated December 1999 and the Supplemental Equal Employment Opportunity Anti-Discrimination and Affirmative Action Program is applicable to all City contracts for goods and services in excess of $50,000.00. Copies of these plans are available on the Purchasing Department's webpage.~~

ARTICLE 4 - PREPARATION AND SUBMISSION OF BIDS

4.1 Bids shall be submitted on the "Bid Form" attached.

4.2 All entries on the Bid Form shall be made by typewriter or in ink.

4.3 Where so indicated on the Bid Form, sums shall be expressed in both words and figures. Where there is a discrepancy between the bid sum expressed in words and the bid sum expressed in figures, the words shall control.

4.4 Bid Deposits shall be submitted in the amount specified in the Invitation for Bids. They shall be made payable to the Town of Wareham and shall be either in the form of cash, certified check, treasurer's or cashier's check issued by a responsible bank or trust company, or a bid bond issued by a surety licensed to do business in the Commonwealth of Massachusetts; and shall be conditioned upon the faithful performance by the principal of the agreements contained in the bid.

Bid deposits of the three (3) lowest responsible and eligible Bidders shall be retained until the execution and delivery of the Owner/Contractor agreement.

4.5 The Bid, including the bid deposit shall be enclosed in a sealed envelope with the following plainly marked on the outside:

* GENERAL BID FOR: **Wareham Town Hall Air Conditioning Project**
* NAME OF PROJECT: **Wareham Town Hall Air Conditioning Project**
* BIDDER'S NAME, BUSINESS ADDRESS, AND PHONE NUMBER

4.6 Date and time for receipt of bids is set forth in the Invitation for Bids.

Timely delivery of a bid at the location designated shall be the full responsibility of the Bidder.

Bids shall be submitted with one **original** and two **copies.**

ARTICLE 5 - ALTERNATES

5.1 Each Bidder shall acknowledge Alternates (if any) in Section C on the Bid Form.

5.2 In the event an Alternate does not involve a change in the amount of the base bid, the Bidder shall so indicated by writing "No Change", or "N/C" or "0" in the space provided for that Alternate.

5.3 Bidders shall enter on the Bid Form a single amount for each Alternate which shall consist of the amount for work performed by the Contractor.

5.4 The low Bidder will be determined on the basis of the sum of the base bid and the accepted alternates.

ARTICLE 6 - WITHDRAWAL OF BIDS

6.1 Any bid may be withdrawn prior to the time designated for receipt of bids on written or telegraphic request. Telegraphic withdrawal of bids must be confirmed over the Bidder's signature by written notice postmarked on or before the date and time set for receipt of bids.

6.2 Withdrawn bids may be resubmitted up to the time designated for the receipt of bids.

6.3 No bids shall be withdrawn within thirty days, Saturdays, Sundays and legal holidays excluded, after the opening of the bids.

ARTICLE 7 - CONTRACT AWARD

7.1 The Town of Wareham will award the contract to the eligible and responsible Bidder that submitted the lowest Proposed Contract Price for labor and materials set forth below on the Bid Form. A contract will be awardeded within thirty days, Saturdays, Sundays, and legal holidays excluded after the opening of bids.

7.2 The Town of Wareham reserves the right to waive any informalities in or to reject any or all Bids if it be in the public interest to do so.

7.3 The Town reserves the right to reject any bidder who has failed to pay any local taxes, fees, assessments, betterments, or any other municipal charge, unless the bidder has a pending abatement application or has entered into a payment agreement with the collector-treasurer.

7.4 As used herein, the term "lowest responsible and eligible Bidder" shall mean the Bidder (1) whose bid is the lowest of those bidders possessing the skill, ability and integrity necessary for the faithful performance of the work; (2) who shall certify that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed in the work; (3) who, where the provisions of section eight B of chapter twenty-nine apply, shall have been determined to be qualified thereunder.

7.5 Subsequent to the award and within five (5) days, Saturday, Sundays and legal holidays excluded, after the prescribed forms are presented for signature, the successful Bidder shall execute and deliver to the Town a Contract in the form included in the Contract Documents in such number of counterparts as the Town may require.

7.6 In the event that the Town receives low bids in identical amount from two or more responsive and responsible Bidders, the Town shall select the successful Bidder by a blind selection process such as flipping a coin or drawing names from a hat. The low Bidders who are under consideration will be invited to attend and observe the selection process.

ARTICLE 8 - TAXES

8.1 The Bidder shall not include in this bid any tax imposed upon the sale or rental of tangible personal property in this Commonwealth, such as any and all building materials, supplies, services and equipment required to complete the work.

8.2 The Town is exempt from payment of the Massachusetts Sales Tax, and the Bidder shall not include any sales tax on its bid. The Town's exemption Number will be provided to the awarded bidder.

ARTICLE 9 – PROPRIETARY SPECIFICATIONS

9.1 The Town may have used a proprietary specification to describe the supply listed in the specifications. Such specifications are permitted under M.G.L. c. 30, §39M(b), provided that the Town states in writing that use of the proprietary specification is in its best interest and that it will accept an "equal" of the item specified. An item is considered equal if (i) it is at least equal in quality, durability, appearance, strength, and design; (ii) will perform the intended function at least equally; and (iii) conforms substantially, even with deviations, to the detailed requirements contained in the specifications. In the event that the Bidder wishes to substitute an equal item, it may do so either in its bid or proposal or after the contract is awarded but before a contract is executed, it being understood that the award shall be conditioned on the Bidder providing the item originally specified or an equal item accepted by the Town and identified in the contract. In no event shall the Bidder be entitled to offer, or the Town obliged to consider, the substitution of an item as equal after execution of a contract. In the event the Bidder substitutes or attempts to substitute an "equal" item after that date, it shall be in breach thereof and be liable for actual and consequential damages resulting from its failure to perform as agreed. The Town shall have the sole right to determine whether or not said item is equal.

9.2 The required determination and justification have been duly prepared, and a copy may be requested in accordance with the Massachusetts Public Records Law, M.G.L. c. 66, §10.

ARTICLE 10 – ENVIRONMENTALLY PREFERABLE PRODUCTS

10.1 The Town encourages environmentally preferable products, i.e., products or services that have less negative or more positive effects on human health and the environment when compared with competing products or services that serve the same purpose. The Town encourages bidders to describe, in the space provided on the Bid Form, the environmental attributes of its goods or services throughout the entire life-cycle, including manufacture, use and disposition. This information may include multiple environmental considerations such as natural resource use, recycled content, energy and water efficiency, greenhouse gas emissions, impact on climate change, packaging, hazardous material use, and health and safety impacts on workers, consumers and the community. If you do not currently assess such attributes, please indicate that. However you respond, the Town will not take your information into account in evaluating bid proposals.

10.2 Bidders are encouraged also to provide information related to steps they take internally to (a) identify any positive or negative environmental attributes of products or services they offer, as specified above, and (b) insure that those attributes are being addressed as part of operations.

END OF SECTION

TOWN OF WAREHAM

OFFICE OF THE TOWN ADMINISTRATOR

FILED SUB-BID FORM

WAREHAM TOWN HALL AIR CONDITIONING PROJECT

TO THE AWARDING AUTHORITY:

A. The undersigned proposes to furnish all labor and materials required for the air conditioning project located at the Wareham Town Hall in Wareham, Massachusetts in accordance with the accompanying plans and specifications prepared by the Town of Wareham for the contract price specified below, subject to additions and deductions according to the terms of the specifications.

B. This sub-bid includes addenda number(s) _____, _____, _____, _____, _____

C. The Proposed Contract Price (for labor and materials) is:

_____DOLLARS ($_____)

COMPANY:_____

D. This sub-bid:

May be used by any General Bidder Except:

_____

_____

May only be used by the following General Bidders:

_____

_____

E. The undersigned has completed and submits herewith the following documents:

- ❑ Signed Original Sub-Bid and one COPY, 3 pages
- ❑ Signed DCAMM Filed Sub-bid Update Statement, 1 page
- ❑ Bidder's Qualifications and References Form, 2 pages
- ❑ Certificate of Non-Collusion, 1 page
- ❑ Certificate of Foreign Corporation, 1 page
- ❑ Debarment Letter, 1 page
- ❑ IRS Form W-9, 1 page

F. The undersigned agrees that, if selected as a sub-bidder, he will, within five days, Saturday, Sundays and legal holidays excluded, after presentation of a subcontract by the general bidder selected as the general contractor, execute with such general bidder a subcontract in accordance with the terms of this sub-bid, and contingent upon the execution of the

general contract, and , if requested to do so in the general bid by such general bidder, who shall pay the premiums therefore, or if prequalification is required pursuant to Secxtion 44D 3/4, furnish a performance and payment bond of a surety company qualified to do business under the laws of the Commonwealth and satisfactory to the awarding authority, in the full sum of the subcontract price.

G. The undersigned furhter agrees to be bound to the general contractor by the terms of the herinbefore described palns, specifications, including all general conditions stated therein, and addenda, and to assume toward him all the obligations and responsibilities that he, by those documents, assumes toward the owner.

H. The undersigned hereby certifies that s/he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work and that s/he will comply fully with all laws and regulations applicable to awards made subject to section forty-four A of M.G.L. Chapter 149.

I. The undersigned hereby certifies that he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work; that all employees to be employed at the worksite will have successfully completed a course in construction safety and health approved by the United States Occupational Safety and Health Administration that is at least 10 hours in duration at the time the employee begins work and who shall furnish documentation of successful completion of said course with the first certified payroll report for each employee; and that he will comply fully with all laws and regulations applicable to awards of subcontracts subject to section 44F. ***The safety training requirement in this paragraph is effective July 1, 2006***.

The undersigned further certifies under the penalties of perjury that this sub-bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

Date _____

_____
(Name of Sub-Bidder)

BY:_____
(Signature)

_____
(Printed Name and Title of Signatory)

_____
(Business Address)

_____
(City, State Zip)

_____/_____
(Telephone) (FAX)

_____
E-mail address (optional)

NOTE: If the sub-bidder is a corporation, indicate state of incorporation under signature, and affix corporate seal; if a partnership, give full names and residential addresses of all partners; and if an individual, give residential address if different from business address.

END OF SECTION

*

SPECIAL NOTICE TO AWARDING AUTHORITY
SUB-BIDDERS' UPDATE STATEMENTS ARE NOT PUBLIC RECORDS AND ARE NOT OPEN TO PUBLIC INSPECTION (M.G.L. C.149, §44D)

EFFECTIVE MARCH 30, 2010

Commonwealth of Massachusetts
Division of Capital Asset Management

SUB-BIDDER
UPDATE STATEMENT

TO ALL SUB-BIDDERS, TRADE CONTRACTORS AND AWARDING AUTHORITIES

A COMPLETED AND SIGNED SUB-BIDDER UPDATE STATEMENT MUST BE SUBMITTED WITH EVERY FILED SUB-BID PURSUANT TO M.G.L. c.149, §44F AND EVERY TRADE SUB-BID PURSUANT TO M.G.L. c. 149A. ANY FILED SUB-BID OR TRADE SUB-BID SUBMITTED WITHOUT AN APPROPRIATE SUB-BIDDER UPDATE STATEMENT IS INVALID AND MUST BE REJECTED.

Caution: This form is to be used for submitting Filed Sub-Bids and Trade Sub-Bids. It is not to be used for submitting Prime/General Contract bids.

AWARDING AUTHORITIES

If the Awarding Authority determines that the sub-bidder is not competent to perform the work as specified on the project, it should reject the bid.

SUB-BIDDER'S AFFIDAVIT

I swear under the pains and penalties of perjury that I am duly authorized by the bidder named below to sign and submit this Sub-bidder Update Statement on behalf of the bidder named below, that I have read this Sub-bidder Update Statement, and that all of the information provided by the bidder in this Sub-bidder Update Statement is true, accurate, and complete as of the bid date.

_____
Bid Date

_____
Print Name of Sub-bidder or Trade Contractor

_____
Project Number (or name if no number)

_____
Business Address

_____
Awarding Authority

_____
Telephone Number

SIGNATURE⇨

_____
Bidder's Authorized Representative

TOWN OF WAREHAM

OFFICE OF THE TOWN ADMINISTRATOR

GENERAL BID FORM

WAREHAM TOWN HALL AIR CONDITIONING PROJECT

TO THE AWARDING AUTHORITY:

A. The undersigned proposes to furnish all labor and materials required for the air conditioning project located at the Wareham Town Hall in Wareham, Massachusetts in accordance with the accompanying plans and specifications prepared by the Town of Wareham for the contract price specified below, subject to additions and deductions according to the terms of the specifications.

B. This bid includes addenda number(s) _____, _____, _____, _____, _____

C. The Proposed Contract Price (for labor and materials) is:

_____DOLLARS ($_____)

COMPANY:_____

D. The subdivision of the proposed contract price is as follows: **ITEM 1.** The work of the general contractor, being all work other than that covered by **ITEM 2.**

Total OF ITEM 1 ..... $_____

ITEM 2, Sub-bids as follows:

Sub-trade	Name of Filed Sub-bidder	Sub-bid Amount	Bond Required Yes	No

E. The undersigned has completed and submits herewith the following documents:

- ❑ Signed Original Bid and one COPY, 3 pages
- ❑ DCAMM General Bidder Update Statement, 1 page
- ❑ Bidder's Qualifications and References Form, 2 pages
- ❑ Certificate of Non-Collusion, 1 page
- ❑ Certificate of Foreign Corporation, 1 page
- ❑ Debarment Letter, 1 page
- ❑ IRS Form W-9, 1 page

F. The undersigned agrees that each of the above named sub-bidders will be used for the work indicated at the amount stated, unless a substitution is made. The undersigned further agrees to pay the premiums for the performance and payment bonds furnished by sub-bidders as requested herein and that all of the cost of all such premiums is included in the amount set forth in Item 1 of this bid.

The undersigned agrees that if s/he is selected as general contractor, s/he will promptly confer with the awarding authority on the question of sub-bidders; and that the awarding authority may substitute for any sub-bid listed above a sub-bid filed with the awarding authority by another sub-bidder for the sub-trade against whose standing and ability the undersigned makes no objection; and that the undersigned will use all such finally selected sub-bidders at the amounts named in their respective sub-bids and be in every way as responsible for them and their work as if they had been originally named in this general bid, the total contract price being adjusted to conform thereto.

G. The undersigned agrees that, if s/he is selected as general contractor, s/he will within five days, Saturdays, Sundays and legal holidays excluded, after presentation thereof by the awarding authority, execute a contract in accordance with the terms of this bid and furnish a performance bond and also a labor and materials or payment bond, each of a surety company qualified to do business under the laws of the commonwealth and satisfactory to the awarding authority and each in the sum of the contract price, the premiums for which are to be paid by the general contractor and are included in the contract price.

The undersigned hereby certifies that s/he is able to furnish labor that can work in harmony with all other elements of labor employed or to be employed on the work and that s/he will comply fully with all laws and regulations applicable to awards made subject to section forty-four A of M.G.L. Chapter 149.

The undersigned further certifies under the penalties of perjury that this bid is in all respects bona fide, fair and made without collusion or fraud with any other person. As used in this subsection the word "person" shall mean any natural person, joint venture, partnership, corporation or other business or legal entity. The undersigned further certifies under penalty of perjury that the said undersigned is not presently debarred from doing public construction work in the Commonwealth under the provisions of section twenty-nine F of chapter twenty-nine, or any other applicable debarment provisions of any other chapter of the General Laws or any rule or regulation promulgated thereunder.

Date _____

_____
(Name of General Bidder)

BY:_____
(Signature)

_____
(Printed Name and Title of Signatory)

_____
(Business Address)

_____
(City, State Zip)

_____/_____
(Telephone) (FAX)

_____
E-mail address (optional)

NOTE: If the bidder is a corporation, indicate state of incorporation under signature, and affix corporate seal; if a partnership, give full names and residential addresses of all partners; and if an individual, give residential address if different from business address.

END OF SECTION

SPECIAL NOTICE TO AWARDING AUTHORITY
BIDDERS' UPDATE STATEMENTS ARE NOT PUBLIC RECORDS AND ARE NOT OPEN TO PUBLIC INSPECTION (M.G.L. C.149, §44D)

EFFECTIVE MARCH 30, 2010

Commonwealth of Massachusetts
Division of Capital Asset Management
PRIME/GENERAL CONTRACTOR UPDATE STATEMENT

TO ALL BIDDERS AND AWARDING AUTHORITIES

A COMPLETED AND SIGNED PRIME/GENERAL CONTRACTOR UPDATE STATEMENT MUST BE SUBMITTED WITH EVERY PRIME/GENERAL BID FOR A CONTRACT PURSUANT TO M.G.L. c.149, §44A AND M.G.L. c. 149A. ANY PRIME/GENERAL BID SUBMITTED WITHOUT AN APPROPRIATE UPDATE STATEMENT IS INVALID AND MUST BE REJECTED.

Caution: This form is to be used for submitting Prime/General Contract bids. It is not to be used for submitting Filed Sub-Bids or Trade Sub-Bids.

AWARDING AUTHORITIES

If the Awarding Authority determines that the bidder does not demonstrably possess the skill, ability, and integrity necessary to perform the work on the project, it must reject the bid.

BIDDER'S AFFIDAVIT

I swear under the pains and penalties of perjury that I am duly authorized by the bidder named below to sign and submit this Prime/General Contractor Update Statement on behalf of the bidder named below, that I have read this Prime/General Contractor Update Statement, and that all of the information provided by the bidder in this Prime/General Contractor Update Statement is true, accurate, and complete as of the bid date.

_____ Bid Date

_____ Print Name of Prime/General Contractor

_____ Project Number (or name if no number)

_____ Business Address

_____ Awarding Authority

_____ Telephone Number

SIGNATURE⇨ _____

Bidder's Authorized Representative

TOWN OF WAREHAM

BIDDER'S QUALIFICATIONS AND REFERENCES FORM

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

1. FIRM NAME: _____

2. WHEN ORGANIZED: _____

3 INCORPORATED? _____ YES _____ NO DATE AND STATE OF INCORPORATION: _____

4. IS YOUR BUSINESS A **MBE**? _____YES _____NO **WBE**? _____YES _____NO or **MWBE**? _____YES _____NO

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

_____

_____

_____

_____

_____

* 6. HAVE YOU EVER FAILED TO COMPLETE A CONTRACT AWARDED TO YOU?
_____ YES _____ NO
IF YES, WHERE AND WHY?

_____

_____

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

_____

_____

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

_____

_____

_____

_____

_____

_____

_____

* 9. IN THE SPACES FOLLOWING, PROVIDE INFORMATION REGARDING CONTRACTS COMPLETED BY YOUR FIRM SIMILAR IN NATURE TO THE PROJECT BEING BID. A MINIMUM OF FOUR (4) CONTRACTS SHALL BE LISTED. PUBLICLY BID CONTRACTS ARE PREFERRED, BUT NOT MANDATORY.

PROJECT NAME: _____
OWNER: _____
CITY/STATE: _____

DOLLAR AMOUNT: $ _____ DATE COMPLETED: _____
PUBLICLY BID? _____YES _____ NO
TYPE OF WORK?: _____
CONTACT PERSON: _____ TELEPHONE #: ____)_____
CONTACT PERSON'S RELATION TO PROJECT?: _____
(i.e., contract manager, purchasing agent, etc.)
_____

PROJECT NAME: _____
OWNER: _____
CITY/STATE: _____
DOLLAR AMOUNT: $ _____ DATE COMPLETED: _____
PUBLICLY BID? _____YES _____ NO
TYPE OF WORK?: _____
CONTACT PERSON: _____ TELEPHONE #: (____)_____
CONTACT PERSON'S RELATION TO PROJECT?: _____
(i.e., contract manager, purchasing agent, etc.)
_____

PROJECT NAME: _____
OWNER: _____
CITY/STATE: _____
DOLLAR AMOUNT: $ _____ DATE COMPLETED: _____
PUBLICLY BID? _____YES _____ NO
TYPE OF WORK?: _____
CONTACT PERSON:_____ TELEPHONE #: (____)_____
CONTACT PERSON'S RELATION TO PROJECT?:_____
(i.e., contract manager, purchasing agent, etc.)
_____
PROJECT NAME: _____
OWNER: _____
CITY/STATE: _____
DOLLAR AMOUNT: $ _____ DATE COMPLETED: _____
PUBLICLY BID? _____YES _____ NO
TYPE OF WORK?: _____
CONTACT PERSON: _____ TELEPHONE #:(____)_____
CONTACT PERSON'S RELATION TO PROJECT?: _____
(i.e., contract manager, purchasing agent, etc.)

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

DATE: _____ BIDDER: _____

SIGNATURE: _____

PRINTED NAME: _____ TITLE: _____

END OF SECTION

CERTIFICATE OF NON-COLLUSION

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

_____

(Signature of individual)

_____

Name of Business

CERTIFICATION OF TAX COMPLIANCE

Pursuant to M.G.L. c.62C, §49A and requirements of the Town, the undersigned acting on behalf of the Contractor certifies under the penalties of perjury that the Contractor is in compliance with all laws of the Commonwealth relating to taxes including payment of all local taxes, fees, assessments, betterments and any other local or municipal charges (unless the Contractor has a pending abatement application or has entered into a payment agreement with the entity to which such charges were owed), reporting of employees and contractors, and withholding and remitting child support.*

_____ _____

**Signature of Individual (Mandatory)

*** Contractor's Social Security Number (Voluntary) or Federal Identification Number

Print Name: _____ Date: _____

OR

_____

Company Name
(Corporation, Partnership, LLC, etc.)

By: _____
**Corporate Officer (Mandatory)

Print Name: _____

Date: _____

* The provision in this Certification relating to child support applies only when the Contractor is an individual.

** Approval of a contract or other agreement will not be granted until the Town receives a signed copy of this Certification.

*** Your social security number may be furnished to the Massachusetts Department of Revenue to determine whether you have met tax filing or tax payment obligations. Providers who fail to correct their non-filing or delinquency will not have a contract or other agreement issued, renewed, or extended.

CERTIFICATE OF FOREIGN CORPORATION

The undersigned hereby certifies that it has been duly established, organized, or chartered as a corporation under the laws of:

(Jurisdiction)

The undersigned further certifies that it has complied with the requirements of M.G.L. c. 30, §39L (if applicable) and with the requirements of M.G.L. c. 156D, §15.03 relative to the registration and operation of foreign corporations within the Commonwealth of Massachusetts.

Name of person signing proposal

Signature of person signing proposal

Name of Business (Please Print or Type)

Affix Corporate Seal here

Town of Wareham

Office of the Town Administrator
Derek Sullivan ֍ *Town Administrator*
54 Marion Road,
Wareham, MA 02571
administration@wareham.ma.us

Telephone
(508) 291-3100 Ext. 3110

Town Administrator
Derek Sullivan

Date

Vendor

Re: Debarment Letter for Invitation For Bid Wareham Town Hall Air Conditioning Project

As a potential vendor on the above contract, the Town requires that you provide a debarment/suspension certification indicating that you are in compliance with the below Federal Executive Order. Certification can be done by completing and signing this form.

Debarment:
Federal Executive Order (E.O.) 12549 "Debarment and Suspension" requires that all contractors receiving individual awards, using federal funds, and all sub-recipients certify that the organization and its principals are not debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded by any Federal department or agency from doing business with the Federal Government.

I hereby certify under pains and penalties of perjury that neither I nor any principal(s) of the Company identified below is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency.

_____ (Name)
_____ (Company)
_____ (Address)
_____ (Address)
PHONE _____ FAX _____
EMAIL _____

_____Signature

_____Date

.

If you have questions, please contact Derek Sullivan, Town Administrator at (508) 291-3100 Ext. 3110.

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

► Go to *www.irs.gov/FormW9* for instructions and the latest information.

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

Print or type. See Specific Instructions on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☐ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ► _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ►

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):

Exempt payee code (if any) _____

Exemption from FATCA reporting code (if any) _____

(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.

Requester's name and address (optional)

6 City, state, and ZIP code

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number

☐☐☐ – ☐☐ – ☐☐☐☐

or

Employer identification number

☐☐ – ☐☐☐☐☐☐☐

Part II Certification

Under penalties of perjury, I certify that:

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

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

Sign Here **Signature of U.S. person** ► **Date** ►

General Instructions

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

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9*.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, *later.*

Cat. No. 10231X

Form **W-9** (Rev. 10-2018)

CONTRACT FORMS

The forms are provided for informational purposes only.

The awarded bidder will be required to complete and submit the following documents in order to execute a contract pursuant to this bid.

None of the following forms are required at the time of bid submittal.

OWNER-CONTRACTOR CONTRACT

CONTRACT NO. C _____

THIS AGREEMENT made this ___ day of _____ in the year Two Thousand and Twenty One by and between the TOWN OF WAREHAM, a municipal corporation organized and existing under the laws of the Commonwealth of Massachusetts, hereinafter referred to as the TOWN, acting through its Town Administrator, but without personal liability to him, and

_____

hereinafter referred to as the CONTRACTOR.

WITNESSETH, that the parties hereto for the consideration hereinafter set forth agree as follows:

ARTICLE 1. **STATEMENT OF WORK.** The Contractor shall furnish all labor, materials, equipment and insurance, and perform all work required in strict accordance with the Project Manual entitled:

Wareham Town Hall Air Conditioning Project

hereinafter referred to as the SPECIFICATIONS, and the Addenda thereto numbered _____,and all the Drawings referred to therein.

The said Specifications, Addenda and Drawings are incorporated herein by reference and are made a part hereof.

ARTICLE 2. **TIME OF COMPLETION.** The Contractor shall commence work under this Contract on the date specified in the written notice of the Town to proceed and shall fully complete all work hereunder within the time stated elsewhere in the contract documents.

ARTICLE 3. **THE CONTRACT PRICE.** The Town shall pay the Contractor pursuant to and in accordance with the provisions set forth in the Contract Documents, subject to additions and deductions in accordance with the terms of the Specifications, for the full and satisfactory performance of **the Contract the sum of**:

ARTICLE 4. **CONTRACT DOCUMENTS.** The Contract shall consist of the following component parts, copies of which are attached hereto:

a. The Town's Invitation For Bid issued by its Office of the Town Administrator;

b. Project Manual for **WAREHAM TOWN HALL AIR CONDITIONING PROJECT**

c Addenda Numbers _____ to the above referenced Project Manual and/or Plans;

d. The bid of _____ dated _____ and signed by _____ _____, including the Bid Form and Bidder's Qualifications Form and References;

e. Attestation/Certification

This Contract Form, together with the other documents enumerated in this Article 4 form the Contract.

ARTICLE 5. **ALTERNATES.** The following Alternates have been accepted and their costs are included in the Contract Price stated in Article 3 of this Agreement:

Alternates: _____.

ARTICLE 6. **APPLICABLE STATUTES.** All applicable federal, state and local laws and regulations are incorporated herein by reference and the Contractor agrees to comply with same.

IN WITNESS WHEREOF, the parties have caused this instrument to be executed under seal the day and year first above written.

CONTRACTOR

By _____

Print Name_____

Title _____

Date_____

Affix Corporate Seal Here

TOWN OF WAREHAM

By _____
Town Administrator

Date_____

By_____
Commissioner of Public Buildings

Date_____

Certified that Town funds are available in the following account number:

_____

I further certify that the Town Administrator, or his designee, is authorized to execute contracts and approve change orders.

By_____
Comptroller of Accounts

Date _____

Approved as to Legal Form and Character

By_____
Associate Town Solicitor

Date_____

CONTRACT AND BONDS APPROVED

By_____
Town Administrator or his designee

Date_____

FORM OF SUBCONTRACT

THIS AGREEMENT MADE THIS DAY OF_____,20_____ by and between _____ a corporation organized and existing under the laws of _____ an individual doing business as _____ hereinafter called the "Contractor" and _____ a corporation organized and existing under the laws of _____ an individual doing business as _____ hereinafter called the "Subcontractor".

1. The subcontractor agrees to furnish all labor and materials required for the completion of all work specified in Section No. _____ of the specifications for _____ and the plans referred to therein and

Addenda No. _____,_____,_____,_____,_____,_____,_____, and_____ for the:

_____

_____

_____

_____

All as prepared by **C.A. Crowley Engineering, Inc.** for the sum of _____ [$_____]

(a) The Subcontractor agrees to be bound to the Contractor by the terms of the hereinbefore described plans; specifications **(including all general conditions stated therein)** and Addenda No(s). _____,_____,_____,_____,_____, and to assume to the Contractor all obligations and responsibilities that the Contractor by those documents assumes to the Town of Wareham hereinafter called the "Awarding Authority", except to the extent that provisions contained therein are by their terms or by law applicable only to the Contractor.

(b) The contractor agrees to be bound to the Subcontractor by the terms of the hereinbefore described documents and to assume to the Subcontractor all the obligations and responsibilities that the Awarding Authority by the terms of the hereinbefore described documents assumes to the Contractor, except to the extent that provisions contained therein are by their terms or by law applicable only to the Awarding Authority.

2. The Contractor agrees to begin, prosecute and complete the entire work specified by the Awarding Authority in an orderly manner so that the Subcontractor will be able to begin, prosecute and complete the work described in this subcontract; and, in consideration thereof, upon notice from the Contractor, either oral or in writing, the Subcontractor agrees to begin, prosecute and complete the work described in this Subcontract in an orderly manner and with due consideration to the date or time specified by the Awarding Authority for the completion of the entire work.

3. The Subcontractor agrees to furnish to the Contractor within a reasonable time after the execution of this subcontract, evidence of workmen's compensation insurance as required by law and evidence of public liability and property damage insurance of the type and in limits required to be furnished to the Awarding Authority by the Contractor.

4. The Contractor agrees that no claim for services rendered or materials furnished by the Contractor to the Subcontractor shall be valid unless written notice thereof is given by the Contractor to the Subcontractor during the first ten (10) days of the calendar month following that in which the claim originated.

5. This agreement is contingent upon the execution of a general contract between the Contractor and the Awarding Authority for the complete work.

IN WITNESS WHEREOF, the parties hereto have executed this agreement the date and year first above-written.

SEAL

Attest: _____ _____

Name of Subcontractor

By:_____

Signature

SEAL

Attest: _____ _____

Name of Contractor

By:_____

Signature

CERTIFICATE OF AUTHORITY - CORPORATE

I hereby certify that I am the Clerk/Secretary of _____

(insert full name of Corporation)

2. corporation, and that _____
(insert the name of officer who signed the **contract and bonds**.)

3. is the duly elected_____
(insert the title of the officer in line 2)

4. of said corporation, and that on _____
(insert a date that is ***ON OR BEFORE*** the date the officer signed the **contract and bonds**.)

at a duly authorized meeting of the Board of Directors of said corporation, at which all the directors were present or waived notice, it was voted that

5. _____ the _____
(insert **name** from line 2) (insert **title** from line 3)

of this corporation be and hereby is authorized to execute contracts and bonds in the name and on behalf of said corporation, and affix its Corporate Seal thereto, and such execution of any contract of obligation in this corporation's name and on its behalf, with or without the Corporate Seal, shall be valid and binding upon this corporation; and that the above vote has not been amended or rescinded and remains in full force and effect as of the date set forth below.

6. ATTEST: _____ *AFFIX CORPORATE*
(Signature of **Clerk or Secretary**) * *SEAL HERE*

7. Name: _____
(Please print or type name in line 6)*

8. Date: _____
(insert a date that is ***ON OR AFTER*** the date the officer signed the **contract and bonds**.)

* The name and signature inserted in lines 6 & 7 **must** be that of the **Clerk or Secretary** of the corporation.

TOWN OF WAREHAM, MASSACHUSETTS

PERFORMANCE BOND

Know All Men By These Presents:

That we, _____, as PRINCIPAL, and _____ _____, as SURETY, are held and firmly bound unto the Town of Wareham as Obligee, in the sum of dollars **($_____)** to be paid to the Obligee, for which payments well and truly to be made, we bind ourselves, our respective heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Whereas, the said PRINCIPAL has made a contract with the Obligee, bearing the date of _____ _, 2021 for the construction of _____ in Wareham, Massachusetts. (Project Title)

Now, the condition of this obligation is such that if the PRINCIPAL and all Sub-contractors under said contract shall well and truly keep and perform all the undertakings, covenants, agreements, terms and conditions of said contract on its part to be kept and performed during the original term of said contract and any extensions thereof that may be granted by the Obligee, with or without notice to the SURETY, and during the life and any guarantee required under the contract, and shall also well and truly keep and perform all the undertakings, covenants, agreements, terms and conditions of any and all duly authorized modifications, alterations, changes or additions to said contract that may hereafter be made, notice to the SURETY of such modifications, alterations, changes or additions being hereby waived, then this obligation shall become null and void; otherwise, it shall remain in full force, virtue and effect.

In the event, that the contract is abandoned by the PRINCIPAL, or in the event that the Obligee terminates the employment of the PRINCIPAL or the authority of the PRINCIPAL to continue the work said SURETY hereby further agrees that said SURETY shall, if requested in writing by the Obligee, take such action as is necessary to complete said contract.

In Witness Whereof, the PRINCIPAL and SURETY have hereto set their hands and seals this ___day of _____ 2021.

PRINCIPAL	SURETY
_____	_____
BY_____	BY _____
(SEAL)	(ATTORNEY-IN-FACT) (SEAL)
_____ (Title)	
ATTEST: _____	ATTEST: _____

TOWN OF WAREHAM, MASSACHUSETTS

PAYMENT BOND

Know All Men By These Presents:

That we, _____, as PRINCIPAL, and _____ _____, as SURETY, are held and firmly bound unto the Town of Wareham as Obligee, in the sum of dollars **($_____)** to be paid to the Obligee, for which payments well and truly to be made, we bind ourselves, our respective heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

Whereas, the said PRINCIPAL has made a contract with the Obligee, bearing the date of _____ _, 2021, for the construction of _____ in Wareham, Massachusetts. (Project Title)

Now, the conditions of this obligation are such that if the PRINCIPAL and all Sub-contractors under said contract shall pay for all labor performed or furnished and for all materials used or employed in said contract and in any and all duly authorized modifications, alterations, extensions of time, changes or additions to said contract that may hereafter be made, notice to the SURETY of such modifications, alterations, extensions of time, changes or additions being hereby waived, the foregoing to include any other purposes or items set out in, and to be subject to, provisions of M.G.L. c.30, §39A, and M.G.L. c.149, §29, as amended, then this obligation shall become null and void; otherwise it shall remain in full force, virtue and effect.

In Witness Whereof, the PRINCIPAL and SURETY have hereto set their hands and seals this ___day of____ 2021.

PRINCIPAL	SURETY
_____ _____	_____ _____
BY_____ _____	BY _____ _____
(SEAL)	(ATTORNEY-IN-FACT) (SEAL)
_____ (Title)	
ATTEST: _____	ATTEST: _____

TOWN OF WAREHAM

WAGE RATE REQUIREMENTS

1. GENERAL

A. This section summarizes the requirements for the payment of wages to laborers and mechanics employed under the Contract.

B. Other duties and requirements of law which may not be specified in this section apply and are inherently a part of the Contract.

2. WAGE RATES

A. The rate per hour to be paid to mechanics, apprentices, teamsters, chauffeurs, and laborers employed on the Work shall not be less than the rate of wages in the attached "Minimum Wage Rates" as determined by the Commissioner of Labor and Industries. This schedule shall continue to be the minimum rate of wages for said employees during the life of this Contract.

B. Keep posted on the site a legible copy of said schedule. Keep on file the wage rates and classifications of labor employed on this Work in order that they may be available for inspection by the Owner, Administrator, or the Architect.

C. Apprentices employed pursuant to this determination of wage rates must be registered and approved by the State Apprenticeship Council wherever rates for journeymen or apprentices are not listed.

D. Pay reserve police officers employed on the Work the prevailing rate of wages paid to regular police officers as required by M.G.L. c149, Sec. 34B, as amended. Such police officers shall be covered by Workmen's Compensation Insurance and Employers Liability Insurance by the Contractor.

E. **The Contractor and all subcontractors shall, on a weekly basis throughout the term of the contract, provide to the Town of Wareham certified payroll affidavits in pdf format verifying compliance with M.G.L. c.149, Sec. 27, 27A and 27B.** The Contractor is obligated to provide such records to the Town directly on a weekly basis. The Town may assess a penalty of $100 for each day beyond the required submission date that such records are received, which amount shall be deducted from any amounts to the Contractor from the Town. In the event of chronic late submissions, the Town shall report the same to the Office of the Attorney General.

F. The Contractor and all subcontractors shall provide a Statement of Compliance within 15 days of the completion of its portion of the work. This statement shall be submitted to the Owner on the form found elsewhere in this section.

G. The Contractor shall maintain accurate and complete records, including payroll records, during the Contract term and for three years thereafter.

END OF SECTION

CHARLES D. BAKER
Governor

KARYN E. POLITO
Lt. Governor

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

Prevailing Wage Rates

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

ROSALIN ACOSTA
Secretary
MICHAEL FLANAGAN
Director

Awarding Authority: Town of Wareham

Contract Number:

City/Town: WAREHAM

Description of Work: New VRF AC system to serve the first, second and third floor offices. New packaged Rooftop Units to serve the auditorium. Select demolition of the existing auditorium system.

Job Location: 54 Marion Road, Wareham, MA 02571

Information about Prevailing Wage Schedules for Awarding Authorities and Contractors

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
Construction						
(2 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2021	$35.95	$12.91	$14.82	$0.00	$63.68
	08/01/2021	$35.95	$13.41	$14.82	$0.00	$64.18
	12/01/2021	$35.95	$13.41	$16.01	$0.00	$65.37
(3 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2021	$36.02	$12.91	$14.82	$0.00	$63.75
	08/01/2021	$36.02	$13.41	$14.82	$0.00	$64.25
	12/01/2021	$36.02	$13.41	$16.01	$0.00	$65.44
(4 & 5 AXLE) DRIVER - EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2021	$36.14	$12.91	$14.82	$0.00	$63.87
	08/01/2021	$36.14	$13.41	$14.82	$0.00	$64.37
	12/01/2021	$36.14	$13.41	$16.01	$0.00	$65.56
ADS/SUBMERSIBLE PILOT *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$103.05	$9.40	$23.12	$0.00	$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
AIR TRACK OPERATOR *LABORERS - ZONE 2*	06/01/2021	$35.75	$8.60	$16.64	$0.00	$60.99
	12/01/2021	$36.66	$8.60	$16.64	$0.00	$61.90
	06/01/2022	$37.56	$8.60	$16.64	$0.00	$62.80
	12/01/2022	$38.41	$8.60	$16.64	$0.00	$63.65
	06/01/2023	$39.31	$8.60	$16.64	$0.00	$64.55
	12/01/2023	$40.21	$8.60	$16.64	$0.00	$65.45
For apprentice rates see "Apprentice- LABORER"						
AIR TRACK OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.75	$8.60	$16.64	$0.00	$60.99
	12/01/2021	$36.66	$8.60	$16.64	$0.00	$61.90
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASBESTOS WORKER (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (SOUTHERN MASS)*	12/01/2020	$38.10	$12.80	$9.45	$0.00	$60.35
ASPHALT RAKER *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
ASPHALT RAKER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
ASPHALT/CONCRETE/CRUSHER PLANT-ON SITE *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.73	$13.75	$15.80	$0.00	$80.28
	12/01/2021	$51.88	$13.75	$15.80	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BACKHOE/FRONT-END LOADER *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.73	$13.75	$15.80	$0.00	$80.28
	12/01/2021	$51.88	$13.75	$15.80	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
BARCO-TYPE JUMPING TAMPER *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER *LABORERS - ZONE 2*	06/01/2021	$35.75	$8.60	$16.64	$0.00	$60.99
	12/01/2021	$36.66	$8.60	$16.64	$0.00	$61.90
	06/01/2022	$37.56	$8.60	$16.64	$0.00	$62.80
	12/01/2022	$38.41	$8.60	$16.64	$0.00	$63.65
	06/01/2023	$39.31	$8.60	$16.64	$0.00	$64.55
	12/01/2023	$40.21	$8.60	$16.64	$0.00	$65.45
For apprentice rates see "Apprentice- LABORER"						
BLOCK PAVER, RAMMER / CURB SETTER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.75	$8.60	$16.64	$0.00	$60.99
	12/01/2021	$36.66	$8.60	$16.64	$0.00	$61.90
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
BOILER MAKER *BOILERMAKERS LOCAL 29*	01/01/2020	$46.10	$7.07	$17.98	$0.00	$71.15

Apprentice - *BOILERMAKER - Local 29*

Effective Date - 01/01/2020

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

Notes:

Apprentice to Journeyworker Ratio:1:4

BRICK/STONE/ARTIFICIAL MASONRY (INCL. MASONRY WATERPROOFING) *BRICKLAYERS LOCAL 3 (NEW BEDFORD)*	02/01/2021	$55.75	$11.39	$22.09	$0.00	$89.23
	08/01/2021	$57.15	$11.39	$22.25	$0.00	$90.79
	02/01/2022	$57.74	$11.39	$22.25	$0.00	$91.38

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *BRICK/PLASTER/CEMENT MASON - Local 3 New Bedford*

Effective Date - 02/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.88	$11.39	$22.09	$0.00	$61.36
2	60	$33.45	$11.39	$22.09	$0.00	$66.93
3	70	$39.03	$11.39	$22.09	$0.00	$72.51
4	80	$44.60	$11.39	$22.09	$0.00	$78.08
5	90	$50.18	$11.39	$22.09	$0.00	$83.66

Effective Date - 08/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$28.58	$11.39	$22.25	$0.00	$62.22
2	60	$34.29	$11.39	$22.25	$0.00	$67.93
3	70	$40.01	$11.39	$22.25	$0.00	$73.65
4	80	$45.72	$11.39	$22.25	$0.00	$79.36
5	90	$51.44	$11.39	$22.25	$0.00	$85.08

Notes:

Apprentice to Journeyworker Ratio:1:5

BULLDOZER/GRADER/SCRAPER *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
CAISSON & UNDERPINNING BOTTOM MAN *LABORERS - FOUNDATION AND MARINE*	06/01/2021	$41.82	$8.60	$17.72	$0.00	$68.14
	12/01/2021	$42.83	$8.60	$17.72	$0.00	$69.15
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING LABORER *LABORERS - FOUNDATION AND MARINE*	06/01/2021	$40.67	$8.60	$17.72	$0.00	$66.99
	12/01/2021	$41.68	$8.60	$17.72	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
CAISSON & UNDERPINNING TOP MAN *LABORERS - FOUNDATION AND MARINE*	06/01/2021	$40.67	$8.60	$17.72	$0.00	$66.99
	12/01/2021	$41.68	$8.60	$17.72	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
CARBIDE CORE DRILL OPERATOR *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
CARPENTER *CARPENTERS -ZONE 2 (Eastern Massachusetts)*	03/01/2021	$43.54	$9.40	$18.95	$0.00	$71.89
	09/01/2021	$44.19	$9.40	$18.95	$0.00	$72.54
	03/01/2022	$44.79	$9.40	$18.95	$0.00	$73.14
	09/01/2022	$45.44	$9.40	$18.95	$0.00	$73.79
	03/01/2023	$46.04	$9.40	$18.95	$0.00	$74.39

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CARPENTER - Zone 2 Eastern MA*

Effective Date - 03/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.77	$9.40	$1.73	$0.00	$32.90
2	60	$26.12	$9.40	$1.73	$0.00	$37.25
3	70	$30.48	$9.40	$13.76	$0.00	$53.64
4	75	$32.66	$9.40	$13.76	$0.00	$55.82
5	80	$34.83	$9.40	$15.49	$0.00	$59.72
6	80	$34.83	$9.40	$15.49	$0.00	$59.72
7	90	$39.19	$9.40	$17.22	$0.00	$65.81
8	90	$39.19	$9.40	$17.22	$0.00	$65.81

Effective Date - 09/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$22.10	$9.40	$1.73	$0.00	$33.23
2	60	$26.51	$9.40	$1.73	$0.00	$37.64
3	70	$30.93	$9.40	$13.76	$0.00	$54.09
4	75	$33.14	$9.40	$13.76	$0.00	$56.30
5	80	$35.35	$9.40	$15.49	$0.00	$60.24
6	80	$35.35	$9.40	$15.49	$0.00	$60.24
7	90	$39.77	$9.40	$17.22	$0.00	$66.39
8	90	$39.77	$9.40	$17.22	$0.00	$66.39

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 $30.72/ 3&4 $36.75/ 5&6 $55.37/ 7&8 $61.45

Apprentice to Journeyworker Ratio:1:5

CARPENTER WOOD FRAME *CARPENTERS-ZONE 3 (Wood Frame)*	04/01/2021	$23.16	$7.21	$4.80	$0.00	$35.17
	04/01/2022	$23.66	$7.21	$4.80	$0.00	$35.67
	04/01/2023	$24.16	$7.21	$4.80	$0.00	$36.17

All Aspects of New Wood Frame Work

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *CARPENTER (Wood Frame) - Zone 3*

Effective Date - 04/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$13.90	$7.21	$0.00	$0.00	$21.11
2	60	$13.90	$7.21	$0.00	$0.00	$21.11
3	65	$15.05	$7.21	$0.00	$0.00	$22.26
4	70	$16.21	$7.21	$0.00	$0.00	$23.42
5	75	$17.37	$7.21	$3.80	$0.00	$28.38
6	80	$18.53	$7.21	$3.80	$0.00	$29.54
7	85	$19.69	$7.21	$3.80	$0.00	$30.70
8	90	$20.84	$7.21	$3.80	$0.00	$31.85

Effective Date - 04/01/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$14.20	$7.21	$0.00	$0.00	$21.41
2	60	$14.20	$7.21	$0.00	$0.00	$21.41
3	65	$15.38	$7.21	$0.00	$0.00	$22.59
4	70	$16.56	$7.21	$0.00	$0.00	$23.77
5	75	$17.75	$7.21	$3.80	$0.00	$28.76
6	80	$18.93	$7.21	$3.80	$0.00	$29.94
7	85	$20.11	$7.21	$3.80	$0.00	$31.12
8	90	$21.29	$7.21	$3.80	$0.00	$32.30

Notes:

% Indentured After 10/1/17; 45/45/55/55/70/70/80/80
Step 1&2 $17.63/ 3&4 $19.95/ 5&6 $27.22/ 7&8 $29.54

Apprentice to Journeyworker Ratio:1:5

CEMENT MASONRY/PLASTERING *BRICKLAYERS LOCAL 3 (NEW BEDFORD)*	01/01/2020	$49.07	$12.75	$22.41	$0.62	$84.85

Apprentice - *CEMENT MASONRY/PLASTERING - Eastern Mass (New Bedford)*

Effective Date - 01/01/2020

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

Notes:

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

Apprentice to Journeyworker Ratio:1:3

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
CHAIN SAW OPERATOR *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
CLAM SHELLS/SLURRY BUCKETS/HEADING MACHINES *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$51.73	$13.75	$15.80	$0.00	$81.28
	12/01/2021	$52.88	$13.75	$15.80	$0.00	$82.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
COMPRESSOR OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$33.40	$13.75	$15.80	$0.00	$62.95
	12/01/2021	$34.19	$13.75	$15.80	$0.00	$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DELEADER (BRIDGE) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2021	$52.06	$8.25	$22.75	$0.00	$83.06

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.03	$8.25	$0.00	$0.00	$34.28
2	55	$28.63	$8.25	$6.16	$0.00	$43.04
3	60	$31.24	$8.25	$6.72	$0.00	$46.21
4	65	$33.84	$8.25	$7.28	$0.00	$49.37
5	70	$36.44	$8.25	$19.39	$0.00	$64.08
6	75	$39.05	$8.25	$19.95	$0.00	$67.25
7	80	$41.65	$8.25	$20.51	$0.00	$70.41
8	90	$46.85	$8.25	$21.63	$0.00	$76.73

Notes:

Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

DEMO: ADZEMAN *LABORERS - ZONE 2*	06/01/2021	$40.82	$8.60	$17.57	$0.00	$66.99
	12/01/2021	$41.83	$8.60	$17.57	$0.00	$68.00
	06/01/2022	$42.83	$8.60	$17.57	$0.00	$69.00
	12/01/2022	$43.83	$8.60	$17.57	$0.00	$70.00
	06/01/2023	$44.83	$8.60	$17.57	$0.00	$71.00
	12/01/2023	$46.08	$8.60	$17.57	$0.00	$72.25
For apprentice rates see "Apprentice- LABORER"						
DEMO: BACKHOE/LOADER/HAMMER OPERATOR *LABORERS - ZONE 2*	06/01/2021	$41.82	$8.60	$17.57	$0.00	$67.99
	12/01/2021	$42.83	$8.60	$17.57	$0.00	$69.00
	06/01/2022	$43.83	$8.60	$17.57	$0.00	$70.00
	12/01/2022	$44.83	$8.60	$17.57	$0.00	$71.00
	06/01/2023	$45.83	$8.60	$17.57	$0.00	$72.00
	12/01/2023	$47.08	$8.60	$17.57	$0.00	$73.25
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
DEMO: BURNERS *LABORERS - ZONE 2*	06/01/2021	$41.57	$8.60	$17.57	$0.00	$67.74
	12/01/2021	$42.58	$8.60	$17.57	$0.00	$68.75
	06/01/2022	$43.58	$8.60	$17.57	$0.00	$69.75
	12/01/2022	$44.58	$8.60	$17.57	$0.00	$70.75
	06/01/2023	$45.58	$8.60	$17.57	$0.00	$71.75
	12/01/2023	$46.83	$8.60	$17.57	$0.00	$73.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: CONCRETE CUTTER/SAWYER *LABORERS - ZONE 2*	06/01/2021	$41.82	$8.60	$17.57	$0.00	$67.99
	12/01/2021	$42.83	$8.60	$17.57	$0.00	$69.00
	06/01/2022	$43.83	$8.60	$17.57	$0.00	$70.00
	12/01/2022	$44.83	$8.60	$17.57	$0.00	$71.00
	06/01/2023	$45.83	$8.60	$17.57	$0.00	$72.00
	12/01/2023	$47.08	$8.60	$17.57	$0.00	$73.25
For apprentice rates see "Apprentice- LABORER"						
DEMO: JACKHAMMER OPERATOR *LABORERS - ZONE 2*	06/01/2021	$41.57	$8.60	$17.57	$0.00	$67.74
	12/01/2021	$42.58	$8.60	$17.57	$0.00	$68.75
	06/01/2022	$43.58	$8.60	$17.57	$0.00	$69.75
	12/01/2022	$44.58	$8.60	$17.57	$0.00	$70.75
	06/01/2023	$45.58	$8.60	$17.57	$0.00	$71.75
	12/01/2023	$46.83	$8.60	$17.57	$0.00	$73.00
For apprentice rates see "Apprentice- LABORER"						
DEMO: WRECKING LABORER *LABORERS - ZONE 2*	06/01/2021	$40.82	$8.60	$17.57	$0.00	$66.99
	12/01/2021	$41.83	$8.60	$17.57	$0.00	$68.00
	06/01/2022	$42.83	$8.60	$17.57	$0.00	$69.00
	12/01/2022	$43.83	$8.60	$17.57	$0.00	$70.00
	06/01/2023	$44.83	$8.60	$17.57	$0.00	$71.00
	12/01/2023	$46.08	$8.60	$17.57	$0.00	$72.25
For apprentice rates see "Apprentice- LABORER"						
DIRECTIONAL DRILL MACHINE OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
DIVER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$68.70	$9.40	$23.12	$0.00	$101.22
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$49.07	$9.40	$23.12	$0.00	$81.59
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER TENDER (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$73.60	$9.40	$23.12	$0.00	$106.12
For apprentice rates see "Apprentice- PILE DRIVER"						
DIVER/SLURRY (EFFLUENT) *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$103.05	$9.40	$23.12	$0.00	$135.57
For apprentice rates see "Apprentice- PILE DRIVER"						
DRAWBRIDGE OPERATOR (Construction) *DRAWBRIDGE - SEIU LOCAL 888*	07/01/2020	$26.77	$6.67	$3.93	$0.16	$37.53
ELECTRICIAN *ELECTRICIANS LOCAL 223*	09/01/2020	$43.66	$10.90	$14.66	$0.00	$69.22

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ELECTRICIAN - Local 223*

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$17.46	$10.90	$0.52	$0.00	$28.88
2	45	$19.65	$10.90	$0.59	$0.00	$31.14
3	50	$21.83	$10.90	$0.65	$0.00	$33.38
4	55	$24.01	$10.90	$6.28	$0.00	$41.19
5	60	$26.20	$10.90	$6.77	$0.00	$43.87
6	65	$28.38	$10.90	$7.24	$0.00	$46.52
7	70	$30.56	$10.90	$7.73	$0.00	$49.19
8	75	$32.75	$10.90	$8.21	$0.00	$51.86

Notes:

Apprentice to Journeyworker Ratio:2:3***

ELEVATOR CONSTRUCTOR *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2021	$63.47	$15.88	$19.31	$0.00	$98.66
	01/01/2022	$65.62	$16.03	$20.21	$0.00	$101.86

Apprentice - *ELEVATOR CONSTRUCTOR - Local 4*

Effective Date - 01/01/2021

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

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 *ELEVATOR CONSTRUCTORS LOCAL 4*	01/01/2021	$44.43	$15.88	$19.31	$0.00	$79.62
	01/01/2022	$45.93	$16.03	$20.21	$0.00	$82.17
For apprentice rates see "Apprentice - ELEVATOR CONSTRUCTOR"						
FENCE & GUARD RAIL ERECTOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
FIELD ENG.INST.PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2021	$45.88	$13.50	$15.70	$0.00	$75.08
	11/01/2021	$46.88	$13.50	$15.70	$0.00	$76.08
	05/01/2022	$48.03	$13.50	$15.70	$0.00	$77.23
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.PARTY CHIEF-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2021	$47.40	$13.50	$15.70	$0.00	$76.60
	11/01/2021	$48.41	$13.50	$15.70	$0.00	$77.61
	05/01/2022	$49.57	$13.50	$15.70	$0.00	$78.77
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIELD ENG.ROD PERSON-BLDG,SITE,HVY/HWY *OPERATING ENGINEERS LOCAL 4*	05/01/2021	$22.91	$13.50	$15.70	$0.00	$52.11
	11/01/2021	$23.51	$13.50	$15.70	$0.00	$52.71
	05/01/2022	$24.18	$13.50	$15.70	$0.00	$53.38
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FIRE ALARM INSTALLER *ELECTRICIANS LOCAL 223*	09/01/2020	$43.66	$10.90	$14.66	$0.00	$69.22
For apprentice rates see "Apprentice- ELECTRICIAN"						
FIRE ALARM REPAIR / MAINTENANCE / COMMISSIONING*ELECTRICIANS LOCAL 223*	09/01/2020	$36.86	$10.90	$12.45	$0.00	$60.21
For apprentice rates see "Apprentice- TELECOMMUNICATIONS TECHNICIAN"						
FIREMAN (ASST. ENGINEER) *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$41.31	$13.75	$15.80	$0.00	$70.86
	12/01/2021	$42.26	$13.75	$15.80	$0.00	$71.81
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
FLAGGER & SIGNALER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$24.50	$8.60	$16.64	$0.00	$49.74
	12/01/2021	$24.50	$8.60	$16.64	$0.00	$49.74
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
FLOORCOVERER *FLOORCOVERERS LOCAL 2168 ZONE I*	03/01/2021	$48.59	$9.40	$19.25	$0.00	$77.24
	09/01/2021	$49.39	$9.40	$19.25	$0.00	$78.04
	03/01/2022	$50.19	$9.40	$19.25	$0.00	$78.84

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *FLOORCOVERER - Local 2168 Zone I*

Effective Date - 03/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.30	$9.40	$1.79	$0.00	$35.49
2	55	$26.72	$9.40	$1.79	$0.00	$37.91
3	60	$29.15	$9.40	$13.88	$0.00	$52.43
4	65	$31.58	$9.40	$13.88	$0.00	$54.86
5	70	$34.01	$9.40	$15.67	$0.00	$59.08
6	75	$36.44	$9.40	$15.67	$0.00	$61.51
7	80	$38.87	$9.40	$17.46	$0.00	$65.73
8	85	$41.30	$9.40	$17.46	$0.00	$68.16

Effective Date - 09/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$24.70	$9.40	$1.79	$0.00	$35.89
2	55	$27.16	$9.40	$1.79	$0.00	$38.35
3	60	$29.63	$9.40	$13.88	$0.00	$52.91
4	65	$32.10	$9.40	$13.88	$0.00	$55.38
5	70	$34.57	$9.40	$15.67	$0.00	$59.64
6	75	$37.04	$9.40	$15.67	$0.00	$62.11
7	80	$39.51	$9.40	$17.46	$0.00	$66.37
8	85	$41.98	$9.40	$17.46	$0.00	$68.84

Notes: Steps are 750 hrs.
% After 09/1/17; 45/45/55/55/70/70/80/80 (1500hr Steps)
Step 1&2 $33.03/ 3&4 $39.64/ 5&6 $59.08/ 7&8 $65.73

Apprentice to Journeyworker Ratio:1:1

FORK LIFT/CHERRY PICKER *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.73	$13.75	$15.80	$0.00	$80.28
	12/01/2021	$51.88	$13.75	$15.80	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GENERATOR/LIGHTING PLANT/HEATERS *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$33.40	$13.75	$15.80	$0.00	$62.95
	12/01/2021	$34.19	$13.75	$15.80	$0.00	$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
GLAZIER (GLASS PLANK/AIR BARRIER/INTERIOR SYSTEMS) *GLAZIERS LOCAL 1333*	06/01/2020	$39.18	$10.80	$10.45	$0.00	$60.43

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *GLAZIER - Local 1333*

Effective Date - 06/01/2020

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

Notes:

Apprentice to Journeyworker Ratio:1:3

HOISTING ENGINEER/CRANES/GRADALLS *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.73	$13.75	$15.80	$0.00	$80.28
	12/01/2021	$51.88	$13.75	$15.80	$0.00	$81.43

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *OPERATING ENGINEERS - Local 4*

Effective Date - 06/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$27.90	$13.75	$0.00	$0.00	$41.65
2	60	$30.44	$13.75	$15.80	$0.00	$59.99
3	65	$32.97	$13.75	$15.80	$0.00	$62.52
4	70	$35.51	$13.75	$15.80	$0.00	$65.06
5	75	$38.05	$13.75	$15.80	$0.00	$67.60
6	80	$40.58	$13.75	$15.80	$0.00	$70.13
7	85	$43.12	$13.75	$15.80	$0.00	$72.67
8	90	$45.66	$13.75	$15.80	$0.00	$75.21

Effective Date - 12/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$28.53	$13.75	$0.00	$0.00	$42.28
2	60	$31.13	$13.75	$15.80	$0.00	$60.68
3	65	$33.72	$13.75	$15.80	$0.00	$63.27
4	70	$36.32	$13.75	$15.80	$0.00	$65.87
5	75	$38.91	$13.75	$15.80	$0.00	$68.46
6	80	$41.50	$13.75	$15.80	$0.00	$71.05
7	85	$44.10	$13.75	$15.80	$0.00	$73.65
8	90	$46.69	$13.75	$15.80	$0.00	$76.24

Notes:

Apprentice to Journeyworker Ratio:1:6

HVAC (DUCTWORK) *SHEETMETAL WORKERS LOCAL 17 - B*	07/01/2021	$36.91	$13.65	$17.15	$2.03	$69.74
	10/01/2021	$37.91	$13.65	$17.15	$2.06	$70.77
	04/01/2022	$38.91	$13.65	$17.15	$2.09	$71.80
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (ELECTRICAL CONTROLS) *ELECTRICIANS LOCAL 223*	09/01/2020	$43.66	$10.90	$14.66	$0.00	$69.22
For apprentice rates see "Apprentice- ELECTRICIAN"						
HVAC (TESTING AND BALANCING - AIR) *SHEETMETAL WORKERS LOCAL 17 - B*	07/01/2021	$36.91	$13.65	$17.15	$2.03	$69.74
	10/01/2021	$37.91	$13.65	$17.15	$2.06	$70.77
	04/01/2022	$38.91	$13.65	$17.15	$2.09	$71.80
For apprentice rates see "Apprentice- SHEET METAL WORKER"						
HVAC (TESTING AND BALANCING -WATER) *PLUMBERS & PIPEFITTERS LOCAL 51*	08/31/2020	$44.69	$10.15	$19.80	$0.00	$74.64
	08/30/2021	$46.69	$10.15	$19.80	$0.00	$76.64
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
HVAC MECHANIC *PLUMBERS & PIPEFITTERS LOCAL 51*	08/31/2020	$44.69	$10.15	$19.80	$0.00	$74.64
	08/30/2021	$46.69	$10.15	$19.80	$0.00	$76.64
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
HYDRAULIC DRILLS *LABORERS - ZONE 2*	06/01/2021	$35.75	$8.60	$16.64	$0.00	$60.99
	12/01/2021	$36.66	$8.60	$16.64	$0.00	$61.90
	06/01/2022	$37.56	$8.60	$16.64	$0.00	$62.80
	12/01/2022	$38.41	$8.60	$16.64	$0.00	$63.65
	06/01/2023	$39.31	$8.60	$16.64	$0.00	$64.55
	12/01/2023	$40.21	$8.60	$16.64	$0.00	$65.45
For apprentice rates see "Apprentice- LABORER"						
HYDRAULIC DRILLS (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.75	$8.60	$16.64	$0.00	$60.99
	12/01/2021	$36.66	$8.60	$16.64	$0.00	$61.90
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
INSULATOR (PIPES & TANKS) *HEAT & FROST INSULATORS LOCAL 6 (SOUTHERN MASS)*	09/01/2020	$44.10	$13.80	$17.14	$0.00	$75.04
	09/01/2021	$46.50	$13.80	$17.14	$0.00	$77.44
	09/01/2022	$48.95	$13.80	$17.14	$0.00	$79.89

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

Effective Date - 09/01/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$22.05	$13.80	$12.42	$0.00	$48.27
2	60	$26.46	$13.80	$13.36	$0.00	$53.62
3	70	$30.87	$13.80	$14.31	$0.00	$58.98
4	80	$35.28	$13.80	$15.25	$0.00	$64.33

Effective Date - 09/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.25	$13.80	$12.42	$0.00	$49.47
2	60	$27.90	$13.80	$13.36	$0.00	$55.06
3	70	$32.55	$13.80	$14.31	$0.00	$60.66
4	80	$37.20	$13.80	$15.25	$0.00	$66.25

Notes:
Steps are 1 year

Apprentice to Journeyworker Ratio:1:4

IRONWORKER/WELDER *IRONWORKERS LOCAL 37*	03/16/2021	$42.46	$7.70	$17.10	$0.00	$67.26

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *IRONWORKER - Local 37*

Effective Date - 03/16/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	70	$29.72	$7.70	$17.10	$0.00	$54.52
2	75	$31.85	$7.70	$17.10	$0.00	$56.65
3	80	$33.97	$7.70	$17.10	$0.00	$58.77
4	85	$36.09	$7.70	$17.10	$0.00	$60.89
5	90	$38.21	$7.70	$17.10	$0.00	$63.01
6	95	$40.34	$7.70	$17.10	$0.00	$65.14

Notes:

Apprentice to Journeyworker Ratio:1:4

JACKHAMMER & PAVING BREAKER OPERATOR *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
LABORER *LABORERS - ZONE 2*	06/01/2021	$35.00	$8.60	$16.64	$0.00	$60.24
	12/01/2021	$35.91	$8.60	$16.64	$0.00	$61.15
	06/01/2022	$36.81	$8.60	$16.64	$0.00	$62.05
	12/01/2022	$37.66	$8.60	$16.64	$0.00	$62.90
	06/01/2023	$38.56	$8.60	$16.64	$0.00	$63.80
	12/01/2023	$39.46	$8.60	$16.64	$0.00	$64.70

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *LABORER - Zone 2*

Effective Date - 06/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$21.00	$8.60	$16.64	$0.00	$46.24
2	70	$24.50	$8.60	$16.64	$0.00	$49.74
3	80	$28.00	$8.60	$16.64	$0.00	$53.24
4	90	$31.50	$8.60	$16.64	$0.00	$56.74

Effective Date - 12/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$21.55	$8.60	$16.64	$0.00	$46.79
2	70	$25.14	$8.60	$16.64	$0.00	$50.38
3	80	$28.73	$8.60	$16.64	$0.00	$53.97
4	90	$32.32	$8.60	$16.64	$0.00	$57.56

Notes:

Apprentice to Journeyworker Ratio:1:5

LABORER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.00	$8.60	$16.64	$0.00	$60.24
	12/01/2021	$35.91	$8.60	$16.64	$0.00	$61.15

Apprentice - *LABORER (Heavy & Highway) - Zone 2*

Effective Date - 06/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$21.00	$8.60	$16.64	$0.00	$46.24
2	70	$24.50	$8.60	$16.64	$0.00	$49.74
3	80	$28.00	$8.60	$16.64	$0.00	$53.24
4	90	$31.50	$8.60	$16.64	$0.00	$56.74

Effective Date - 12/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	60	$21.55	$8.60	$16.64	$0.00	$46.79
2	70	$25.14	$8.60	$16.64	$0.00	$50.38
3	80	$28.73	$8.60	$16.64	$0.00	$53.97
4	90	$32.32	$8.60	$16.64	$0.00	$57.56

Notes:

Apprentice to Journeyworker Ratio:1:5

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
LABORER: CARPENTER TENDER *LABORERS - ZONE 2*	06/01/2021	$35.00	$8.60	$16.64	$0.00	$60.24
	12/01/2021	$35.91	$8.60	$16.64	$0.00	$61.15
	06/01/2022	$36.81	$8.60	$16.64	$0.00	$62.05
	12/01/2022	$37.66	$8.60	$16.64	$0.00	$62.90
	06/01/2023	$38.56	$8.60	$16.64	$0.00	$63.80
	12/01/2023	$39.46	$8.60	$16.64	$0.00	$64.70
For apprentice rates see "Apprentice- LABORER"						
LABORER: CEMENT FINISHER TENDER *LABORERS - ZONE 2*	06/01/2021	$35.00	$8.60	$16.64	$0.00	$60.24
	12/01/2021	$35.91	$8.60	$16.64	$0.00	$61.15
	06/01/2022	$36.81	$8.60	$16.64	$0.00	$62.05
	12/01/2022	$37.66	$8.60	$16.64	$0.00	$62.90
	06/01/2023	$38.56	$8.60	$16.64	$0.00	$63.80
	12/01/2023	$39.46	$8.60	$16.64	$0.00	$64.70
For apprentice rates see "Apprentice- LABORER"						
LABORER: HAZARDOUS WASTE/ASBESTOS REMOVER *LABORERS - ZONE 2*	06/01/2021	$35.09	$8.60	$16.70	$0.00	$60.39
	12/01/2021	$36.00	$8.60	$16.70	$0.00	$61.30
	06/01/2022	$36.90	$8.60	$16.70	$0.00	$62.20
	12/01/2022	$37.75	$8.60	$16.70	$0.00	$63.05
	06/01/2023	$38.65	$8.60	$16.70	$0.00	$63.95
	12/01/2023	$39.55	$8.60	$16.70	$0.00	$64.85
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
LABORER: MASON TENDER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
LABORER: MULTI-TRADE TENDER *LABORERS - ZONE 2*	06/01/2021	$35.00	$8.60	$16.64	$0.00	$60.24
	12/01/2021	$35.91	$8.60	$16.64	$0.00	$61.15
	06/01/2022	$36.81	$8.60	$16.64	$0.00	$62.05
	12/01/2022	$37.66	$8.60	$16.64	$0.00	$62.90
	06/01/2023	$38.56	$8.60	$16.64	$0.00	$63.80
	12/01/2023	$39.46	$8.60	$16.64	$0.00	$64.70
For apprentice rates see "Apprentice- LABORER"						
LABORER: TREE REMOVER *LABORERS - ZONE 2*	06/01/2021	$35.00	$8.60	$16.64	$0.00	$60.24
	12/01/2021	$35.91	$8.60	$16.64	$0.00	$61.15
	06/01/2022	$36.81	$8.60	$16.64	$0.00	$62.05
	12/01/2022	$37.66	$8.60	$16.64	$0.00	$62.90
	06/01/2023	$38.56	$8.60	$16.64	$0.00	$63.80
	12/01/2023	$39.46	$8.60	$16.64	$0.00	$64.70
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 *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
LASER BEAM OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
MARBLE & TILE FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2021	$42.57	$11.39	$20.14	$0.00	$74.10
	08/01/2021	$43.69	$11.39	$20.30	$0.00	$75.38
	02/01/2022	$44.16	$11.39	$20.30	$0.00	$75.85

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

Effective Date - 02/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.29	$11.39	$20.14	$0.00	$52.82
2	60	$25.54	$11.39	$20.14	$0.00	$57.07
3	70	$29.80	$11.39	$20.14	$0.00	$61.33
4	80	$34.06	$11.39	$20.14	$0.00	$65.59
5	90	$38.31	$11.39	$20.14	$0.00	$69.84

Effective Date - 08/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.85	$11.39	$20.30	$0.00	$53.54
2	60	$26.21	$11.39	$20.30	$0.00	$57.90
3	70	$30.58	$11.39	$20.30	$0.00	$62.27
4	80	$34.95	$11.39	$20.30	$0.00	$66.64
5	90	$39.32	$11.39	$20.30	$0.00	$71.01

Notes:

Apprentice to Journeyworker Ratio:1:3

MARBLE MASONS,TILELAYERS & TERRAZZO MECH *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2021	$55.77	$11.39	$22.08	$0.00	$89.24
	08/01/2021	$57.17	$11.39	$22.24	$0.00	$90.80
	02/01/2022	$57.74	$11.39	$22.24	$0.00	$91.37

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 02/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.89	$11.39	$22.08	$0.00	$61.36
2	60	$33.46	$11.39	$22.08	$0.00	$66.93
3	70	$39.04	$11.39	$22.08	$0.00	$72.51
4	80	$44.62	$11.39	$22.08	$0.00	$78.09
5	90	$50.19	$11.39	$22.08	$0.00	$83.66

Effective Date - 08/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$28.59	$11.39	$22.24	$0.00	$62.22
2	60	$34.30	$11.39	$22.24	$0.00	$67.93
3	70	$40.02	$11.39	$22.24	$0.00	$73.65
4	80	$45.74	$11.39	$22.24	$0.00	$79.37
5	90	$51.45	$11.39	$22.24	$0.00	$85.08

Notes:

Apprentice to Journeyworker Ratio:1:5

MECH. SWEEPER OPERATOR (ON CONST. SITES) *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MECHANICS MAINTENANCE *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
MILLWRIGHT (Zone 2) *MILLWRIGHTS LOCAL 1121 - Zone 2*	03/01/2021	$39.42	$8.58	$21.57	$0.00	$69.57
	01/03/2022	$40.67	$8.58	$21.57	$0.00	$70.82
	01/02/2023	$41.92	$8.58	$21.57	$0.00	$72.07

Apprentice - *MILLWRIGHT - Local 1121 Zone 2*

Effective Date - 03/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$21.68	$8.58	$5.72	$0.00	$35.98
2	65	$25.62	$8.58	$17.93	$0.00	$52.13
3	75	$29.57	$8.58	$18.98	$0.00	$57.13
4	85	$33.51	$8.58	$20.01	$0.00	$62.10

Effective Date - 01/03/2022

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	55	$22.37	$8.58	$5.72	$0.00	$36.67
2	65	$26.44	$8.58	$17.93	$0.00	$52.95
3	75	$30.50	$8.58	$18.98	$0.00	$58.06
4	85	$34.57	$8.58	$20.01	$0.00	$63.16

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:1:5

MORTAR MIXER *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
OILER (OTHER THAN TRUCK CRANES,GRADALLS) *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$23.40	$13.75	$15.80	$0.00	$52.95
	12/01/2021	$23.98	$13.75	$15.80	$0.00	$53.53
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OILER (TRUCK CRANES, GRADALLS) *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$28.26	$13.75	$15.80	$0.00	$57.81
	12/01/2021	$28.94	$13.75	$15.80	$0.00	$58.49
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
OTHER POWER DRIVEN EQUIPMENT - CLASS II *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PAINTER (BRIDGES/TANKS) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2021	$52.06	$8.25	$22.75	$0.00	$83.06

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 - BRIDGES/TANKS*

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$26.03	$8.25	$0.00	$0.00	$34.28
2	55	$28.63	$8.25	$6.16	$0.00	$43.04
3	60	$31.24	$8.25	$6.72	$0.00	$46.21
4	65	$33.84	$8.25	$7.28	$0.00	$49.37
5	70	$36.44	$8.25	$19.39	$0.00	$64.08
6	75	$39.05	$8.25	$19.95	$0.00	$67.25
7	80	$41.65	$8.25	$20.51	$0.00	$70.41
8	90	$46.85	$8.25	$21.63	$0.00	$76.73

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, NEW) * * If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*	01/01/2021	$42.96	$8.25	$22.75	$0.00	$73.96

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

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$21.48	$8.25	$0.00	$0.00	$29.73
2	55	$23.63	$8.25	$6.16	$0.00	$38.04
3	60	$25.78	$8.25	$6.72	$0.00	$40.75
4	65	$27.92	$8.25	$7.28	$0.00	$43.45
5	70	$30.07	$8.25	$19.39	$0.00	$57.71
6	75	$32.22	$8.25	$19.95	$0.00	$60.42
7	80	$34.37	$8.25	$20.51	$0.00	$63.13
8	90	$38.66	$8.25	$21.63	$0.00	$68.54

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER (SPRAY OR SANDBLAST, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2021	$41.02	$8.25	$22.75	$0.00	$72.02

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

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

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.51	$8.25	$0.00	$0.00	$28.76
2	55	$22.56	$8.25	$6.16	$0.00	$36.97
3	60	$24.61	$8.25	$6.72	$0.00	$39.58
4	65	$26.66	$8.25	$7.28	$0.00	$42.19
5	70	$28.71	$8.25	$19.39	$0.00	$56.35
6	75	$30.77	$8.25	$19.95	$0.00	$58.97
7	80	$32.82	$8.25	$20.51	$0.00	$61.58
8	90	$36.92	$8.25	$21.63	$0.00	$66.80

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, NEW) *	01/01/2021	$41.56	$8.25	$22.75	$0.00	$72.56

* If 30% or more of surfaces to be painted are new construction, NEW paint rate shall be used.*PAINTERS LOCAL 35 - ZONE 2*

Apprentice - *PAINTER - Local 35 Zone 2 - BRUSH NEW*

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$20.78	$8.25	$0.00	$0.00	$29.03
2	55	$22.86	$8.25	$6.16	$0.00	$37.27
3	60	$24.94	$8.25	$6.72	$0.00	$39.91
4	65	$27.01	$8.25	$7.28	$0.00	$42.54
5	70	$29.09	$8.25	$19.39	$0.00	$56.73
6	75	$31.17	$8.25	$19.95	$0.00	$59.37
7	80	$33.25	$8.25	$20.51	$0.00	$62.01
8	90	$37.40	$8.25	$21.63	$0.00	$67.28

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER / TAPER (BRUSH, REPAINT) *PAINTERS LOCAL 35 - ZONE 2*	01/01/2021	$39.62	$8.25	$22.75	$0.00	$70.62

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *PAINTER Local 35 Zone 2 - BRUSH REPAINT*

Effective Date - 01/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$19.81	$8.25	$0.00	$0.00	$28.06
2	55	$21.79	$8.25	$6.16	$0.00	$36.20
3	60	$23.77	$8.25	$6.72	$0.00	$38.74
4	65	$25.75	$8.25	$7.28	$0.00	$41.28
5	70	$27.73	$8.25	$19.39	$0.00	$55.37
6	75	$29.72	$8.25	$19.95	$0.00	$57.92
7	80	$31.70	$8.25	$20.51	$0.00	$60.46
8	90	$35.66	$8.25	$21.63	$0.00	$65.54

Notes:
Steps are 750 hrs.

Apprentice to Journeyworker Ratio:1:1

PAINTER TRAFFIC MARKINGS (HEAVY/HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)* For apprentice rates see "Apprentice- LABORER (Heavy and Highway)	06/01/2021	$35.00	$8.60	$16.64	$0.00	$60.24
	12/01/2021	$35.91	$8.60	$16.64	$0.00	$61.15
PANEL & PICKUP TRUCKS DRIVER *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2021	$35.78	$12.91	$14.82	$0.00	$63.51
	08/01/2021	$35.78	$13.41	$14.82	$0.00	$64.01
	12/01/2021	$35.78	$13.41	$16.01	$0.00	$65.20
PIER AND DOCK CONSTRUCTOR (UNDERPINNING AND DECK) *PILE DRIVER LOCAL 56 (ZONE 1)* For apprentice rates see "Apprentice- PILE DRIVER"	08/01/2020	$49.07	$9.40	$23.12	$0.00	$81.59
PILE DRIVER *PILE DRIVER LOCAL 56 (ZONE 1)*	08/01/2020	$49.07	$9.40	$23.12	$0.00	$81.59

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

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
PIPELAYER *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
PIPELAYER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
PLUMBER & PIPEFITTER *PLUMBERS & PIPEFITTERS LOCAL 51*	08/31/2020	$44.69	$10.15	$19.80	$0.00	$74.64
	08/30/2021	$46.69	$10.15	$19.80	$0.00	$76.64

Apprentice - *PLUMBER/PIPEFITTER - Local 51*

Effective Date - 08/31/2020

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$17.88	$10.15	$2.50	$0.00	$30.53
2	50	$22.35	$10.15	$2.50	$0.00	$35.00
3	60	$26.81	$10.15	$8.73	$0.00	$45.69
4	70	$31.28	$10.15	$10.60	$0.00	$52.03
5	80	$35.75	$10.15	$17.45	$0.00	$63.35

Effective Date - 08/30/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$18.68	$10.15	$2.50	$0.00	$31.33
2	50	$23.35	$10.15	$2.50	$0.00	$36.00
3	60	$28.01	$10.15	$8.73	$0.00	$46.89
4	70	$32.68	$10.15	$10.60	$0.00	$53.43
5	80	$37.35	$10.15	$17.45	$0.00	$64.95

Notes:

Steps 2000hrs. Prior 9/1/05; 40/40/45/50/55/60/65/75/80/85

Apprentice to Journeyworker Ratio:1:3

PNEUMATIC CONTROLS (TEMP.) *PLUMBERS & PIPEFITTERS LOCAL 51*	08/31/2020	$44.69	$10.15	$19.80	$0.00	$74.64
	08/30/2021	$46.69	$10.15	$19.80	$0.00	$76.64
For apprentice rates see "Apprentice- PIPEFITTER" or "PLUMBER/PIPEFITTER"						
PNEUMATIC DRILL/TOOL OPERATOR *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
PNEUMATIC DRILL/TOOL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
POWDERMAN & BLASTER *LABORERS - ZONE 2*	06/01/2021	$36.00	$8.60	$16.64	$0.00	$61.24
	12/01/2021	$36.91	$8.60	$16.64	$0.00	$62.15
	06/01/2022	$37.81	$8.60	$16.64	$0.00	$63.05
	12/01/2022	$38.66	$8.60	$16.64	$0.00	$63.90
	06/01/2023	$39.56	$8.60	$16.64	$0.00	$64.80
	12/01/2023	$40.46	$8.60	$16.64	$0.00	$65.70
For apprentice rates see "Apprentice- LABORER"						
POWDERMAN & BLASTER (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$36.00	$8.60	$16.64	$0.00	$61.24
	12/01/2021	$36.91	$8.60	$16.64	$0.00	$62.15
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)						
POWER SHOVEL/DERRICK/TRENCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.73	$13.75	$15.80	$0.00	$80.28
	12/01/2021	$51.88	$13.75	$15.80	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (CONCRETE) *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.73	$13.75	$15.80	$0.00	$80.28
	12/01/2021	$51.88	$13.75	$15.80	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
PUMP OPERATOR (DEWATERING, OTHER) *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$33.40	$13.75	$15.80	$0.00	$62.95
	12/01/2021	$34.19	$13.75	$15.80	$0.00	$63.74
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
READY-MIX CONCRETE DRIVER *TEAMSTERS 653 - Southeastern Concrete (Weymouth)*	05/01/2021	$24.00	$12.41	$6.90	$0.00	$43.31
	08/01/2021	$24.00	$12.91	$6.90	$0.00	$43.81
	05/01/2022	$24.50	$12.91	$6.90	$0.00	$44.31
	08/01/2022	$24.50	$13.41	$6.90	$0.00	$44.81
	05/01/2023	$25.00	$13.41	$6.90	$0.00	$45.31
	08/01/2023	$25.00	$13.91	$6.90	$0.00	$45.81
RECLAIMERS *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
RIDE-ON MOTORIZED BUGGY OPERATOR *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
ROLLER/SPREADER/MULCHING MACHINE *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
ROOFER (Inc.Roofer Waterproofng &Roofer Damproofg) *ROOFERS LOCAL 33*	02/01/2021	$46.60	$12.28	$17.15	$0.00	$76.03
	08/01/2021	$47.03	$12.28	$18.15	$0.00	$77.46
	02/01/2022	$48.46	$12.28	$18.15	$0.00	$78.89

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *ROOFER - Local 33*

Effective Date - 02/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.30	$12.28	$4.56	$0.00	$40.14
2	60	$27.96	$12.28	$18.15	$0.00	$58.39
3	65	$30.29	$12.28	$18.15	$0.00	$60.72
4	75	$34.95	$12.28	$18.15	$0.00	$65.38
5	85	$39.61	$12.28	$18.15	$0.00	$70.04

Effective Date - 08/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$23.52	$12.28	$4.56	$0.00	$40.36
2	60	$28.22	$12.28	$18.15	$0.00	$58.65
3	65	$30.57	$12.28	$18.15	$0.00	$61.00
4	75	$35.27	$12.28	$18.15	$0.00	$65.70
5	85	$39.98	$12.28	$18.15	$0.00	$70.41

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

Apprentice to Journeyworker Ratio:**

ROOFER SLATE / TILE / PRECAST CONCRETE *ROOFERS LOCAL 33*	02/01/2021	$46.85	$12.28	$17.15	$0.00	$76.28
	08/01/2021	$47.28	$12.28	$18.15	$0.00	$77.71
	02/01/2022	$48.71	$12.28	$18.15	$0.00	$79.14
For apprentice rates see "Apprentice- ROOFER"						
SHEETMETAL WORKER *SHEETMETAL WORKERS LOCAL 17 - B*	07/01/2021	$36.91	$13.65	$17.15	$2.03	$69.74
	10/01/2021	$37.91	$13.65	$17.15	$2.06	$70.77
	04/01/2022	$38.91	$13.65	$17.15	$2.09	$71.80

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *SHEET METAL WORKER - Local 17-B*

Effective Date - 07/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$14.76	$13.65	$4.02	$0.99	$33.42
2	45	$16.61	$13.65	$4.52	$1.07	$35.85
3	50	$18.46	$13.65	$11.08	$1.32	$44.51
4	55	$20.30	$13.65	$11.08	$1.38	$46.41
5	60	$22.15	$13.65	$14.12	$1.50	$51.42
6	65	$23.99	$13.65	$14.38	$1.56	$53.58
7	70	$25.84	$13.65	$14.63	$1.62	$55.74
8	75	$27.68	$13.65	$14.88	$1.69	$57.90
9	80	$29.53	$13.65	$15.14	$1.75	$60.07
10	85	$31.37	$13.65	$15.39	$1.81	$62.22

Effective Date - 10/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	40	$15.16	$13.65	$4.02	$0.98	$33.81
2	45	$17.06	$13.65	$4.52	$1.06	$36.29
3	50	$18.96	$13.65	$11.08	$1.31	$45.00
4	55	$20.85	$13.65	$11.08	$1.37	$46.95
5	60	$22.75	$13.65	$14.12	$1.52	$52.04
6	65	$24.64	$13.65	$14.38	$1.58	$54.25
7	70	$26.54	$13.65	$14.63	$1.64	$56.46
8	75	$28.43	$13.65	$14.88	$1.71	$58.67
9	80	$30.33	$13.65	$15.14	$1.77	$60.89
10	85	$32.22	$13.65	$15.39	$1.84	$63.10

Notes:

Apprentice to Journeyworker Ratio:1:3

SPECIALIZED EARTH MOVING EQUIP < 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2021	$36.24	$12.91	$14.82	$0.00	$63.97
	08/01/2021	$36.24	$13.41	$14.82	$0.00	$64.47
	12/01/2021	$36.24	$13.41	$16.01	$0.00	$65.66
SPECIALIZED EARTH MOVING EQUIP > 35 TONS *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2021	$36.53	$12.91	$14.82	$0.00	$64.26
	08/01/2021	$36.53	$13.41	$14.82	$0.00	$64.76
	12/01/2021	$36.53	$13.41	$16.01	$0.00	$65.95
SPRINKLER FITTER *SPRINKLER FITTERS LOCAL 550 - (Section B) Zone 2*	03/01/2021	$56.21	$10.00	$21.25	$0.00	$87.46

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *SPRINKLER FITTER - Local 550 (Section B) Zone 2*

Effective Date - 03/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	35	$19.67	$10.00	$11.99	$0.00	$41.66
2	40	$22.48	$10.00	$12.70	$0.00	$45.18
3	45	$25.29	$10.00	$13.41	$0.00	$48.70
4	50	$28.11	$10.00	$14.13	$0.00	$52.24
5	55	$30.92	$10.00	$14.84	$0.00	$55.76
6	60	$33.73	$10.00	$15.55	$0.00	$59.28
7	65	$36.54	$10.00	$16.26	$0.00	$62.80
8	70	$39.35	$10.00	$16.98	$0.00	$66.33
9	75	$42.16	$10.00	$17.69	$0.00	$69.85
10	80	$44.97	$10.00	$18.40	$0.00	$73.37

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*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TAMPERS, SELF-PROPELLED OR TRACTOR DRAWN *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TELECOMMUNICATION TECHNICIAN *ELECTRICIANS LOCAL 223*	09/01/2020	$36.86	$10.90	$12.45	$0.00	$60.21

Apprentice - *TELECOMMUNICATION TECHNICIAN - Local 223*

Effective Date - 09/01/2020

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

Notes: See Electrician Apprentice Wages

Telecom Apprentice Wages shall be the same as the Electrician Apprentice Wages

Apprentice to Journeyworker Ratio:2:3***

TERRAZZO FINISHERS *BRICKLAYERS LOCAL 3 - MARBLE & TILE*	02/01/2021	$54.69	$11.39	$22.09	$0.00	$88.17
	08/01/2021	$56.09	$11.39	$22.25	$0.00	$89.73
	02/01/2022	$56.68	$11.39	$22.25	$0.00	$90.32

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *TERRAZZO FINISHER - Local 3 Marble & Tile*

Effective Date - 02/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$27.35	$11.39	$22.09	$0.00	$60.83
2	60	$32.81	$11.39	$22.09	$0.00	$66.29
3	70	$38.28	$11.39	$22.09	$0.00	$71.76
4	80	$43.75	$11.39	$22.09	$0.00	$77.23
5	90	$49.22	$11.39	$22.09	$0.00	$82.70

Effective Date - 08/01/2021

Step	percent	Apprentice Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
1	50	$28.05	$11.39	$22.25	$0.00	$61.69
2	60	$33.65	$11.39	$22.25	$0.00	$67.29
3	70	$39.26	$11.39	$22.25	$0.00	$72.90
4	80	$44.87	$11.39	$22.25	$0.00	$78.51
5	90	$50.48	$11.39	$22.25	$0.00	$84.12

Notes:

Apprentice to Journeyworker Ratio:1:3

TEST BORING DRILLER *LABORERS - FOUNDATION AND MARINE*	06/01/2021	$42.07	$8.60	$17.72	$0.00	$68.39
	12/01/2021	$43.08	$8.60	$17.72	$0.00	$69.40
For apprentice rates see "Apprentice- LABORER"						
TEST BORING DRILLER HELPER *LABORERS - FOUNDATION AND MARINE*	06/01/2021	$40.79	$8.60	$17.72	$0.00	$67.11
	12/01/2021	$41.80	$8.60	$17.72	$0.00	$68.12
For apprentice rates see "Apprentice- LABORER"						
TEST BORING LABORER *LABORERS - FOUNDATION AND MARINE*	06/01/2021	$40.67	$8.60	$17.72	$0.00	$66.99
	12/01/2021	$41.68	$8.60	$17.72	$0.00	$68.00
For apprentice rates see "Apprentice- LABORER"						
TRACTORS/PORTABLE STEAM GENERATORS *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.19	$13.75	$15.80	$0.00	$79.74
	12/01/2021	$51.33	$13.75	$15.80	$0.00	$80.88
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
TRAILERS FOR EARTH MOVING EQUIPMENT *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2021	$36.82	$12.91	$14.82	$0.00	$64.55
	08/01/2021	$36.82	$13.41	$14.82	$0.00	$65.05
	12/01/2021	$36.82	$13.41	$16.01	$0.00	$66.24
TUNNEL WORK - COMPRESSED AIR *LABORERS (COMPRESSED AIR)*	06/01/2021	$52.90	$8.60	$18.17	$0.00	$79.67
	12/01/2021	$53.91	$8.60	$18.17	$0.00	$80.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - COMPRESSED AIR (HAZ. WASTE) *LABORERS (COMPRESSED AIR)*	06/01/2021	$54.90	$8.60	$18.17	$0.00	$81.67
	12/01/2021	$55.91	$8.60	$18.17	$0.00	$82.68
For apprentice rates see "Apprentice- LABORER"						
TUNNEL WORK - FREE AIR *LABORERS (FREE AIR TUNNEL)*	06/01/2021	$44.97	$8.60	$18.17	$0.00	$71.74
	12/01/2021	$45.98	$8.60	$18.17	$0.00	$72.75
For apprentice rates see "Apprentice- LABORER"						

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate
TUNNEL WORK - FREE AIR (HAZ. WASTE) *LABORERS (FREE AIR TUNNEL)*	06/01/2021	$46.97	$8.60	$18.17	$0.00	$73.74
	12/01/2021	$47.98	$8.60	$18.17	$0.00	$74.75
For apprentice rates see "Apprentice- LABORER"						
VAC-HAUL *TEAMSTERS JOINT COUNCIL NO. 10 ZONE B*	06/01/2021	$36.24	$12.91	$14.82	$0.00	$63.97
	08/01/2021	$36.24	$13.41	$14.82	$0.00	$64.47
	12/01/2021	$36.24	$13.41	$16.01	$0.00	$65.66
WAGON DRILL OPERATOR *LABORERS - ZONE 2*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
	06/01/2022	$37.06	$8.60	$16.64	$0.00	$62.30
	12/01/2022	$37.91	$8.60	$16.64	$0.00	$63.15
	06/01/2023	$38.81	$8.60	$16.64	$0.00	$64.05
	12/01/2023	$39.71	$8.60	$16.64	$0.00	$64.95
For apprentice rates see "Apprentice- LABORER"						
WAGON DRILL OPERATOR (HEAVY & HIGHWAY) *LABORERS - ZONE 2 (HEAVY & HIGHWAY)*	06/01/2021	$35.25	$8.60	$16.64	$0.00	$60.49
	12/01/2021	$36.16	$8.60	$16.64	$0.00	$61.40
For apprentice rates see "Apprentice- LABORER (Heavy and Highway)"						
WASTE WATER PUMP OPERATOR *OPERATING ENGINEERS LOCAL 4*	06/01/2021	$50.73	$13.75	$15.80	$0.00	$80.28
	12/01/2021	$51.88	$13.75	$15.80	$0.00	$81.43
For apprentice rates see "Apprentice- OPERATING ENGINEERS"						
WATER METER INSTALLER *PLUMBERS & PIPEFITTERS LOCAL 51*	08/31/2020	$44.69	$10.15	$19.80	$0.00	$74.64
	08/30/2021	$46.69	$10.15	$19.80	$0.00	$76.64
For apprentice rates see "Apprentice- PLUMBER/PIPEFITTER" or "PLUMBER/GASFITTER"						
Outside Electrical - East						
CABLE TECHNICIAN (Power Zone) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$29.67	$9.25	$1.89	$0.00	$40.81
For apprentice rates see "Apprentice- LINEMAN"						
CABLEMAN (Underground Ducts & Cables) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$42.03	$9.25	$10.27	$0.00	$61.55
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN CDL *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$34.62	$9.25	$10.07	$0.00	$53.94
For apprentice rates see "Apprentice- LINEMAN"						
DRIVER / GROUNDMAN -Inexperienced (<2000 Hrs) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$27.20	$9.25	$1.82	$0.00	$38.27
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class A CDL) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$42.03	$9.25	$14.35	$0.00	$65.63
For apprentice rates see "Apprentice- LINEMAN"						
EQUIPMENT OPERATOR (Class B CDL) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$37.09	$9.25	$10.87	$0.00	$57.21
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$27.20	$9.25	$1.82	$0.00	$38.27
For apprentice rates see "Apprentice- LINEMAN"						
GROUNDMAN -Inexperienced (<2000 Hrs.) *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$22.25	$9.25	$1.82	$0.00	$33.32
For apprentice rates see "Apprentice- LINEMAN"						
JOURNEYMAN LINEMAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	08/30/2020	$49.45	$9.25	$17.48	$0.00	$76.18

Classification	Effective Date	Base Wage	Health	Pension	Supplemental Unemployment	Total Rate

Apprentice - *LINEMAN (Outside Electrical) - East Local 104*

Effective Date - 08/30/2020

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

Notes:

Apprentice to Journeyworker Ratio:1:2

TELEDATA CABLE SPLICER *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$30.73	$4.70	$3.17	$0.00	$38.60
TELEDATA LINEMAN/EQUIPMENT OPERATOR *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$28.93	$4.70	$3.14	$0.00	$36.77
TELEDATA WIREMAN/INSTALLER/TECHNICIAN *OUTSIDE ELECTRICAL WORKERS - EAST LOCAL 104*	02/04/2019	$28.93	$4.70	$3.14	$0.00	$36.77

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.

The Massachusetts Prevailing Wage Law
M.G.L. ch. 149, §§ 26 – 27

NOTICE TO AWARDING AUTHORITIES

- 'The enclosed wage schedule applies only to the specific project listed at the top and will be updated for any public construction project lasting longer than one (1) year.
- 'You should request an updated wage schedule from the Division of Occupational Safety if you have not opened bids or selected a contractor within 90 days of the date of issuance of the enclosed wage schedule.
- 'The wage schedule shall be incorporated in any advertisement or call for bids for the project for which it has been issued.
- 'Once a contractor has been selected by the awarding authority, the wage schedule shall be made a part of the contract for that project.

NOTICE TO CONTRACTORS

- The enclosed wage schedule, and any updated schedule, must be posted in a conspicuous place at the work site during the life of the project.
- The wages listed on the enclosed wage schedule must be paid to employees on public works projects regardless of whether they are employed by the prime contractor, a filed sub-bidder, or any sub-contractor.
- The enclosed wage schedule applies to all phases of the project including the final clean-up. Contractors whose only role is to perform final clean-up must pay their employees according to this wage schedule.
- All apprentices must be registered with the Massachusetts Division of Apprentice Training in order to be paid at the reduced apprentice rates. If a worker is not registered with the Division of Apprentice Training, they must be paid the “total rate” listed on the wage schedule regardless of experience or skill level. For further information, please call (617) 727-3486 or write to the Division of Apprentice Training, 399 Washington Street, 4th Floor, Boston, MA 02108

WEEKLY PAYROLL RECORDS REPORT
& STATEMENT OF COMPLIANCE

In accordance with Massachusetts General Law c149, §27B, a true and accurate record must be kept of all persons employed on the public works project for which the enclosed rates have been provided. A Payroll Form has been printed on the reverse of this page and includes all the information required to be kept by law. Every contractor or subcontractor is required to keep these records and preserve them for a period of three years from the date of completion of the contract.

In addition, every contractor and subcontractor is required to submit a copy of its weekly payroll records to the awarding authority. This is required to be done on a weekly basis. Once collected, the awarding authority is also required to preserve those records for three years.

In addition, each such contractor, subcontractor or public body shall furnish to the Department of Labor & Workforce Development/Division of Occupational Safety within fifteen days after completion of its portion of the work a statement, executed by the contractor, subcontractor or public body who supervises the payment of wages, in the following form:

STATEMENT OF COMPLIANCE

_____, 2021

I,_____,_____
(Name of signatory party) (Title)
do hereby state:
That I pay or supervise the payment of the persons employed by
_____ on the _____
(Contractor, subcontractor or public body) (Building or project)
and that all mechanics and apprentices, teamsters, chauffeurs and laborers employed on said project have been paid in accordance with wages determined under the provisions of sections twenty-six and twenty-seven of chapter one hundred and forty-nine of the General Laws.

Signature _____

Title _____

DIVISION OF OCCUPATIONAL SAFETY, 399 WASHINGTON STREET, 5TH FL., BOSTON, MA. 02108

WEEKLY PAYROLL REPORT FORM

Company Name:

Project Name:

Awarding Auth.:

Work Week Ending:

Prime Contractor

Subcontractor
List Prime Contractor:

Employer Signature:

Print Name & Title:

Employee Name & Address	Work Classification	Hours Worked							(A) Tot. Hrs.	(B) Hourly Base Wage	Employer Contributions			(F) [B+C+D+E] Hourly Total Wage (prev. wage)	(G) [A*F] Weekly Total Amount
											(C) Health & Welfare	(D) Pension	(E) Supp. Unemp		
		S	M	T	W	T	F	S							

NOTE: Every contractor and subcontractor is required to submit a copy of their weekly payroll records to the awarding authority.

1.0 DEFINITIONS

1.1 THE CONTRACT DOCUMENTS

The term "Contract Documents" sometimes also referred to as the "Contract", means the contract entered into between the Town of Wareham (hereinafter "Town") and the Contractor. It includes the Invitation for Bid, General Bid Form, Contract Form, these General Conditions of the Contract, Supplements and Amendments to the General Conditions (if any), Contract Specifications, Drawings, all addenda issued prior to execution of the contract, the Bid Bond, the Labor and Material Payment Bond, or other assurances of completion, the applicable wage rate determinations, and other documents listed in the Agreement and modifications issued after execution of the contract.

1.2 THE WORK

The term "Work", sometimes also referred to as the "Project", means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligation.

1.3 OWNER

The term "Owner" is the Town of Wareham.

1.4 CONTRACT OFFICER

The term "Contract Officer" means the person appointed by the Owner to administer the terms of the Contract between the Owner and the Contractor, who is also empowered to take certain actions under this Agreement.

1.5 CONTRACTOR

1.5.1 The Contractor, sometimes referred to as the General Contractor, is the person or entity identified as such throughout the Contract Documents as if singular in number. The term Contractor means the Contractor or its authorized representative.

1.5.2 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences and procedures, and for coordinating all portions of the Work under the Contract.

1.6 SUBSTANTIAL COMPLETION

The term "Substantial Completion" means the value of the work remaining to be performed by the Contractor is, in the estimate of the awarding authority, less than one percent (1%) of the original contract price.

2.0 CONTRACT ADMINISTRATION

2.1 PRE-CONSTRUCTION CONFERENCE

2.1.1 Prior to commencement of the Work, the Contractor shall meet in conference with representatives of the Owner regarding the Owner's requirements under the Contract for administration of the quality assurance program, safety program, labor provisions, the schedule of work, and other Contract procedures.

2.1.2 The Contractor shall begin work upon receipt of a written Notice to Proceed from the Contract Officer or designee. The Contractor shall not begin work prior to receiving such notice.

2.2 CONTRACT PERIOD

The Contractor shall complete all work required under this contract within the timeframe specified elsewhere in this document, or within the time schedule established in the notice to proceed issued by the Contracting Officer.

2.3 REJECTION OF DEFECTIVE MATERIALS AND WORK

The Owner's inspection of the Work shall not relieve the Contractor of any of its responsibilities to fulfill the Contract obligations, and defective work shall be corrected without cost to the Owner. Unsuitable work may be rejected by the Owner, notwithstanding that such work and materials have been previously overlooked or misjudged by the Owner and accepted for payment. If the Work or any part thereof shall be found defective at any time before the final acceptance of the whole Work, the Contractor shall forthwith correct such defect in a manner satisfactory to the Owner, and if any material brought upon the site for use in the Work, or selected for the same, shall be rejected by the Owner as unsuitable or not in conformity with the Contract requirements, the Contractor shall forthwith remove such materials from the vicinity of the Work.

2.4 CHANGES

2.4.1 All changes in the work including any increase, decrease, or other equitable adjustment in the Contract price or in the time for performing the Contract, shall be authorized in writing by the Owner and/or Contract Officer prior to commencement.

2.5 CONTRACT PRICE

The Contract Price is stated in the Contract Form, and including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

2.6 APPLICATIONS FOR PAYMENT

2.6.1 Once each month, on a date established by the Owner at the beginning of the Work, the Contractor shall deliver to the Owner an itemized Application for Payment, supported by such data substantiating the Contractor's right to payment as the Owner may require, and reflecting a minimum of 5% retainage until the final acceptance and payment by the Owner.

2.6.2 The Owner shall make payment to the Contractor within 30 days of receipt of said application, less any applicable retainage.

2.6.3 The Owner may make changes in any application for payment submitted by the Contractor for:

i. Retention based on the value of its claims against the Contractor,
ii. Retention of 5% of the approved amount of the Application for Payment.

2.7 FINAL PAYMENT

The acceptance by the Contractor of the last payment due under this Contract or the execution of the Final Certificate of Completion, shall operate as a release to the Owner from all claims and liability related to this Contract.

2.8 GUARANTY AND WARRANTY

2.8.1 WARRANTY

The Contractor warrants to the Owner that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. If required by the Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

2.8.2 GENERAL GUARANTY

If at any time during the period of one (1) year from the date of Substantial Completion of the Work to be performed under this Contract, any part of the Work shall, in the reasonable determination of the Owner, require replacing or repairing due to the fact that it is broken, defective, or otherwise does not conform to the Contract Documents, the Owner will notify the Contractor to make the required repairs or replacement. If the Contractor shall neglect to commence such repairs or replacement to the satisfaction of the Owner within ten (10) days from the date of giving or mailing such notice, then the Owner may employ other persons to make the same.

The Contractor agrees, upon demand, to pay to the Owner all amounts which the Owner expends for such repairs or replacements. During this one year guarantee period any corrective work shall be performed in accordance with the applicable terms of this Contract. For items of work completed after use and occupancy has been taken, the one year guarantee shall commence at the time the Owner accepts such items. This one year guarantee shall not limit any express guaranty or warranty provided elsewhere in the Contract.

2.9 INSURANCE REQUIREMENTS

2.9.1 The Contractor shall provide insurance coverage as listed below. This insurance shall be provided at the Contractor's expense and shall be in full force and effect during the full term of this Contract.

WORKER'S COMPENSATION

Worker's Compensation:	Per M.G.L. c.. l49, s. 34 and c.. l52 as amended.

COMMERCIAL GENERAL LIABILITY

Personal Injury	$500,000 each occurrence $1,000,000 aggregate
Property Damage	$500,000 each occurrence $1,000,000 aggregate

VEHICLE LIABILITY

Personal Injury	$500,000 each person $1,000,000 aggregate
Property Damage	$300,000 each occurrence $500,000 aggregate

2.9.2 OWNER AS CO-INSURED

The Owner shall be named as additional insureds on the Contractor's Liability Policies.

2.9.3 CERTIFICATES OF INSURANCE, POLICIES

i. The Contractor shall not commence the work until proof of compliance with this Section 2.9 has been furnished to the Owner by submitting one copy of a properly endorsed insurance certificate issued by a company authorized to write insurance in the Commonwealth. This certificate shall indicate that the contractual liability coverage is in force.

ii. The Contractor shall file the original and one certified copy of all policies with the Owner within fifteen (15) days after contract award. If the Owner is damaged by the Contractor's failure to maintain such insurance and to so notify the Owner, then the Contractor shall be responsible for all reasonable costs attributable thereto.

2.9.4 CANCELLATION

Cancellation of any insurance required by this contract, whether by the insurer or the insured, shall not be valid unless written notice thereof is given by the party proposing cancellation to the other party and Owner at least thirty days prior to the effective date thereof, which shall be expressed in said notice.

2.10 INDEMNIFICATION

The Contractor shall take all responsibility for the Work and take all precautions for preventing injuries to persons and property in or about the Work; shall bear all losses resulting to or on account of the amount or character of the Work. The Contractor shall pay or cause payment to be made for all labor performed or furnished and for all materials used or employed in carrying out this Contract. The Contractor shall assume the defense of, and indemnify and save harmless the Owner, and the Owner's officers and agents from all claims relating to labor performed or furnished and materials used or employed for the Work; to inventions, patents and patent rights used in and in doing the Work unless such patent infringement is due to a product or process specified by the Owner; to injuries to any person or corporation received or sustained by or from the Contractor and any employees, and subcontractors and employees, in doing the work, or in consequence of any improper materials, implements or labor used or employed therein; and to any act, omission or neglect of the Contractor and any employees therein.

2.11 BONDS

The Contractor shall provide the Owner with a performance and with a payment or labor and materials bond in the form provided by the Owner, executed by a surety company licensed by the Commonwealth of Massachusetts' Division of Insurance. Such bond shall be in an amount equal to at least one half of the Contract price unless otherwise stated in the Contract Documents. All bonds shall be accompanied by a current power of attorney.

2.12 TERMINATION

2.12.1 TERMINATION FOR CAUSE

i. The Owner may terminate this contract for cause if it determines that any of the following circumstances have occurred:
   a. The Contractor is adjudged bankrupt or has made a general assignment for the benefit of its creditors.
   b. A receiver has been appointed of the Contractor's property.
   c. All or a part of the Work has been abandoned.
   d. The Contractor has sublet or assigned all or any portion of the Work, the Contract, or claims thereunder, without the prior written consent of the Owner, except as provided in the Contract.
   e. The Owner has determined that the rate of progress required on the project is not being met.
   f. The Contractor has substantially violated any provisions of this Contract.

ii. The Owner may complete the Work, or any part thereof, and charge its expense of so completing the Work or part thereof, to the Contractor.

iii. The Owner may take possession of and use any materials, machinery, implements and tools found upon the site of said Work. The Owner shall not be liable for any depreciation, loss or damage to said materials, machinery, implements or tools during said use and the Contractor shall be solely responsible for their removal from the Project site after the Owner has no further use for them.

2.12.2 TERMINATION - NO FAULT

i. In the event that this Contract is terminated by the Owner, prior to the completion of construction and termination is not based on a reason listed in Paragraph 2.12.1, the Contractor shall be compensated for its costs incurred on the Project, including reasonable costs of de-mobilization, covering the period of time between the last approved application for payment and the date of termination.

ii. Payment by the Owner pursuant to Section 2.7 shall be considered to fully compensate the Contractor for all claims and expenses and those of any consultants, subcontractors, and suppliers, directly or indirectly attributable to the termination, including any claims for lost profits.

2.13 PERMITS, FEES, AND NOTICES

2.13.1 The Contractor shall secure and the Owner shall pay for the building permit, if required. The Contractor shall coordinate all efforts required to obtain this permit. All other permits and governmental fees, licenses, and inspections necessary for proper execution and completion of the Work shall be secured and paid for by the Contractor.

2.13.2 The Contractor shall comply with and give notices required by laws, ordinances rules, regulations, and lawful orders of public authorities bearing on performance of the Work.

2.13.3 If the Contractor performs Work that it knows or reasonably should know is contrary to laws, statutes, ordinances, building codes, and rules and regulations without such notice to the Owner, the Contractor shall assume full responsibility for such Work and shall bear the attributable costs.

2.14 SAFETY REQUIREMENTS

2.14.1 The Contractor shall comply with all Federal, State, and local safety laws and regulations applicable to the Work performed under this Contract.

2.15 TEMPORARY HEATING

Not required.

2.16 AVAILABILITY AND USE OF UTILITY SERVICES

2.16.1 The Town shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the Contract. Unless otherwise provided in the Contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the Town or, where the utility is produced by the Town, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.

2.17 DISPUTES

2.17.1 "Claim," as used in this section, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to the contract. A claim arising under the Contract, unlike a claim relating to the Contract, is a claim that can be resolved under a Contract clause that provides for the relief sought by the claimant. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim. The submission may be converted to a claim by complying with the requirements of this section, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.

2.17.2 All disputes arising under or relating to this Contract, including any claims for damages for the alleged breach thereof which are not disposed of by agreement, shall be resolved under this section.

2.17.3 All claims by the Contractor shall be made in writing and submitted to the Contract Officer for a written decision. A claim by the Town against the Contractor shall be subject to a written decision by the Contract Officer.

2.17.4 The Contract Officer shall, within thirty (30) days after receipt of the request, decide the claim or notify the Contractor of the date by which the decision will be made.

2.17.5 The Contract Officer's decision shall be final unless the Contractor (1) appeals in writing to a higher level in the Town, (2) refers the appeal to an independent mediator or arbitrator, or (3) files suit in a court of competent jurisdiction. Such appeal must be made within thirty (30) days after receipt of the Contract Officer's decision.

2.17.6 The Contractor shall proceed diligently with performance of this Contract and/or any authorized change thereof, pending final resolution of any request for relief, claim, appeal, or action arising under or relating to the Contract and/or any authorized change thereof, and comply with any decision of the Contract Officer.

2.18 LIQUIDATED DAMAGES

2.18.1 If the Contractor fails to complete the Work within the time specified in the contract, or any extension thereof, the Contractor shall pay to the Town as liquidated damages, the sum of $250.00 for each day of delay. Completion dates are specified in the Contract for separate phases of the work, and the amount of liquidated damages shall be assessed on each and every phase which is delayed. In the contect of this paragraph, “delay” means failure to complete the work as specified in these documents prior to the duration of the work. To the extent that the Contractor's delay or nonperformance is excused under another section in this Contract, liquidated damages shall not be due the Town. The Contractor remains liable for damages caused other than by delay.

2.18.2 If the Town terminates the Contractor's right to proceed pursuant to section 2.12.1, the resulting damage will consist of liquidated damages until such reasonable time as may be required for final completion of the Work together with any increased costs to the Town in completing the Work.

2.18.3 If the Town does not terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until the Work is completed or accepted.

3.0 SALES TAX EXEMPTION AND OTHER TAXES

3.0.1 To the extent that materials and supplies are used or incorporated in the performance of this Contract, the Contractor is considered an exempt purchaser under the Massachusetts Sales Act, Chapter 14 of the Acts of 1966.

3.0.2 The Contractor shall be responsible for paying all other taxes and tariffs of any sort, related to the Work.

3.1 PROHIBITION AGAINST LIENS

The Contractor is prohibited from placing a lien on the Town's property. This prohibition shall apply to all subcontractors at any tier and all materials suppliers.

3.2 ORDER OF PRECEDENCE

In the event of a conflict between these General Conditions and the Specifications, the General Conditions shall prevail. In the event of a conflict between the Contract and any applicable state or local law or regulation, the state or local law or regulation shall prevail; provided that such state or local law or regulation does not conflict with, or is less restrictive than applicable federal law, regulation, or Executive Order. In the event of such a conflict, applicable federal law, regulation, and Executive Order shall prevail.

3.3 EXAMINATION AND RETENTION OF CONTRACTOR'S RECORDS

The Town of Wareham shall, until three (3) years after final payment under this Contract, have access to and the right to examine any of the Contractor's directly pertinent books, documents, papers, or other records involving transactions related to this Contract for the purpose of making audit, examination, excerpts, and/or transcriptions.

END OF GENERAL CONDITIONS

SPECIAL CONDITIONS

COMMONWEALTH OF MASSACHUSETTS
&
TOWN OF WAREHAM

INDEX

SPECIAL CONDITIONS - COMMONWEALTH OF MASSACHUSETTS

Article 1. METHOD OF PAYING SUBCONTRACTORS

(General Laws, Chapter 30, Section 39F as most recently amended by Chapter 450, §76 of the Acts of 1996)

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

(a) Forthwith after the general contractor receives payment on account of a periodic estimate, the general contractor shall pay to each subcontractor the amount paid for the labor performed and the materials furnished by the subcontractor, less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

(b) Not later than the sixty-fifth day after each subcontractor substantially completes his work in accordance with the plans and specifications, the entire balance due under the subcontract less amounts retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, shall be due the subcontractor; and the awarding authority shall pay that amount to the general contractor. The general contractor shall forthwith pay to the subcontractor the full amount received from the awarding authority less any amount specified in any court proceedings barring such payment and also less any amount claimed due from the subcontractor by the general contractor.

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

(d) If, within seventy days after the subcontractor has substantially completed the subcontract work, the subcontractor has not received from the general contractor the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount retained by the awarding authority as the estimated cost of completing the incomplete and unsatisfactory items of work, the subcontractor may demand direct payment of the balance from the awarding authority. The demand shall be by a sworn statement delivered to or sent by certified mail to the awarding authority, and a copy shall be delivered to or sent by certified mail to the general contractor at the same time. The demand shall contain a detailed breakdown of the balance due under the subcontract and also a statement of the status of completion of the subcontract work. Any demand made after substantial completion of the subcontract work shall be valid even if delivered or mailed prior to the seventieth day after the subcontractor has substantially completed the subcontract work. Within ten days after the subcontractor has delivered or so mailed the demand to the awarding authority and delivered or so mailed a copy to the general contractor, the general contractor may reply to the demand. The reply shall be by a sworn statement delivered to or sent by certified mail to the awarding authority and a copy shall be delivered to or sent by certified mail to the subcontractor at the same time. The reply shall contain a detailed breakdown of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor and of the amount due for each claim made by the general contractor against the subcontractor.

(e) Within fifteen days after receipt of the demand by the awarding authority, but in no event prior to the seventieth day after substantial completion of the subcontract work, the awarding authority shall make direct payment to the subcontractor of the balance due under the subcontract including any amount due for extra labor and materials furnished to the general contractor, less any amount (i) retained by the awarding authority as the estimated cost of completing the incomplete or unsatisfactory items of work, (ii) specified in any court proceedings barring such payment, or (iii) disputed by the general contractor in the sworn reply; provided, that the awarding authority shall not deduct form 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 for accounts in a bank pursuant to subparagraph (f) shall be made out of amounts payable to the general contractor at the time of receipt of a demand for direct payment from a subcontractor and out of amounts which later become payable to the general contractor and in the order of receipt of such demands from subcontractors. All direct payments shall discharge the obligation of the awarding authority to the general contractor to the extent of such payment.

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

(i) If the subcontractor does not receive payment as provided in subparagraph (a) or if the general contractor does not submit a periodic estimate for the value of the labor or materials performed or furnished by the subcontractor and the subcontractor does not receive payment for same when due less the deductions provided for in subparagraph (a), the subcontractor may demand direct payment by following the procedure in subparagraph (d) and the general contractor may file a sworn 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 GENERAL CONTRACTORS

(General Laws, Chapter 30, Section 39K as most recently amended by Chapter 145 of the Acts of 1991 and Chapter 151 of the Acts of 1993.)

Every contract for the construction, reconstruction, alteration, remodeling, repair or demolition of any public building by the commonwealth, or by any county, city, town, district, board, commission or other public body, when the amount is more than five thousand dollars in the case of the commonwealth and more than two thousand dollars in the case of any county, city, town, district, board, commission or other public body, shall contain the following paragraph:--Within fifteen days (forty-five days in the case of the commonwealth, including local housing authorities) after receipt from the contractor, at the place designated by the awarding authority if such a place is so designated, of a periodic estimate requesting payment of the amount due for the preceding month, the awarding authority will make a periodic payment to the contractor for the work performed during the preceding month and for the materials not incorporated in the work but delivered and suitably stored at the site (or at some location agreed upon in writing) to which the contractor has title or to which a subcontractor has title and has authorized the contractor to transfer title to the awarding authority, less (1) a retention based on its estimate of the fair value of its claims against the contractor and less (2) a retention for direct payments to subcontractors based on demands for same in accordance with the provisions of section thirty-nine F, and less (3) a retention not exceeding five per cent 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 per cent 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 section thirty-nine F, or based on the record of payments by the contractor to the subcontractors under this contract if such record of payment indicates that the contractor has not paid subcontractors as provided in section thirty-nine F. If the awarding authority fails to make payment as herein provided, there shall be added to each such payment daily interest at the rate of three percentage points above the rediscount rate then charged by the Federal Reserve Bank of Boston

commencing on the first day after said payment is due and continuing until the payment is delivered or mailed to the contractor; provided, that no interest shall be due, in any event, on the amount due on a periodic estimate for final payment until fifteen days (twenty-four days in the case of the commonwealth) after receipt of such a periodic estimate from the contractor, at the place designated by the awarding authority if such a place is so designated. The contractor agrees to pay to each subcontractor a portion of any such interest paid in accordance with the amount due each subcontractor.

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

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

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

Article 3. CLAIMS FOR UNFORESEEN CONDITIONS

(General Laws, Chapter 30, Section 39N as most recently amended by Chapter 774 of the Acts of 1972)

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

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

Article 4. CLAIMS FOR DELAY

(General Laws, Chapter 30, Section 390 as added by Chapter 116 of the Acts of 1973)

Every contract subject to the provisions of section thirty-nine M of this chapter or subject to section forty-four A of chapter one hundred forty-nine shall contain the following provisions (a) and (b) in their entirety and, 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 fifteen 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 of failure to act and, in any event, not later than the date of final payment under this contract and, except for costs due to a suspension order, the awarding authority shall not approve any costs in the claim incurred more than twenty days before the general contractor notified the awarding authority in writing of the act of failure to act involved in the claim.

Article 5. DECISIONS AND APPROVALS BY ENGINEER OR ARCHITECT

(General Laws, Chapter 30, Section 39P, as added by Chapter 1164 of the Acts of 1973)

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

Article 6. PREFERENCE IN EMPLOYMENT, WAGES

(General Laws, Chapter 149 Section 26 as most recently amended by Chapter 665 of the Acts of 1986 and Chapter 552 of the Acts of 1991).

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 six months at the commencement of their employment who are male veterans as defined in clause Forty-third of section seven of chapter four, and who are qualified to perform the work to which the employment relates; and secondly, to citizens of the commonwealth generally who have been residents of the commonwealth for at least six months at the commencement of their employment, and if they cannot be obtained in sufficient numbers, then to citizens of the United States, and every contract for such work shall contain a provision to this effect. 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 said 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 in the private construction industry between organized labor and employers, the rate or rates to be paid on said works shall not be less than the rates so established, provided, further that in towns where no such rate or rates have been so

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 One Thousand Dollars are 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 Laws, Chapter 149 Section 34 as most recently amended by Chapter 552 of the Acts of 1991).

Every contract, except for the purchase of material or supplies, involving the employment of laborers, workmen, mechanics, foremen or inspectors, to which the commonwealth or any county or town, subject to section thirty, is a party, shall contain a stipulation that no laborer, workman, mechanic, foreman or inspector working within the commonwealth, in the employ of the contractor, subcontractor or other person doing or contracting to do the whole or a part of the work contemplated by the contract, shall be required or permitted to work more than eight hours in any one day or more than forty-eight hours in any one week, or more than six days in any one week, except in case of emergency, or, in case any town subject to section thirty-one is a party to such a contract, more than eight hours in any one day, except as aforesaid, provided, that in contracts entered into by the department of highways 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, may employ laborers, workmen, mechanics, foremen and inspectors for more than eight hours in any one day in such construction or reconstruction when, in the opinion of the commissioner of labor and industries, public necessity so requires. Every such contract not containing the aforesaid stipulation shall be null and void.

Article 8. WORK BY FOREIGN CORPORATIONS
(General Laws, Chapter 30 Section 39L, as most recently amended by Chapter 3 of the Acts of 1967).

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

END OF SPECIAL CONDITIONS

SECTION 23 00 00

HEATING, VENTILATING AND AIR CONDITIONING

PART 1 - GENERAL

1.1 PROVISIONS INCLUDED

A. The Conditions of the Contract including Part A of the Project Manual and Division 1 – General Requirements, apply to the Work under this section.

1.2 SCOPE OF WORK

A. The work described herein shall be interpreted as work to be done by the HVAC Contractor. The HVAC Contractor shall be the General Contractor.

B. The work covered by this Section of the Specifications includes the furnishing of all labor and materials and in performing all operations in connection with the installation of the HVAC work.

C. The work includes, but is not limited to, the following:

1. Packaged Rooftop Units.
2. Gas piping to new rooftop units.
3. Variable Refrigerant Systems (VRF).
4. DX Split Systems (Indoor Air Handling Unit and Outdoor Air-Cooled Condensing Unit).
5. Sheet Metal Ductwork.
6. Grilles, Registers and Diffusers.
7. Refrigerant Piping.
8. Condensate Drain Piping and Pumps.
9. Piping Insulation.
10. Equipment Insulation.
11. Ductwork Insulation.
12. Automatic Temperature Controls.
13. Testing, Adjusting and Balancing (Coordination and Access).
14. O&M Manuals.
15. Operating Instructions.
16. Record Drawings.
17. Staging, Ladders, Scaffolding, Hoists and All Related Equipment.
18. Excavation, backfill and patching.
19. Masonry and concrete work. (Concrete housekeeping pads)
20. Finish painting, including painting of supporting steel for mechanical equipment.
21. Cutting and Patching.
22. Flashing and waterproofing of all pipe penetrations through walls.
23. Coring.
24. Installation and flashing of roof curbs furnished under this section.
25. Flashing and waterproofing of all new pipe and ductwork penetrations through roof.
26. Chain-link Fence (for new Condensing Units at grade).
27. Roof piping supports (for piping located on the roof.)
28. Roof guards (for walkways within 10’ of roof edge)
29. Roof walkway pads.
30. Roof crossover stairways (for unit access).
31. Security Fence (for Outdoor Units)

32. Sarnafill Roofing Penetrations (By Certified Sarnafil Contractor).
33. Firestopping at all penetrations.

1.3 RELATED WORK UNDER OTHER SECTIONS

A. The following work is not included under this Section and shall be performed under the Sections indicated:
1. By the Electrical Subcontractor:
a. The Electrical Subcontractor shall wire the smoke detectors furnished with the rooftop units on both the supply and return ductwork (interior to the unit) to the building fire alarm system. HVAC Contractor shall provide control wiring to the fan motor as required if not furnished with the smoke detectors as part of the unit package.
b. All power wiring required for the automatic temperature control system shall be installed by the Electrical Subcontractor. The Electrical Subcontractor, at a minimum, shall provide a 120-volt power junction box in the Office/IT Room 206 as shown on the mechanical/electrical drawings for the automatic temperature control system. HVAC contractor shall review with the Electrical Subcontractor if additional 120-volt power is required. Automatic temperature control wiring shall be provided by the HVAC Contractor under Division 23.
c. All electrical power wiring and connections and all disconnect switches not provided with or as integral part of the HVAC equipment shall be provided by the Electrical Subcontractor.
d. Motor starters and VFDs shall be furnished and installed by the HVAC Contractor and wired by the Electrical Subcontractor.
e. Refer to Electrical specification for more information.
2. By the Licensed Plumber:
a. Gas piping to new rooftop units.

1.4 CODES ORDINANCES AND PERMITS

A. All material and work provided shall be in accordance with the following codes and standards:
1. Massachusetts State Building Code.
2. State Department of Public Safety.
3. Local Codes.
4. Standards of the Underwriters Laboratories (UL).
5. Occupational Safety and Health Act (OSHA).
6. National Fire Protection Association (NFPA).
7. Massachusetts and National Electrical Codes.
8. International Mechanical Code (IMC) 2015.
9. International Energy Conservation Code (IECC) 2018.
10. International Plumbing Code.
11. National Fuel Gas Code (2012 Edition).

B. Where the contract documents indicate more stringent requirements than the above codes and ordinances, the Contract Documents shall take precedence.

C. All necessary inspections, and approvals are to be obtained and paid for by this contractor. All permit fees shall be waived by the Town of Wareham.

1.5 CONTRACT DRAWINGS AND SPECIFICATIONS

A. The drawings showing layout of the HVAC systems indicate the approximate location of piping, ductwork, equipment and location of services. They are schematic and are not intended to show the exact routing or all fittings required. The final determination as to the routing shall be governed by structural conditions and other obstructions. No cutting or removal of any wood or concrete members will be allowed, unless approved in writing by the Architect.

B. The right to make any reasonable change in the location of ducts, piping, apparatus and equipment up to the time of roughing-in is reserved by the Architect without involving any additional expense to the Owner.

C. The specifications supplement the drawings and provide specifics pertaining to the methods and material to be used in the execution of the work.

D. Any discrepancies between the drawings and specifications or within the drawings/specifications shall be brought to the attention of the Architect/Engineer for clarifications.

E. The HVAC Contractor shall read and understand the Contract Documents and submit the bid in accordance therewith. Failure to examine the Contract Documents and site plans shall not relieve the HVAC Contractor from any obligation under the bid as submitted.

1.6 SHOP DRAWING AND MATERIALS SCHEDULE

A. Within fifteen days after the date of notice to proceed and before purchasing any materials or equipment, submit for approval a complete list, in six copies, of all materials to be incorporated in the work. After the list has been processed, submit complete shop drawings of all equipment. These shop drawing submittals shall be submitted within fifteen days after the processing date of the original submittal list.

B. The approval of equipment does not relieve the HVAC Contractor from the responsibility for shop drawing errors in details, sizes, quantities, wiring diagram arrangements and dimensions which deviate from the specification, contract drawings and/or job conditions as they exist.

C. Refer to General Requirements for substitution of equipment and submittal of shop drawings. If apparatus or materials are substituted for those specified and such substitution necessitates changes in or additional connections, support or construction, same shall be provided. The HVAC Contractor shall assume cost and entire responsibility thereof.

D. Submit the name(s) and contact information for a minimum of two qualified vendors that are eligible to provide operations and maintenance on the installed HVAC system.

1.7 COOPERATION AND COORDINATION WITH OTHER TRADES

A. The work shall be so performed that the progress of the entire building construction including all other trades, shall not be delayed nor interfered with. Materials and apparatus shall be installed as fast as conditions of the building will permit and must be installed promptly when and as desired.

B. Confer with all other trades relative to location of all apparatus and equipment to be installed and select locations so as not to conflict with work of other Sections. Any conflicts shall be referred immediately to the Architect/Engineer for decision to prevent delay in installation of work. All work and materials placed in violation of this clause shall be readjusted to the Architect's/Engineer's satisfaction, at no expense to the Owner.

C. Where work of this section will be installed in close proximity to work of other sections or where there is evidence that the work of this section will interfere with work of other sections, assist in working out space conditions to make satisfactory adjustment. Prepare and submit for approval 3/8-inch scale or larger working drawings and sections, clearly showing how this work is to be installed in relation to the work of other sections. If the work of this section is installed before coordinating with other trades or so as to cause interference with work of other trades, make changes necessary to protect conditions without extra charge.

D. Keep fully informed as to the shape, size and position of all openings required for all apparatus and give information in advance to build openings into the work. Furnish and set in place all sleeves, pockets, supports and incidentals.

E. All distribution systems which require pitch or slope such as sanitary drains and water piping shall have the right of way over those which do not. Confer with other trades as to the location of pipes, ducts, lights and apparatus and install work to avoid interferences.

F. Where there is evidence that work of this Contractor will interfere with the work of other trades, this Contractor shall assist in working out space conditions to make satisfactory adjustments.

G. This Contractor shall, with the approval of the Engineer and without extra charge, make reasonable modifications in their work as required by structural interference's, or by interference with work of other trades, or for proper execution of the work.

H. If this Contractor installs their work before coordinating with other trades and their work causes interference with the work of such other trades, they shall make all necessary changes in their work to correct the condition without extra charge and as directed by the Engineer.

I. This Contractor shall protect all materials and work of other trades from damage that may be caused by their work and shall make good any damages so caused.

1.8 RECORD DRAWINGS

A. Provide two sets of black line prints to be used as working record drawings during construction. One set of prints shall be maintained at the job site and shall, at all times, be accurate, clear and complete, showing the actual location of all equipment, ducts and piping. The working record drawings shall be available for review at the job site by the Architect's/Engineer's field representative. The marked up As Built Drawings required to be maintained under this section are Drawings: P-1, M-1, M-2, M-3, M-4, M-5 & M-6.

B. Any addenda sketches, supplementary drawings and change order issued during the course of construction shall be transferred to the working record drawings.

C. At the completion of all work submit an accurate, checked set of working record drawings. Non-availability of these drawings will postpone the final inspection until the record drawings are available.

D. The HVAC Contractor shall incorporate all changes on the original drawings. The Contractor shall submit to the designer, disks of drawings on AutoCAD Version 2013 format with two sets of prints and reproducible drawings. Inaccuracies in Record Drawings, as determined by the designer, shall be corrected.

E. All costs related to these requirements shall be paid for by the HVAC Contractor.

1.9 OPERATING INSTRUCTIONS AND MAINTENANCE MANUALS

A. Provide operating instructions to the Owner's designated representatives with respect to operating functions and maintenance procedures for all equipment and systems installed. The cost of providing a manufacturer's representative at the site for instructional purposes shall be included in the contract price. The operating instructions shall be presented in scheduled, pre-arranged formal periods. The HVAC Contractor shall include in their contract price, the cost for instructions, up to ten (10) hours, which shall not necessarily be consecutive.

1. Documentation: Submit documents for all training materials including as listed below.
    a. Provide a training manual for facilities staff. Provide a copy of training materials, training date, and attendee list for initial facilities staff training session(s).
    b. Provide training materials for administrative staff.
2. Contractor Responsibilities:
    a. Provide designated Owner personnel with comprehensive orientation and training in the understanding of the systems and the operation and maintenance of each piece of equipment including, but not limited to, all HVAC equipment (ex. Packaged Rooftop Units, Outdoor Air-Cooled Condensing Units, Indoor Units, etc.)
    b. Training shall normally start with classroom sessions followed by hands-on training on each piece of equipment, which shall illustrate the various modes of operation, including startup, shutdown, fire/smoke alarm, and power failure.
    c. During any demonstration, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system will be repaired or adjusted as necessary and the demonstration repeated.
    d. The HVAC contractor or manufacturer's representative shall provide the instructions on each major piece of equipment. This person may be the start-up technician for the piece of equipment, the installing contractor or manufacturer's representative. Practical building operating expertise as well as in-depth knowledge of all modes of operation of the specific piece of equipment are required. More than one party may be required to execute the training.
    e. The controls contractor shall attend sessions other than the controls training, as requested, to discuss the interaction of the controls system as it relates to the equipment being discussed.
    f. The training sessions shall follow the agendas submitted and approved by the team.
3. Training Shall Include:

a. Use of the printed installation, operation and maintenance instruction material included in the O&M manuals.
b. A review of the written O&M instructions emphasizing safe and proper operating requirements, preventative maintenance, special tools needed and spare parts inventory suggestions. The training shall include start-up, operation in all modes possible, shut-down, seasonal change over and any emergency procedures.
c. Discussion of relevant health and safety issues and concerns.
d. Discussion of warranties and guarantees.
e. Common troubleshooting problems and solutions.
f. Explanatory information included in the O&M manuals and the location of all plans and manuals in the facility.
g. Discussion of any peculiarities of equipment installation or operation.
h. Hands-on training shall include start-up, operation in all modes possible, including manual, shut-down and any emergency procedures and preventative maintenance for all pieces of equipment.
1) The HVAC Contractor shall fully explain and demonstrate the operation, function and overrides of any local packaged controls, not controlled by the central control system or Building Management System (BMS).
2) Training shall occur after functional testing is complete, unless approved otherwise by the Owner.

4. Training Scope:
a. HVAC equipment locations and areas served.
b. Operational/Design intent of equipment and interactions with other equipment or systems.
c. Equipment operations; Start-up, Shutdown and Normal operations.
d. Provide DOC system training including Detailed sequence of operations.
e. Review of system drawings and schematics.
f. Preventative Maintenance and replacement part sources.
g. O&M Manual review.
h. Questions and Answers.

B. Maintenance Manuals:
1. At the completion of the project, turn over to the Architect/Engineer, two complete manuals containing the following:
a. Complete shop drawings of all equipment.
b. Operation descriptions of all systems.
c. Names, addresses and telephone numbers of all major suppliers of equipment on a separate indexing sheet.
d. Preventative maintenance instructions for all equipment.
e. Spare parts list of all system components.
2. The Contractor shall collect the operating instructions, bind them into two complete sets and deliver them to the Architect/Engineer who will check for completeness and deliver them to the Owner. All information shall be in three-ring, loose-leaf binders.
3. Delivery of the operating and maintenance manuals shall be a condition precedent to final payment.

1.10 GUARANTEE

A. This Contractor shall obtain, in the Owner's name, the standard written manufacturer's guarantee for one year or greater of all materials furnished under this section where such guarantees are offered in the manufacturer's published product data. All these guarantees shall be in addition to, and not in lieu of, other liabilities which this Contractor may have by law or other provisions of the contract documents.

B. This Contractor shall warranty workmanship and materials for a period of not less than one year from the date of substantial completion. Should any defects in materials or workmanship appear during this period, they shall be corrected or replaced by the Contractor to the satisfaction of the Architect, and at no expense to the Owner.

1.11 CUTTING, CORING AND PATCHING

A. Cutting and patching through new construction using core drill and measuring larger than 4-1/2 inches in diameter, or 4-1/2 inches by 4-1/2 inches, shall be performed by Trades specializing in the specific surfaces affected, e.g., carpentry, masonry, metals, roofing, except where noted otherwise. Notify the specific Trade(s) of exact locations and sizes for openings required. The extent of masonry walls is shown on the architectural drawings. This Section's Contractor is responsible for reviewing and coordinating with other sub-contractors.

1. Exposed concrete coring: Notify Contractor of exact locations and sizes for all openings required in exposed concrete.
2. Concrete coring less than 4-1/2 inches: Any new penetration cut through concrete less than 4-1/2 inches in width shall be executed by the specific Trade(s) installing the work.
3. Concrete coring 4-1/2 inches or larger: Notify Contractor of exact locations and sizes for openings larger than 4-1/2 inches in diameter required in concrete.
4. Masonry openings less than 4-1/2 inches: Any new penetration cut through masonry less than 4-1/2 inches in width shall be executed by the specific Trade(s) installing the work.
5. Masonry openings 4-1/2 inches or larger: Notify Contractor of exact locations and sizes for openings larger than 4-1/2 inches in width required in masonry.
6. Exposed gypsum board: Notify Contractor of exact locations and sizes for all openings required in exposed gypsum board.
7. Concealed gypsum board: Any new penetration cut through concealed gypsum board less than 4-1/2 inches in width shall be executed by the specific Trade(s) installing the work. Cutting and patching larger than 4-1/2 inches in diameter, or 4-1/2 inches by 4-1/2 inches.
8. Notify Engineer prior to any cutting or coring larger than 2 inches.

1.12 PERMITS

A. This Contractor shall be responsible for obtaining the permits and the Town shall waive all permits fees. This Contractor shall be responsible for obtaining and paying for all inspections required to complete all work described in this section. Refer to Division 1 specifications for more information. This Contractor shall be responsible for paying for all re-inspections required.

1.13 STORAGE OF MATERIALS

A. Store materials prior to their installation where designated by the Owner or Authority. This Contractor shall be responsible for all stored equipment and materials and protect all installed equipment and materials from damage.

1.14 INSPECTION AND TESTS

A. If inspection of materials installed shows defects, such defective work, materials and/or equipment shall be replaced at no cost to the Owner and the inspection and tests repeated.

B. This Contractor shall make all reasonable tests as required and prove the integrity of all work and leave the entire HVAC installation in correct adjustment and ready to operate.

1.15 ELECTRICAL CHARACTERISTICS

A. In general, and unless specifically indicated otherwise in the specifications or noted on the drawings, all HVAC equipment shall be of the HP, voltage, and phase as indicated on the drawings.

B. Control wiring and conduit for the HVAC systems shall be furnished under this Section. Power wiring, including provisions for disconnect switches not otherwise furnished as an integral part of the mechanical equipment, is under the work of the Electrical Subcontractor.

C. Fractional horsepower motors wired for single phase operation shall have automatic reset overload protection built into the motor.

1.16 DEFINITION OF TERMS

A. "Furnish" or "Supply" means to purchase, procure, acquire and deliver.

B. "Install" means to rig, erect, mount and connect, unless specifically noted otherwise.

C. "Furnish and Install" means to supply, deliver, rig, erect, mount and connect in readiness for operation, unless specifically noted otherwise.

D. "Provide" is synonymous with "Furnish and Install".

E. "Piping" means pipe, tubing, fittings, flanges, unions, valves, strainers, traps, hangers and other accessories related to such piping.

F. "Concealed" means hidden in chases, furred spaces and walls, above ceilings or enclosed in construction.

G. "Exposed" means visible or not installed "Concealed" as defined above.

H. "Approved Equal" or "or equal" means any equipment or material which is approved by the Engineer as equal in quality, durability, appearance, strength, design and performance to the equipment or material originally specified.

I. "Underground" means buried exterior to or within the building.

1.17 SCAFFOLDING AND STAGING

A. All staging, exterior and interior, required to be over eight feet in height, shall be furnished and erected by this Contractor and maintained in safe condition by him without charge to and for the use of all trades as needed by them for proper execution of their work, except where specified to the contrary in any filed sub-bid Section of the Specification.

1. Erection and dismantling of staging shall be performed only by trained, certified, and experienced staging personnel qualified to perform such work.
2. Copies of such certifications, clearly indicating qualifications, shall be provided to the Architect prior to commencement of such erecting and dismantling work.

B. Provide, maintain and remove safe and adequate interior and exterior staging, ladders, scaffolding, hoists, and all other related equipment for proper and complete execution of the work of this section in accordance with requirements of the Contract Documents. Staging, scaffolding, hoists and all other related equipment shall comply with all applicable federal, state and local regulations.

C. Staging, ladders, scaffolding, hoists and all other related equipment shall be provided, maintained and removed when no longer required.

1.18 WORK COORDINATION AND JOB OPERATIONS

A. HVAC equipment shall not be installed in congested and possible problem areas without first coordinating the installation of same with the other trades. Relocate HVAC equipment should it interfere with the proper installation of equipment to be installed by the other trades.

B. Particular attention is directed to the coordination of ductwork with the equipment of other trades being installed in and above the ceiling areas. Conflicts in mounting heights and clearances above hung ceilings shall be brought to the attention of the Architect for a decision before equipment is installed.

C. Furnish to the other trades, all information relative to the portion of the HVAC installation that will affect them, so that they may plan their work and installations accordingly.

1.19 REBATES

A. The HVAC Contractor shall assist the Owner in obtaining all eligible utility rebates and transferring these rebates to the Owner pertaining to this section.

1.20 DESCRIPTION OF WORK

A. All of the Contract Documents, including Drawings, General Conditions, Supplementary Conditions, and all Sections of Division 01 – General Requirements, apply to the Work of this Section.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

A. Condensate Drain:

1. PVC Piping: Condensate drain piping shall be Schedule 40 PVC with solvent joints. Provide P-trap for each condensate drain line connection. Provide clean-outs at each change in direction of piping. Use tees and a 45-degree fitting for a branch line joining a main. Clean-outs shall be made with threaded plug tees. Pitch piping down in direction of flow.
2. Condensate drain from roof-top units shall not be less than 1-1/4" diameter PVC and shall be extended to roof drains.
3. Line-Hide as manufactured by Mitsubishi, Diversitech, DuctlessAire, or approved equal shall be provided for exposed condensate drain piping.

B. Refrigerant Piping:

1. Rigid Copper Refrigerant Pipe: ASTM B819, type #ACR hard drawn or annealed with ASME B16.22 wrought copper fittings. Material shall be Type ACR hard drawn copper tubing with silver solder wrought copper fittings. Tubing shall be specially cleaned and capped for use with refrigerants. Piping shall be sized as recommended by the manufacturer.
2. Pre-insulated line sets: At the discretion of the HVAC Contractor, manufacturer approved pre-insulated line sets may be used. Lines shall be hung to avoid sagging. Do not allow lines to lay on ceiling system. Pre-Insulated line sets shall be sized and have an insulation thickness as recommended by the equipment manufacturer.
3. Line-Hide as manufactured by Mitsubishi, Diversitech, DuctlessAire, or approved equal shall be provided for exposed refrigerant piping.

C. Gas Piping (By Licensed Plumber):

1. All piping, fittings, and accessories shall be approved for use in Massachusetts in accordance with 248CMR.
2. It shall be the responsibility of this Contractor to ensure that all items submitted to the Engineer to be installed in association with this Work comply with all requirements of 248CMR.
3. Approval by the Engineer of items submitted does not relieve this Contractor from the responsibility of complying with the requirements of 248CMR.
4. Installed items which do not meet the requirements of 248CMR shall be removed and replaced with approved products by this Contractor at no additional cost.
5. Gas and gas train vent piping shall be Schedule 40 steel or wrought iron, complying with ANSI Standard B36.10, ASTM A53 or ASTM A106. Fittings shall be threaded malleable iron complying with ASME B16.3. All gas pipe 3" and larger shall be welded. Welding outlet fittings shall conform to ASTM A53. Condensate/sediment traps shall be installed at all points in accordance with the requirements of all applicable Codes, and at the gas inlet of each piece of gas-fired equipment.
6. Joining of steel or wrought iron pipe to dissimilar metals shall be accomplished using dielectric, brass or stainless-steel fittings. The use of a dielectric may require the installation of a bonding jumper between the two metallic pipes. The bonding jumper shall be sized and installed by a licensed electrician.

D. Gas System Valves (By Licensed Plumber):

1. Gas shutoff valves shall be furnished and installed at the connection to each piece of equipment, at each riser, and where shown on the Drawings.
2. Gas shutoff valves 2" and smaller shall be brass, of the full-port ball type, with stops and lever handle.
3. Gas shutoff valves used for pressures greater than ½ psig or which are 2½" or larger shall be brass, of the lubricated plug type, with stops and tee handle.
4. Gas shutoff valves shall be UL listed.
5. Gas shutoff valves serving emergency generators shall be installed downstream of the meter set and upstream of any other gas shutoff valves, allowing the gas supplies to be operated independently. The gas shutoff valve serving the generator shall be provided with a metal sign which reads: "WARNING:

Emergency Power Generator for Life Safety Systems. Do not shut off without the approval of appropriate authorities".

E. Fittings & Couplings:

1. Fittings for piping 2-1/2" diameter and larger shall be standard welding fittings as manufactured by Tube-Turns, Grinnell, Crane or approved equal. Elbows shall be long radius elbows. Branch connections reducing two sizes or less shall be made with welding tees of the same manufacturer as the fittings. Branch connections reducing more than two sizes shall be made with weldolets, threadolets, or with welding tees. Unless otherwise indicated or approved, all reduction in pipe size shall be made with eccentric reducers. Flanges shall be 150 pound weld neck flanges.
2. Screwed fittings shall be 125-pound cast iron fittings. Unions shall be 150-pound ground joint units. All reducers shall be eccentric reducers.
3. Provide dielectric fittings for all connections between ferrous and non-ferrous piping.
4. Copper Fittings:
   a. Fittings for copper tubing shall be wrought copper fittings.

2.2 PIPING SYSTEMS IDENTIFICATION

A. A. All new piping and existing piping located in the Work area shall be identified as to contents and direction of flow in intervals not exceeding ten (10) feet, at each change in direction, and on both sides of penetrations through walls, floors, and/or ceilings.

B. B. All systems identification materials shall meet ANSI standard A13.1-1996 and be as manufactured by Seton Name Plate Corporation or approved equal.

C. C. Valve tags shall be circular 19 gauge brass, 1½" in diameter, with black filled text Seton No. M4506 with No. 16197 brass hooks, No. 16182 bass jack chain, or No. 6 nickel-plated bead chain. Letter abbreviations shall be 1¼" high above ½" high numbers. Provide three (3) laminated valve tag charts indicating valve number, valve location, pipe contents, and equipment or area served.

D. D. Pipe markers shall be "Setmark" type pre-molded acrylic plastic, snap on markers either 8" or 12" long with overlap, as manufactured by Seton or approved equal. The background, field and legend colors and letter sizes shall be per ANSI A13.1.

E. E. All equipment furnished under this contract shall be identified by approved nameplates provided by this Subcontractor.

1. 1. The nameplates shall be aluminum, minimum 2-1/2" x 3/4" in size, with a black background with etched or engraved natural aluminum lettering. The nameplates shall bear notations corresponding to the same unit notations indicated on the design drawings, or as requested by the Owner in lieu thereof.

2. 2. All nameplates shall be mounted in a conspicuous location on the exterior of the equipment.

2.3 BOLTS, GASKETS AND JOINTS

A. All screwed joints shall be made tight with teflon tape.

B. All flanges shall be faced and drilled to US Standards and fitted with machine bolts of proper number and size, having semi-finished hexagon nuts and a washer under each nut. All flanged joints shall be fitted with Johns-Manville Service, Cranite or Durable ring gaskets.

C. All solder joints shall be made with 95-5 solder and shall make perfect adhesion between pipe tubing and fitting.

D. Provide dielectric fittings for all connections between ferrous and non-ferrous piping.

2.4 HANGERS AND SUPPORTS

A. Provide pipe supports, hangers, and other devices necessary to support firmly and substantially the piping and the apparatus described in the specifications and shown on the drawings. Hangers shall be arranged to maintain the required grading and pitch, to prevent vibration, and to provide for expansion and contraction. All hangers and supports shall be in compliance with seismic requirements of the State Building Code.

B. Where the weight of piping or other apparatus makes it impracticable to support same from the ceiling alone, flange pipe standards shall be installed to support the weight of piping, valves and fittings.

C. Piping shall not be supported from ductwork, breeching, equipment, ceiling suspension systems or other piping.

D. Brackets of approved type may be used along walls.

E. Each vertical line shall be supported at its base using a suitable hanger placed in the horizontal line near the riser.

F. Piping 2-inch diameter and smaller shall be supported by "A" bands with adjustable steel rod with concrete insert or beam clamp. Piping 2-1/2 and above diameter shall be supported by clevis hangers with adjustable steel rod and one concrete insert or beam clamp. Two rod roll hangers shall be used in lieu of the hanger type specified where space limitations necessitate.

G. 1A bands and clevis hangers shall be installed outside the thermal insulation. Provide 18 gauge, 12” long pipe covering protection shields on insulated piping at 1A bands and clevis hangers. Provide galvanized metal shields between pipe hangers and insulation where saddles are not required and where hangers are installed outside of insulation.

H. The maximum spacing between pipe supports shall be in accordance with the latest addition of ANSI/MSS SP-69 & SP-58 Tables 3 & 4. The following excerpts from the tables shall be verified prior to work.

1. Horizontal Copper Pipe:

Nominal Pipe Size (in)	Rod Diameter (in)	Maximum Spacing (ft)
1/4 – 3/4	3/8	5
1	3/8	6
1-1/4	3/8	7
1-1/2	3/8	8
2	3/8	8
2-1/2	1/2	9
3	1/2	10
4	1/2	12

2. These spans apply to straight runs of piping without concentrated loads. Spans shall be shorter as required by changes in direction or by concentrated loads such as strainers, valves, or related items. Supplementary steel shall be furnished and installed as required by ANSI/MSS SP-58.

3. Roof piping supports: Provide corrosion resistant rooftop pipe supports suitable for installation on the roof as specified. The supports shall be designed to support plumbing gas piping, be UV resistant, and be

capable of supporting and securing in place the indicated piping. Supports shall be MIFAB C-Port or equivalent by Anvil, Eaton, PHD, or approved equal.

2.5 EXPANSION LOOPS, OFFSETS AND ANCHORS

A. Provisions for expansion in mains and risers shall be made by the installation of offsets or pipe loops.

B. All expansion loops and offsets shall be constructed as shown on the drawings or as required. All mains and risers having expansion loop or offsets shall be securely anchored to the building construction in such a manner as to throw all expansion toward the expansion loops or offsets. Furnish and install guides as necessary to properly fulfill the function of expansion loops.

2.6 SLEEVES, INSERTS AND ESCUTCHEONS

A. All piping passing through masonry walls, slabs, floor partitions or other building construction shall be provided with pipe sleeves at least two pipe sizes larger than the pipe passing through them or the insulation jacket on covered pipes. Sleeves shall be flush on either side of masonry walls or partitions. All sleeves in floor slabs shall extend ½" above finished floors. All sleeves shall be standard weight steel pipe.

B. Where exposed pipes pass through floors, finished walls or finished ceilings, they shall be fitted with neat, heavy spun or stamped steel, chrome plated escutcheons, firmly secured to the pipes. In unfinished areas, escutcheons shall be cast iron, split and painted to match the adjacent surfaces. Escutcheons shall be of sufficient outside diameter to amply cover the sleeved openings for the pipe.

C. Where pipes penetrate fire rated assemblies, walls or floors, openings shall be firestopped. At all partition penetrations, walls or floors, openings shall be firestopped per the requirements of Section 3.10.

2.7 SHEET METAL DUCTWORK

A. Furnish and install, in an approved manner, all sheet metal work that is indicated on the drawings or that is specified or required for the various systems of heating, ventilation, air conditioning, return air and exhaust air.

B. All sheet metal work shall be manufactured and erected in a first class and workmanlike manner, in accordance with the Duct Manual of the Sheet Metal and Air Conditioning Contractors National Association, Inc. and shall be approved by the Architect. All ducts, unless otherwise approved, shall be true to the dimensions indicated on the plans and shall be straight and smooth on the inside with neatly finished joints. The ducts shall be securely anchored to the building construction in an approved manner and shall be so installed as to be completely free from vibration under all conditions of operation. All ducts shall be supported in accordance with requirements of Plate Numbers 18, 19 and 20 of the SMACNA Duct Manual.

C. All slip joints for low velocity rectangular ducts shall be made in direction of air flow and, unless otherwise indicated on the plans, all elbows shall have long turns with the inside radius no less than the plan dimension of the duct. Where short radius elbows or square corner elbows are used, they shall be fitted with turning vanes. All notches for connecting sections of duct and all governing seam notches shall not be cut any deeper than necessary to insure tight corners. Any notched corners not meeting with approval shall be removed and reinstalled or sealed with solder.

D. Install and seal ducts in accordance with SMACNA HVAC Duct Construction Standards – Metal and Flexible. The ductwork shall be sealed to provide a SMACNA Seal Class A installation. All transverse seems, longitudinal seems, joints, and duct penetrations shall be sealed with water-based vinyl copolymer mastic formulated to withstand temperature from -20EF to +150EF. Sealant shall have a temperature UL Classification with a flame spread of 25 or less and smoke developed of 50 when tested in compliance with ASTM-E-84-87. Duct sealants shall be in compliance with LEED VOC off gassing requirements 250 g/l or less permitted.

E. Unless otherwise specified, all rectangular ducts shall be of the best bloom galvanized steel of the U.S. Standard gauges specified below and shall be stiffened by cross breaking and by use of galvanized rolled steel angles as specified below:

Rectangular	Gauge	Galvanized Iron	
Sizes	No.	Angle Stiffeners	Center Spacing
Up to 14"	26	Standing Seams	

15" to 30"	24	Standing Seams	Not Greater Than 33"
31" to 60"	22	1" x 1" x 3/16"	Not Greater Than 33"
61" to 84"	20	1-1/2"x1-1/2"x3/16"	Not Greater Than 33"

F. All rectangular sheet metal ductwork, unless otherwise specified, shall be constructed with longitudinal Pittsburgh Lock seams thoroughly flattened down to make a tight joint. Transverse joints shall be made up with slip joints and standing lock seams. Branches to and from the main trunk shall be made at an angle but shall, in no case, exceed 45º to the line of air flow.

G. The exact locations of all ducts to be installed above the ceilings shall be agreed upon among the mechanical trades under the supervision of the General Contractor before work is fabricated or installed. In general, the plumbing piping shall be given the right of way owing to pitch requirements and the HVAC Contractor shall raise or lower his ducts to clear the plumbing piping.

H. All openings in building construction surrounding transversing ducts shall be sealed with mineral wool or other non-combustible material to prevent the passage of flame or smoke. Maintain rating of assembly as shown on architectural plans.

I. Duct Sizes: All duct sizes indicated on the drawings are inside dimensions of either the bare metal or the sound insulation where specified. Where sound insulation is specified for installation, the sheet metal ducts shall be increased in size to provide the free area inside the sound insulation called for on the drawings.

J. Flexible Duct:

1. Furnish and install flexible ducts from sheetmetal ducts to supply outlets as indicated on the drawings.
2. Flexible ducts shall be fabri-flex coated fiberglass fabric ducts or approved equal. Flexible supply ducts shall be Fabriflex Type IV insulated ducts or approved equal with 1", 3/4 Lb. density insulation in a seamless polyethylene covered jacket.
3. Flexible ducts shall be installed in strict accordance with the manufacturer's recommendations. Lengths of flexible ducts shall not exceed 5 feet.

2.8 DUCTWORK ACCESSORIES

A. Furnish and install, in an approved manner, all ductwork accessories indicated on the drawings or that is specified or required for the various systems of heating, ventilation, air conditioning, return air or exhaust air. All work shall be manufactured and erected in a first class and workmanlike manner, in accordance with the Duct Manual of the Sheet Metal and Air Conditioning Contractors National Association, Inc. and shall be approved by the design team.

B. Volume Damper: Furnish and install where indicated on the drawings, where specified or where required. Provide in each branch runout to diffuser, register, or grille. Locate damper so as to be accessible or provide remote actuating mechanism.

1. Manual dampers: Provide with indicating and locking quadrants or push rods and pillow blocks. The dampers shall be two gauges heavier than the ducts in which they are installed. Damper blades shall be riveted to the surrounding rod. Case or malleable brackets riveted to the sides of the ducts shall be used to support the damper rod.

C. Flexible Connections: The inlet and outlet of each of the packaged rooftop units shall be connected to the ductwork by an approved flexible connection made of Ventfab as manufactured by Iden Associates, tightly secured to the fan inlet and outlet with metal bands. A minimum 4" space shall be maintained between the duct and fan connection and the flexible connection shall not be stretched tight

D. Duct Doors: Furnish access doors and frames for access to all concealed parts of the ductwork systems that require accessibility for the proper operation, maintenance and inspection of the system. The duct doors shall be manufactured by Buckley, Kees, Greenheck, Nailor, Ruskin, or approved equal.

1. Fabricate duct doors in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.
2. Fabrication: Rigid and close fitting of galvanized steel with sealing gaskets and quick fastening locking devices. Install minimum one inch (1") thick insulation with sheet metal cover for insulated ductwork.

a. Less than 12 Inch Square: Secure with sash locks.

b. Up to 18-inch Square: Provide two hinges and two sash locks.

c. Up to 24-inch x 48 Inches: Three hinges and two compression latches with outside and inside handles.

3. Access doors with sheet metal screw fasteners are not acceptable.

2.9 DIFFUSERS, REGISTERS AND GRILLES

A. Provide all diffusers, registers and grilles as scheduled on the drawings. The units shall be of the size, type and direction of flow noted on the drawings. Test and rate air outlet and inlet performance in accordance with ADC Equipment Test Code 1062 and ASHRAE 70. All registers and diffusers shall be furnished with individually adjustable volume control dampers. Diffusers, registers and grilles shall be as manufactured by Tuttle & Bailey, Krueger, Metal-Aire, Nailor, Price, Titus or approved equal and shall be complete with the finishes and accessories specified on drawings.

B. Coordinate the location of ceiling supply, return and exhaust outlets with the existing field conditions.

C. All registers shall have color selected by Owner. Contractor shall coordinate the color with the Owner prior to order. The units shall be factory painted the Owner's selected color.

D. Return registers shall be of steel construction with opposed blade dampers as scheduled on drawings (no damper for transfer grilles), 35-degree horizontal fixed bars maintaining an effective area capacity of greater than 75% and baked enamel finish.

E. Supply air registers shall be double deflection and aluminum construction and integral opposed blade dampers.

2.10 INSULATION

A. Provide pipe covering and duct insulation of the type hereinafter specified on the following: refrigerant piping and sheet metal ducts. All sealers, solvents, tapes, adhesives and mastics used in conjunction with this section of the specifications shall possess the maximum safety quantities available and shall conform to Standards #90A and #90B. Insulation shall be fiberglass except as specified hereinafter having a minimum density of four pounds per cubic foot. Insulation shall be as manufactured by Armstrong, CertainTeed, Johns-Manville, Knauf, Owens/Corning, or equal and installed in accordance with the manufacturer's recommendations.

B. Piping: All new piping and fittings throughout the building, as shown on the drawings, shall be insulated with Owens/Corning Fiberglass, or equal, 25 ASJ glass fiber insulation in molded sections. Glass fiber insulation shall have a minimum density of 3-1/4 pounds per cubic foot with a thermal conductivity ("K" value) range of 0.21-0.27 at 75ºF mean temperature. All piping shall have a factory applied all service vapor barrier jacket. The end joints of the insulation shall be sealed with factory furnished end joint sealing tape. Longitudinal seams shall be sealed with Benjamin Foster 85-75 adhesive. The thickness of insulation to be applied to piping shall be as follows:

1. All refrigerant suction lines shall be insulated with 1" wall thickness flexible elastomeric closed cell pipe insulation. All insulation exposed to the weather shall be furnished with two coats of Armstrong Armaflex finish or approved equal. Contractor shall provide on both the suction and liquid lines as recommended by the manufacturer. Flexible elastomeric cellular insulation shall be manufactured by Armstrong Armaflex, Aerocel3: K-Flex, or approved equal.

2. The end joints of insulation shall be tightly butted and covered with factory furnished end joint sealing tapes. The jacket overlap shall be sealed with an approved sealer which shall not mar the jacket finish. Staples shall not be used for fastening insulation.

3. All fittings, valves and flanges shall be insulated with the same thickness of fiberglass as on the piping, with mitered segments of pre-molded F/G fittings wired in place after which a one mil aluminum foil vapor barrier shall be wrapped tightly over the insulation with all laps sealed with the manufacturer's vapor seal mastic. Wet coats of vapor seal mastic with imbedded glass fabric shall be applied to fittings, per the manufacturer's recommendations. Staples or tacks shall not be used.

4. Provide PVC plastic pipe jacket over pipe insulation on exterior refrigerant piping. Jacket shall be 10 mil thickness, ASTM C921, sheet material, off-white color, ASTM E96; 0.002 perm-inches. Adhesives and mastic shall be compatible with insulation.

C. Ductwork: Provide duct insulation as specified and shown on the drawings. All insulation shall be Installed per manufacturer's recommendations.

1. All air conditioning supply air ducts and return air ducts above ceilings shall be insulated with 1-1/2" thick fiberglass insulation wrap with 0.0025" aluminum foil facing that has been tested in accordance with ASTM E-84, having a flame spread rating of 25 maximum and smoke developed rating of 50 maximum. Supply and return ducts above ceilings shall be insulated with not less than R-6 insulation.
2. Exterior supply and return ducts above the roof shall be insulated with 1" six-pound density rigid insulation, in addition to sound insulation, with EPDM rubberized membrane installed outside the insulation. Supply and return exterior ductwork shall be insulated with not less than R-12 insulation. Provide angle irons

2.11 CHAIN-LINK FENCE

A. General: Provide a new chain-link security fence around the new outdoor air-cooled condensing units located at grade. New chain-link security fence shall come with a door and shall be secured to the building, ground and shall be installed where noted on the drawings. New fence shall be constructed of galvanized steel.

B. Height: Chain-link fence shall be a minimum of 10 feet in height.

C. Gauge Size: Chain link fence and door shall be 11-guage.

D. Mesh Size: The diameter of the diagonal interior squares shall be 2" and shall be 11-guage.

E. Chain-link fence doors shall be of the size applicable to allow for maintenance staff and tools through without incident.

F. Contractor shall coordinate new locations of fencing with the Owner before installation.

G. Attach gates to the gate posts by method standard with the manufacturer.

H. Install gates plumb, level, and secure for full opening without interference.

I. Gate hardware shall be manufacturer's standard products. Hang and secure gates in such a manner that, when locked, they cannot be lifted off hinges.

1. Arrange latches for locking. Keepers shall consist of a mechanical device for securing the free end of the gate when in full open position.
2. Equip all gate openings with a padlock, keyed as directed by the owner. Padlocks shall have chains that are securely attached to the gate or gate post.
3. Adjust hardware for smooth operation and lubricate where necessary.

J. Where utilities exist, excavation for installation of fence posts shall be carefully dug by hand only. Machine excavation, auguring or pounding in posts will not be allowed where buried utilities are in the area.

2.12 ROOFTOP STAIRS

A. General: A secured rooftop stair shall be installed to allow access to rooftop units. These stairs shall be secured completely and fully in the roof and shall allow access over the new ductwork. Stairs shall be installed where shown on the drawing. Stairs shall be manufactured by "Erect-a-step", PHP Systems/Design, Upside Innovations or engineer approved equal.

B. Platforms:

1. Platforms shall be constructed of 6063 aluminum and shall consist of:
    a. Pre-engineered and prefabricated 36"x36" in size and must be made in the USA with associated "Made in the USA" stamp.
    b. The platform shall be constructed with a stamped positive-traction walking surface.
    c. Units will have common bolt hole patterns on all four platform sides.

C. Stair:

1. Stair base 3 thru 6-step stairs designed to be connected together totaling up to 15 steps.
2. Shall be prefabricated 26" wide stamped positive traction surface with 3/16 5052 aluminum H32 5 gauge punched positive tread made of aluminum.

3. Shall be prefabricated to fit any side of a modular platform.
4. Shall have handrails on both sides that are powder coated pipe coated construction Safety Yellow and shall be connectable to 3-6 step stair units.

D. Handrail:
1. Handrails shall consist of universal nut plate insert to bolt to any side of the platform.
2. Shall be prefabricated to fit a 36" side of a platform.
3. Shall have a 1.9" outer diameter pipe aluminum construction powder coated.
4. Shall be made out of 1-1/2 square schedule 10 aluminum pipe 6061/6063 aluminum, mid-rail is 1" schedule 40/6063, kick plate ¼ square 5052 aluminum.

E. Stairs shall be a width of 44" and shall have railings on each open side.
1. Railings shall meet all OSHA requirements

F. Stairs shall have a riser height of 9.5".

G. Stairs shall have a tread depth of minimum of 9.5".
1. Treads must support greater than or equal to 1000 lbs.

H. Stairs shall meet all OSHA requirements and shall be provided with a platform over the ductwork. All items of this stairway shall meet all OSHA requirements.
1. If the platform is higher than 4' it shall require guardrails – guardrails shall meet all OSHA requirements.
2. Platforms must be greater than or equal to the width of stairs and shall be greater than 30" deep.

I. Stairs, platforms, railings and guardrails shall meet the requirements of OSHA.

J. A certified drawing from this Contractor shall provide all information as to location, securing of the stair to the roof and all pertinent OSHA requirements in compliance for review and approval before purchase and installation.

K. All design standards shall be in accordance with:
1. OSHA 1910 Standards.
2. Designed per the Aluminum Design manual 2015 Edition.

L. Handrails shall receive the 3- coat paint (SSPC-SP10) used in highly corrosive areas due to proximity to the ocean. See below for more information:

3 - COAT PAINT SYSTEM (SSPC-SP10) Used in Highly Corrosive Areas				
Manufacturer's Code	Generic Type	Minimum Dry Film Thickness (DFT)/Coat	Number of Coats	Color
Sherwin Williams Phenicon HS	Epoxy Phenolic	7 Mils	2	See Section 7
Handrail to receive an additional 3 mils of Amercoat 450; Color: Safety Yellow				

2.13 FREE-STANDING ROOF GUARD SYSTEM

A. The free-standing roof guard system shall be of the "non-penetrating" style as manufactured by Eberl Iron Works model RTS or engineer approved equal.

B. The free-standing roof system shall be installed where equipment is located within 10 feet of a roof edge or open side of a walking surface.

C. The guards shall extend not less than 30 inches beyond each end of components that require service.

D. The top of the guard shall be located not less than 42 inches above the elevated surface adjacent to the guard.

E. The free-standing roof guard system shall meet OSHA requirements (Standard 29-CFR) 1910.29, 1926.502 and the IBC 2002.

F. The railing shall be 48 inches high and shall be fabricated of 1-1/4 inch steel tubing. The top rail loading shall be of 200 lbs in downward or outward direction. The mid rail loading of 150 lbs in any downward or outward direction.

G. The base shall provide safe, stable footing for the railing system. The base specifications shall be the following:
   1. Weight: 70 lbs
   2. Length: 36 inches
   3. Width: 14-1/2 inches
   4. Height: 2-1/2 inches

H. Guards shall be painted yellow or hot-dipped galvanized, contractor shall coordinate with Owner before purchase.

2.14 MOTOR STARTERS

A. Furnish and install all motor starters required for HVAC equipment under this section if not factory installed by the equipment manufacturer. The starters shall be wired by the Electrical Subcontractor.

B. Motor Controls – Manual and Magnetic:
   1. The individually mounted magnetic starters indicated on the plans and as required shall be magnetic across-the-line starters with thermal overload on each phase.
   2. Starters shall be of the size and type required for particular motor horsepower and voltage. Minimum size starter to be Size 0.
      a. All starters shall have OL reset button, pilot light to indicate on or off and hand-off-auto switch in cover, unless indicated otherwise.
      b. All starters to have 120-volt control via individual control transformers fused on the secondary, where not fed at 120 volts.
   3. Manual motor starters shall be furnished with thermal overloads on each phase. Thermal switches shall be provided with pilot lights.
   4. Three (3) auxiliary contacts shall be furnished and installed in all motor starters (1 NC, 2 NO).
   5. Motor starters shall be all manufactured by the same company and shall be one of the following: Square D Company, Allen Bradley, General Electric, Cutler Hammer or ITE.

2.15 PACKAGED ROOFTOP UNIT (RTU-1 & RTU-2)

A. Furnish and install as specified on the design drawings a roof mounted, packaged, variable air volume unit.

B. Products shall be provided from the following manufacturers:
   1. AAON, Carrier, Daikin, Greenheck, JCI/York, Trane, or engineer approved equal.
   2. The HVAC contractor shall be responsible for any electrical, mechanical, or structural modifications required when substituting a product other than the basis of design scheduled on the drawings.

C. Rooftop Units (RTU-1 & RTU-2):
   1. Rooftop units shall be a variable air volume supply air unit with natural gas heat, packaged DX cooling, 100% dry bulb economizer, and barometric relief.
   2. The unit shall include all components including casing, filters, supply fans, dampers, gas fired furnace/heat exchanger, packaged DX cooling coils, accessories, and roof curb as required for a fully functioning unit.
   3. Unit shall be factory assembled and tested including leak testing of the coils and run testing of the completed unit.
   4. Unit shall have decals and tags to indicate lifting and rigging, service areas and caution areas for safety and to assist service personnel.
   5. Unit components shall be labeled, including pipe stub outs and electrical and controls components.

D. Construction:
   1. All cabinet walls, access doors, and roof shall be fabricated of double wall, impact resistant, rigid polyurethane foam panels.

2. Unit insulation shall have a minimum thermal resistance R-value of 13. Foam insulation shall have a minimum density of 2 pounds/cubic foot and shall be tested in accordance with ASTM D-1929 for a minimum flash ignition temperature of 610°F.
3. Unit construction shall be double wall with G90 galvanized steel on both sides and a thermal break. Double wall construction with a thermal break prevents moisture accumulation on the insulation, provides a cleanable interior, prevents heat transfer through the panel, and prevents exterior condensation on the panel.
4. Unit shall be designed to reduce air leakage and infiltration through the cabinet. Cabinet leakage shall not exceed 1% of total airflow when tested at 3 times the minimum external static pressure provided in AHRI Standard 340/360. Panel deflection shall not exceed L/240 ratio at 125% of design static pressure, at a maximum 8 inches of positive or negative static pressure, to reduce air leakage. Deflection shall be measured at the midpoint of the panel height and width. Continuous sealing shall be included between panels and between access doors and openings to reduce air leakage. Refrigerant piping and electrical conduit through cabinet panels shall include sealing to reduce air leakage.
5. Roof of the unit shall be sloped to provide complete drainage. Cabinet shall have rain break overhangs above access doors.
6. Access to filters, dampers, cooling coils, reheat coil, heaters, exhaust fans, return fans, energy recovery wheels, compressors, water-cooled condensers, and electrical and controls components shall be through hinged access doors with quarter turn, zinc cast, lockable handles. Stainless steel piano hinges shall be included on the doors.
7. Exterior paint finish shall be capable of withstanding at least 2,500 hours, with no visible corrosive effects, when tested in a salt spray and fog atmosphere in accordance with ASTM B 117-95 test procedure.
8. Units with cooling coils shall include double sloped corrosion proof drain pans.
9. Unit shall be provided with base discharge and return air openings. All openings through the base pan of the unit shall have upturned flanges of at least 1/2 inch in height around the opening.
10. Unit shall include lifting lugs on the top of the unit.
11. Unit base shall be fabricated of 1-inch-thick double wall, impact resistant, rigid polyurethane foam panels.
12. Unit shall include factory wired control panel compartment service lights.

E. Electrical
1. Unit shall be provided with standard power block for connecting power to the unit.
    a. Unit shall be provided with factory installed and factory wired, non-fused disconnect switch.
    b. Unit shall be provided with factory installed and field wired 115 v. 20-amp GFI outlet in the unit control panel.
    c. Weather proof utility type lights with a switch at unit.
    d. Unit shall be provided with phase and brown out protection which shuts down all motors in the unit if the electrical phases are more than 10% out of balance on voltage, the voltage is more than 10% under design voltage or on phase reversal.

F. Supply Fans
1. Unit shall include direct drive, unhoused, backward curved, plenum supply fan(s). The fans must be selected to deliver the scheduled CFM at the scheduled Total Static Pressure.
2. Blowers and motors shall be dynamically balanced and mounted on rubber isolators. Blower and motor assembly shall utilize neoprene gaskets.
3. Motor shall be variable speed, high efficiency electronically commutated motor. Variable frequency drives are acceptable alternatives. VFDs shall be factory wired and mounted in the unit
4. Provide self-aligning, grease lubricated ball or roller bearings selected for L50 200,000 hour average life per ANSI/AFBMA 9. Extend both grease lubrication fittings to drive side of unit with plastic tubes and Zerk fittings rigidly attached to drive side-bearing support.
5. ECM driven supply fan speed shall be controlled with field provided 0-10 VDC control signal.

G. Gas Heat:
1. General:

a. Heat exchanger shall be an induced draft design. Positive pressure heat exchanger designs shall not be allowed.
b. Shall incorporate a direct-spark ignition system and redundant main gas valve.
c. Gas supply pressure at the inlet to the rooftop unit gas valve must match that required by the manufacturer.

2. The heat exchanger shall be controlled by an integrated gas controller (IGC) microprocessor.
a. IGC board shall notify users of fault using an LED (light-emitting diode).
b. The LED shall be visible without removing the control box access panel.
c. IGC board shall contain algorithms that modify evaporator-fan operation to prevent future cycling on high temperature limit switch.
d. Unit shall be equipped with anti-cycle protection with one short cycle on unit flame rollout switch or 4 continuous short cycles on the high temperature limit switch. Fault indication shall be made using an LED.

3. Standard Heat Exchanger construction
a. Heat exchanger shall be of the tubular-section type constructed of a minimum of 20-gauge steel coated with a nominal 1.2 mil aluminum-silicone alloy for corrosion resistance.
b. Burners shall be of the in-shot type constructed of aluminum-coated steel.
c. Burners shall incorporate orifices for rated heat output up to 2000 ft (610m) elevation. Additional accessory kits may be required for applications above 2000 ft elevation, depending on local gas supply conditions.
d. Each heat exchanger tube shall contain multiple dimples for increased heating effectiveness.

4. Induced draft combustion motor and blower
a. Shall be a direct-drive, single inlet, forward-curved centrifugal type.
b. Shall be made from steel with a corrosion-resistant finish.
c. Shall have permanently lubricated sealed bearings.
d. Shall have inherent thermal overload protection.
e. Shall have an automatic reset feature.

H. Coil Section with Factory Installed Coils: The coil section shall be provided complete with coil and coil holding frame. Coil section side panels shall be easily removable to allow for removal and replacement of coils without impacting the structural integrity of the unit. The coils shall be installed such that headers and return bends are enclosed by unit casings.

1. Standard Aluminum Fin/Copper Tube Coils:
a. Standard evaporator and condenser coils shall have aluminum lanced plate fins mechanically bonded to seamless
b. internally grooved copper tubes with all joints brazed.
c. 2. Evaporator coils shall be leak tested to 150 psig, pressure tested to 450 psig, and qualified to UL 1995 burst test at 1775 psig.
d. 3. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 1995 burst test at 1980 psig.

2. Condensate Drain Pans:
a. Primary Drain Pan: Provide double-sloped corrosion proof drain pan of sufficient size to collect all condensation produced from the coil and sloped to promote positive drainage to eliminate stagnant water conditions. The outlet shall be located at the lowest point of the pan and shall be sufficient diameter to preclude drain pan overflow under any normally expected operating condition

I. Damper Assemblies:

1. Unit shall include motor operated outside air, return air, supply air, and economizer damper assemblies as shown on the schematics. The dampers shall be constructed of extruded aluminum, hollow core, airfoil blades with rubber edge seals and aluminum end seals. Damper blades shall be gear driven and designed to have no more than 20 cfm of leakage per sq ft. at 4 in. w.g. air pressure differential across the dampers.

Low leakage dampers shall be Class 2 AMCA certified, in accordance with AMCA Standard 511. Damper assembly shall be controlled by spring return fully modulating actuator.

2. Dampers and actuators shall be provided and installed by the unit manufacturer. Control of the dampers shall be by the HVAC contractor.
3. The dampers shall be sized and constructed to allow for 0-100% economizer operation.

J. Filters: Unit shall include 4-inch thick, pleated panel filters with an ASHRAE efficiency of 30% and MERV rating of 13, upstream of the cooling coil. Unit shall also include 2-inch thick, pleated panel pre-filters with an ASHRAE MERV rating of 8, on the outside air intake. Unit shall include a clogged filter switches monitoring the filters. Unit shall include a Magnehelic gauge mounted in the controls compartment.

K. Controls:
1. Control Panel: Unit shall be provided with an internal control cabinet with a hinged service access door with a quarter-turn lockable handle.
2. The unit shall be constructed so that it can be operated as a heating and cooling system controlled by the programmable thermostat located in the space. The HVAC Contractor shall provide all required DDC controls (hardware, software and sensors) to provide a working system as per the ATC specification and sequence of operation.
3. Laminated color-coded wiring diagram shall match factory installed wiring and shall be affixed to the interior of the control compartment's access door.

L. Accessories:
1. Unit shall be provided with a smoke detector sensing the return and supply air of the unit, wired to shut off the unit's control circuit. See electrical and mechanical drawings and specifications for more information.
2. Unit shall be provided with a safety shutdown terminal block for field installation of a smoke detector which shuts off the unit's control circuit.
3. Unit nameplate shall be provided in two locations on the unit, affixed to the exterior of the unit and affixed to the interior of the control compartment's access door.
4. Unit shall include outside air hood and air opening bird screen.

M. Submittals & Operation and Maintenance Data:
1. Installation, Operation and Maintenance manual shall be supplied within the unit.
2. Maintenance Data: Include instructions for lubrication, filter replacement, motor and drive replacement, spare parts list, and wiring diagrams.
3. Run test report shall be supplied with the unit in the controls compartment's literature pocket.
4. Submit estimated sound power levels (dB) which shall be shown on the unit ratings sheet.

N. Warranty:
1. Manufacturer shall provide a "parts only" warranty for a period of not less than one year from the date of substantial completion. Warranty shall cover material and workmanship that prove defective, within the specified warranty period, provided manufacturer's written instructions for installation, operation and maintenance have been followed.
2. Energy recovery wheel cassette shall carry a 5-year non-prorated warranty, from the date of original equipment shipment from the factory.
3. Warranty excludes parts associated with routine maintenance, such as belts and air filters.

O. Curbs:
1. Curbs shall to be fully gasketed between the curb top and unit bottom with the curb providing full perimeter support, cross structure support and air seal for the unit. Curb gasket shall be furnished within the control compartment of the rooftop unit to be mounted on the curb immediately before mounting of the rooftop unit.
2. Solid bottom curb shall be factory assembled and fully lined with 1-inch neoprene coated fiberglass insulation and include a wood nailer strip. Curb shall be adjustable to allow for sloped roof. Knockdown curbs (with duct support rails) factory furnished for field assembly are acceptable.

P. Field Installed Accessories:

1. Duct Smoke Detectors shall be furnished as part of the packaged rooftop units and shall be wired by the Electrical Subcontractor to the existing fire alarm system. See electrical and mechanical drawings and specifications for more information.
2. A service light and service light switch shall be provided and installed by the Electrical Subcontractor. See electrical drawings and specifications for more information.
3. A powered convenience outlet shall be provided and installed by the Electrical Subcontractor. See electrical drawings and specifications for more information.

Q. Smoke Detectors:
1. Shall be a Four-Wire Controller and Detector.
2. Shall be environmental compensated with differential sensing for reliable, stable, and drift-free sensitivity.
3. Shall use magnet-activated test/reset sensor switches.
4. Shall have tool-less connection terminal access.
5. Shall have a recessed momentary switch for testing and resetting the detector.
6. Controller shall include:
   a. One set of normally open alarm initiation contacts for connection to an initiating device circuit on a fire alarm control panel.
   b. Two Form-C auxiliary alarm relays for interface with rooftop unit or other equipment.
   c. One Form-C supervision (trouble) relay to control the operation of the Trouble LED on a remote test/reset station.
   d. Capable of direct connection to two individual detector modules.
   e. Can be wired to up to 14 other duct smoke detectors for multiple fan shutdown applications.
7. Shall be provided on both the supply and return ductwork openings within the unit.

2.16 VARIABLE REFRIGERANT FLOW (VRF) SYSTEMS

A. General: Furnish and install VRF systems as specified in the bid documents. The systems shall be in accordance with the schedule on the drawings for type, size, capacity, efficiency, model numbers and components. All units shall be listed and rated by ANSI/AHRI Standard 1230-2010, be ANSI/UL STD 1995 listed, and listed by Electrical Testing Labs (ETL) and bear the cETL label. All wiring shall be in accordance with the National Electric Code (NEC). All system designs shall comply with ASHRAE 15 Mechanical Refrigerant Code. Systems shall be manufactured by Daikin, Fijitsu, LG, Mitsubishi or engineer approved equal. The contractor shall be responsible for any electrical, mechanical, or structural modifications required when substituting a product other than the basis of design scheduled on the drawings.

B. System Descriptions: VRF system shall automatically vary the target evaporating and condensing temperatures based on building load and weather conditions to increase part load efficiency (Variable Refrigerant Temperature). VRF system shall automatically vary the target evaporating and condensing temperatures based on building load and weather conditions to increase part load efficiency (Variable Refrigerant Temperature).
1. Heat Recovery: Variable capacity, heat recovery heating and cooling system capable of simultaneous heating and cooling of each indoor unit. The systems shall consist of air-cooled outdoor condensing unit, BC (Branch Circuit) Controller, multiple indoor units, and associated piping and controls. Each indoor unit or group of indoor units shall be capable of operating in any mode independently of other indoor units or groups. System shall be capable of changing mode (cooling to heating, heating to cooling) with no interruption to system operation and shall be capable of simultaneous heating and cooling of various zones. Each indoor unit or group of indoor units shall be independently controlled and capable of changing mode automatically when zone temperature strays from set point. The sum of connected capacity of all indoor air handlers shall range from 50% to 120% of outdoor rated capacity. Heat Recovery Systems include: OU-1.

C. Outdoor Air-Cooled Condensing Units:
1. General:
   a. The outdoor air-cooled condensing units shall be of a type specifically used in a VRF system. Each outdoor unit module shall be completely factory assembled, piped and wired and run tested at the factory. The outdoor units shall be equipped to interface with the controls of the VRF system

and shall perform all functions necessary for operation of the VRF system. VRF system shall meet performance requirements per schedule and be within piping limitations & acceptable ambient temperature ranges as described in respective manufacturers' published product catalogs. Non-published product capabilities or performance data are not acceptable

b. Outdoor unit systems may be comprised of multiple modules with differing capacity if a brand other than basis of design is proposed. All units requiring a factory supplied twinning kits shall be piped together in the field, without the need for equalizing line(s). If an alternate manufacturer is selected, any additional material, cost, and labor to install additional lines shall be incurred by the contractor. Contractor responsible for ensuring alternative brand compatibility in terms of availability, physical dimensions, weight, electrical requirements, etc.

c. The outdoor unit shall have an accumulator with refrigerant level sensors, an auto-charging feature to ensure proper refrigerant charge, and controls.

d. The outdoor unit shall have a high efficiency oil separator plus additional logic controls to ensure adequate oil volume in the compressor is maintained.

e. The system will automatically restart operation after a power failure and will not cause any settings to be lost.

f. The following safety devices shall be included on the condensing unit: high pressure sensor and switch, low pressure sensor, control circuit fuses, crankcase heaters, fusible plug, overload relay, inverter overload protector, thermal protectors for compressor and fan motors, over current protection for the inverter, and anti-recycling timers.

2. Heat Recovery Systems: The outdoor unit modules shall be air-cooled, direct expansion (DX), multi-zone units. The outdoor unit shall be capable of heating operation down to -13°F ambient temperature, simultaneous heating/cooling mode from 14-70□F ambient temperatures, and cooling operation between 23°F - 109°F ambient temperature. Tested factory data on heating capacity and efficiency shall be available. Continuous heating shall be provided during defrost mode for multi-module systems.

3. Unit Cabinet:

   a. The casing(s) shall be fabricated of galvanized steel, bonderized and finished. The outdoor unit shall be tested in compliance with ISO9277.

   b. The outdoor unit shall be provided with a manufacturer supplied snow /hail guard. The snow/hail guard protects the outdoor coil surfaces from hail damage and snow build-up.

4. Fan:

   a. Each outdoor unit module shall be furnished with direct drive, variable speed, propeller type fan(s). The fan shall be factory set for operation under 0.12 in. WG external static pressure, but capable of normal operation under a maximum of 0.24 in. WG external static pressure via dipswitch.

   b. All fan motors shall have inherent protection, have permanently lubricated bearings, and be completely variable speed. All fan motors shall be mounted for quiet operation.

   c. All fans shall be provided with a raised guard to prevent contact with moving parts.

5. Coil: The outdoor coil shall be of nonferrous construction with lanced or corrugated plate fins on copper tubing. The coil fins shall have a factory applied corrosion resistant finish. Uncoated aluminum coils/fins are not acceptable. The coil shall be protected with an integral metal guard.

6. Compressor:

   a. Each outdoor unit module shall be equipped with inverter scroll compressors. Compressors shall be high efficiency reluctance DC (digitally commutating), hermetically sealed, variable speed type. Temperatures and pressures shall be read and calculated. With each reading, the compressor capacity (INV frequency) shall be controlled to eliminate deviation from target value. Non inverter-driven compressors shall not be accepted.

   b. All compressors shall have an inverter to modulate capacity. The capacity for each module/system shall be variable with a minimum turndown not greater than 20% of the scheduled nominal capacity. Inverter board shall be cooled to prevent inefficient and unstable operation.

   c. The compressor will be equipped with an internal thermal overload.

   d. The compressor shall be mounted to avoid the transmission of vibration.

e. In the case of multiple condenser modules, operation hours of the compressors shall be balanced by means of the Duty Cycling Function.

7. Electrical:
   a. The outdoor unit electrical power shall be 208/230 volts, 3-phase, 60 hertz.
   b. Control wiring shall be installed in a daisy chain configuration between all VRF components as per Manufacturer.
   c. The control circuit between the indoor units, BC Controller and the outdoor unit shall be completed using a 2-conductor, communication type twisted pair shielded cable to provide total integration of the system.

D. Branch Circuit (BC) controllers: (Required for simultaneous heat/cool systems.)
   1. General: The BC Controllers shall allow simultaneous heating and cooling by allowing either hot gas refrigerant to flow to indoor units for heating or liquid refrigerant to flow to indoor units for cooling. The BC Controller shall be completely factory assembled, piped and wired. Each unit shall be run tested at the factory. Units shall be equipped with a circuit board that interfaces to controls system and shall perform all functions necessary for operation.
   2. The BC Controllers shall include single branch boxes, that serve single indoor units, and multiple branch boxes which allow simultaneous heating and cooling of several units. Selector box cabinets shall house multiple electronic expansion valves and a sub-cooling loop. The unit shall operate by allowing either hot gas refrigerant to flow to indoor unit(s) for heating or subcooled liquid refrigerant to flow to indoor unit(s) for cooling. This unit shall be mounted indoors, with access and service clearance provided for each controller.
   3. BC Unit Cabinet
      a. The casing shall be fabricated of galvanized steel and contain sound absorption thermal insulating material made of flame and heat resistant foamed polyethylene.
      b. Each cabinet shall house a liquid-gas separator and multiple refrigeration control valves.
      c. The unit shall house two tube-in-tube heat exchangers.
   4. Integral Drain Pan: An integral condensate pan and drain shall be provided if required by the manufacturer. Manufacturers with branch selector boxes requiring secondary drain pans and drain connections shall coordinate with the installing contractor at no extra cost to the owner.
   5. Electrical: The unit electrical power shall be 208/230 volts, 1 phase, 60 Hertz. The control circuit between the indoor units, BC Controller and the outdoor unit shall be completed using a 2-conductor, communication type twisted pair shielded cable to provide total integration of the system.
   6. Manufacturers with branch selector box sizes, arrangements, or locations that differ from that specified shall make the necessary arrangements to ensure their alternative branch selector boxes both fit in the space and that ASHRAE 15 compliance is still met.

E. Indoor Air Conditioning Units:
   1. Wall Mounted Indoor Units
      a. General: The wall mounted indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, and an auto restart function. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory. The unit shall be suitable for installation within a conditioned space. The cabinets shall be fastened to the wall with horizontal refrigerant and condensate knockouts
      b. Cabinet: galvanized steel cabinet shall be constructed with sound absorbing fiberglass urethane foam insulation. The cabinet shall be affixed to a factory supplied wall mounting template and located in the conditioned space. The front grille shall be removeable for filter access.
      c. Fan: The fan type shall be direct-drive cross-flow with statically and dynamically balanced impeller with high and low fan speeds available.
      d. Filter: The return air shall be filtered by a washable resin net mold resistant filter.
      e. Condensate drain pan: A corrosion proof condensate drain pan shall be included as standard equipment.

f. Electrical: The unit electrical power shall be 208/230 volts, 1-phase, 60 hertz.

g. Line-Hide as manufactured by Mitsubishi, Diversitech, DuctlessAire, or approved equal shall be provided for exposed condensate and refrigerant piping.

F. Controls:

1. Local Controls: The indoor units shall be supplied with individual zone controllers hard wired by installing contractor. The zone controllers shall be capable of the following actions: a thermostat sensor, 7-day weekday plus Saturday Sunday schedular, single and dual setpoints for occupied periods and independent setback setpoints for unoccupied periods, the controller shall have the ability to digitally prohibit individual buttons and functions, custom mode selection, and a self-diagnosis function that constantly monitors the system for malfunctions.

   a. Wall mounted thermostat wiring shall be provided with Wiremold 2000 for all units as required. Coordinate color with the architect.

2. Central Control System:

   a. Provide a multi-zone controller for installation in 206 – Office/IT, coordinate exact location with the Owner & Maintenance. The controller shall have an LCD touch screen able to display and manipulate screen views and functionalities.

   b. The central controller shall be capable of the following functionalities:

      1) Control of set points, schedules, fan speeds, heat/cool mode, and of setback (override) temperature settings during unoccupied periods.

      2) Remotely adjust temperature limits or disable individual functions of the wall mounted zone controllers.

      3) Visible and audible alarm indication of system malfunctions with error code.

      4) Tiered hierarchy allowing for control of indoor units independently or as a group.

      5) Automatic changeover control of indoor units with averaging method, voting method, and changeover, a guard timer control.

      6) “3D” Floor plan graphic layout.

      7) Floor plan will include capability to control indoor unit, and auxiliary inputs / outputs as follows: Up to 4 status points to be assigned to the control point icon, Status and control points to display on corresponding location of zone served on floor plan, Digital input and output icons will display On/Off status, Analog input icons will display analog value.

   c. Web enabled for remote access from PC, tablet or portable device and automatic alert and error emails.

   d. Provide capability for future VRF system expansion.

   e. The central controller shall be capable of interfacing with a BACnet BAS system and be able to send/receive communication from the BAS system.

   f. System controls and control components shall be installed in accordance with the manufacturer’s written installation instructions.

   g. Control system start-up shall be a required service to be completed by the manufacturer or a duly authorized, competent representative that has been factory trained in controls system configuration and operation.

G. Refrigerant and Refrigerant Piping

1. Refrigerant: R410A refrigerant shall be required for the VRF systems

2. Piping: All refrigerant piping materials and joining methods shall be approved by the VRV system manufacturer. Refrigerant line sizing shall be in accordance with manufacturer specifications. Future changes to indoor unit styles or sizes must be possible without resizing/replacing refrigerant piping to any other branch devices or indoor units.

   a. Pre-insulated line sets: Manufacturer approved Pre-insulated line sets may be used. Lines shall be hung to avoid sagging. Do not allow lines to lay on ceiling system. Pre-Insulated line sets shall have an insulation thickness as recommended by the VRF manufacturer.

   b. Rigid Copper Refrigerant Pipe: ASTM B819, type #ACR hard drawn or annealed with ASME B16.22 wrought copper fittings.

c. All refrigerant pipe connections shall be in accordance with manufactures recommendations.

d. Service shut-off valves shall be field-provided/installed for each branch to allow service to any indoor unit without field interruption to overall system operation.

e. All refrigerant piping must be insulated with closed cell, CFC-free foam insulation with flame-spread index of less than 25 and a smoke-development Index of less than 50 as tested by ASTM E 84 and CAN / ULC S-102. R value of insulation shall be at least 3.

H. Substitutions: All substitutions must be capable of meeting the project phasing and scheduling requirements. Selection of a system other than of the basis of design shall be permitted only if the substitution is capable of meeting the project schedule as outlined in the project manual. No additional cost associated with the substitution shall be the responsibility of the owner. All costs associated with changes to abatement, structure, or architectural scope shall be the responsibility of the contractor. Selection of a system other than of the basis of design requires the following to be submitted to the design team for review.

1. Provide full size drawings of the VRF system showing piping layout with system take offs in the same scale, with similar detail to the original construction documents.
2. Provide submittal cutsheets indicating the design, capacity, performance, weights, and layout of the proposed substitution.
3. The contractor is responsible to re-calculate refrigerant volumes for compliance with ASHRAE 15 Mechanical Refrigerant Code.

2.17 AUTOMATIC TEMPERATURE CONTROL SYSTEM

A. General:

1. Furnish and install, as hereinafter specified and indicated on the drawings, a complete direct digital control (DDC) and electric/electronic control system. The system shall be native BACnet-based. The Operator Workstation, all building controllers, application controllers and all input/output devices shall communicate using the protocols and network standards as defined by ANSI/ASHRAE Standard 135, BACnet.
2. The automatic control system shall be Automated Logic Control, Delta Controls, Distech Controls, Honeywell, Johnson Controls, Inc., Schneider Electric, Siemens Building Technologies, Trane Company, or Engineer approved equal.
3. The DDC control panels shall be programmed, monitored and controlled from a Building Management System (BMS) which includes an Operator Workstation (OWS) located in the Custodial Office on the first floor. The OWS shall be equipped with all software, programming and servicing tools, and access credentials to operate and maintain the system. The OWS shall be provided with essential software and network terminals for both remote access and local troubleshooting. All Input/Output points connected to DDC control panels shall be displayed on the BMS & OWS and Network Terminals. The OWS shall be remotely accessible using the building IT network.
4. The control system shall be furnished and installed by competent control engineers and mechanics.
5. The system shall be expandable for future equipment.
6. The control system shall include native BacNet control components with a web based graphical user interface (GUI). Up to five (5) concurrent users shall be able to access the control system using conventional web browser software (Internet Explorer, Google Chrome, Mozilla Firefox).
7. The ATC system shall communicate seamlessly with the specified Energy Efficiency Educational Display system.
8. The ATC system shall communicate seamlessly with Electrical for trend-logging and energy logging.
9. IT IS THE RESPONSIBILITY OF THE HVAC CONTRACTOR TO VERIFY THE CONTROL COMPONENTS BEING PROVIDED BY THE VARIOUS EQUIPMENT MANUFACTURERS AS PART OF THE EQUIPMENT AND REVIEW THIS INFORMATION WITH THE ATC SUBCONTRACTOR TO ENSURE WHAT EXTRA CONTROL COMPONENTS WOULD BE PROVIDED BY THE ATC SUBCONTRACTOR TO INSTALL A FULLY FUNCTION SYSTEMS AS NOTED IN THIS SECTION. ATC SUBCONTRACTOR IS RESPONSIBLE TO PROVIDE ALL CONTROL COMPONENTS FOR INSTALLATION AND OPERATION OF THE VARIOUS EQUIPMENT AS PER THIS SPECIFICATION.
10. The Automatic Temperature Controls System shall be on standby power provided by the building generator.

B. Scope:

1. Install and/or wire all control devices furnished with equipment which is not factory installed and/or wired. Furnish all control devices required for equipment which is not furnished with the equipment.
    a. The split system AC units shall be controlled by the AC unit's onboard controller. The BAS shall interface with the onboard controller for commands, status, and alarms.
    b. Each wall mounted indoor unit shall be provided with a hard wired, wall mounted thermostat. Thermostat wiring shall be wall mounted and shall be encased in wire mold.
    c. All other equipment controls are by the ATC Subcontractor unless otherwise specified.
2. The control system shall consist of all hardware and software and not limited to, temperature sensors, thermostats, temperature transmitters, controllers, automatic valves, pressure sensors, DDC control panels, operator devices, and other accessory equipment, relays, transformers, automatic dampers and damper operators, along with a complete system of electrical & control wiring to fulfill the intent of the specification and provide for a complete and operable system. All control equipment shall be fully proportioning, except as noted otherwise. A well-defined component naming convention shall be established to clearly identify all the control components. The object naming convention shall be approved by the building Owner before controls installation and programming begins.
3. The Direct Digital Control System shall be capable of integrating multiple building functions including equipment supervision and control, alarm management, energy management, and historical data (trends) collection and archiving for one (1) year or longer, and shall consist of the following:
    a. Stand-alone DDC Panels.
    b. Stand-alone Application Specific Controllers (ACS's).
4. The System shall be modular in nature and shall permit expansion of both capacity and functionality through the addition of sensors, actuators, stand-alone DDC panels, and operator devices.
5. System architectural design shall eliminate dependence upon any single device for alarm reporting and control execution. Each DDC panel shall operate independently by performing its own specified control, alarm management, operator I/O, and historical data collection. The failure of any single component or network connection shall not interrupt the execution of control strategies at other operational devices.
6. Provide capability to monitor and control the DDC system remotely. The BMS shall be capable of remote alarming in the form of text alerts and/or email.
7. System Adjustment: Upon completion of the project, the ATC Subcontractor shall completely adjust, ready for use, all thermostats, controllers, valves, damper operators, relays, and other items., provided under this section. Include a points check-out report.

C. The following incidental work shall be furnished by the designated contractor under the supervision of the control contractor:

1. The HVAC Contractor shall:
    a. Coordinate the work required for the ATC system with other contractors.
    b. Install automatic valves, instruments wells, taps, flow stations and other similar devices specified to be furnished by the ATC Subcontractor.
    c. Provide, on magnetic starters furnished, all necessary auxiliary contacts, with buttons and switches in required configurations.
    d. Furnish and install access doors or other approved means of access through ceiling and walls for service to control equipment.
    e. Provide all necessary cutting & patching.
    f. For work involving Sheet Metal Ductwork:
        1) Install all automatic dampers and airflow stations that are specified to be supplied by the ATC Subcontractor.
        2) Provide necessary blank-off plates (safing) required to install dampers that are smaller than duct size.
        3) Assemble multiple section dampers with required interconnecting linkages and extend required number of shafts through duct for external mounting of damper motors.

4) Furnish and install access doors or other approved means of access through ducts for service to control equipment.

2. The Electrical Subcontractor shall,
   a. Provide 120v power sources for use by the ATC Subcontractor as shown on the electrical drawings. All other required power sources shall be provided by the ATC Subcontractor.
   b. Wire all power feeds through all disconnect starters to electric motor.
   c. Wire and remote start/stop switches and manual or automatic motor speed control devices not furnished by the ATC manufacturer.
   d. Provide and wire to the fire alarm system all required smoke detectors. Detectors shall be furnished with the rooftop units and wired to shut down the unit by the ATC Subcontractor as required.

D. Electric Wiring:
   1. All electric wiring and wiring connections, either line voltage or low voltage, required for the installation of the temperature control system, as herein specified, shall be provided by the temperature control contractor unless specifically shown on the electrical drawings or called for in the electrical specifications. The wiring installation shall be in accordance with National and local codes and with the electrical portion of these specifications. All wiring shall be run concealed wherever possible. Exposed wiring in occupied spaces shall be run in raceways. Raceways shall be Wiremold 200 Series with all elbows, raceways, covers, mounting stops, box extensions and wiring for a complete and neat installation. 120-volt power shall be provided by the Electrical Subcontractor. Exposed wiring in the Mechanical spaces shall be run in EMT conduit.
   2. All wiring shall comply with the requirements of the state and National Electric Code.
   3. All control wiring required for the automatic control system shall be provided from these points by the ATC Subcontractor who shall provide transformers and all control devices required for the control system. The wiring installation shall be in accordance with National and Local Codes. All wiring shall be run concealed wherever possible. Exposed wiring in occupied spaces shall be run in raceways. Raceways shall be Wiremold 200 Series with all elbows, raceways, covers, mounting stops, box extensions and wiring for a complete and neat installation. Exposed wiring in the Mechanical spaces shall be run in EMT conduit. Provide control wiring between HVAC equipment and associated remote-control panels and between control panels and remote sensors. Provide all interfaces between HVAC equipment and the DDC system.
   4. All conduits for control system wiring and cabling must match the color required in the electrical specifications.

E. Submittal Brochure: The following shall be submitted for approval:
   1. Control drawings with detailed piping and wiring diagrams, including bill of material and description of operation for all systems.
   2. Panel layouts and nameplate lists for all local and central panels.
   3. Valve and damper schedules showing size, Cv, configuration, capacity and location of all equipment.
   4. Calculations for valve coefficients (CVs).
   5. Data sheets for all control system components.
   6. Control strategies (software flow charts) shall be included within the first ATC shop drawing submittal. The listing of each strategy shall be in English and demonstrate the desired ATC sequence of operation. Submittal shall be complete with proposed schedules, listing of setpoints and end device point listing and address.
   7. Sequence of operations. Provide narrative descriptions of sequences of operation, Descriptions shall not merely duplicate specified sequences of operations.
   8. Point names and addresses.
   9. System riser diagrams.
   10. Data sheets for all control system components.

F. Owner Training: The controls contractor shall have the following training responsibilities:
   1. Provide designated Owner personnel (5) 4-hour training sessions, (5) 4-hour follow ups during warranty period. The sessions shall cover all areas listed in this section including:

a. General purpose of the system and equipment
b. DDC panel equipment locations.
c. Review of control drawings and schematics
d. Sequence of Operations for HVAC equipment: Occupied mode, start-up, normal operation, heating, ventilating, shutdown, unoccupied operation, night ventilation.
e. Building Automation System: programming, trending, troubleshooting, alarms, manual operation, interface with equipment packaged controls.
f. Energy conservation strategies and operations, system and setpoint adjustments.
g. Preventative Maintenance and replacement part sources.
h. O&M Manual review
i. Questions and Answers.

2. The controls contractor shall provide designated Owner personnel training on the control system in this facility. The intent is to clearly and completely instruct the Owner on all the capabilities of the control system.
   a. Training manuals. The standard operating manual for the system and any special training manuals will be provided for each trainee, with three extra copies left for the O&M manuals. In addition, copies of the system technical manual will be demonstrated during training and three copies submitted with the O&M manuals. Manuals shall include detailed description of the subject matter for each session. The manuals will cover all control sequences and have a definitions section that fully describes all relevant words used in the manuals and in all software displays. Manuals will be approved by the CxA and AE. Copies of audiovisuals shall be delivered to the Owner.
   b. The trainings will be tailored to the needs and skill-level of the trainees.
   c. The trainers will be knowledgeable on the system and its use in buildings. For the on-site sessions, the most qualified trainer(s) will be used. The Owner shall approve the instructor prior to scheduling the training.
   d. During any demonstration, should the system fail to perform in accordance with the requirements of the O&M manual or sequence of operations, the system will be repaired or adjusted as necessary and the demonstration repeated.
   e. The controls contractor shall attend sessions other than the controls training, as requested, to discuss the interaction of the controls system as it relates to the equipment being discussed.

G. Guarantee: The control system designated on drawings and plans and herein specified shall be guaranteed to be free from original defects in both material and workmanship for a period of twelve (12) months or normal use and service, excepting damages from other causes. This guarantee shall become effective starting the date the owner begins to receive beneficial use of the system. During the twelve (12) month guarantee period, Contractor shall provide programming changes to the installed system as requested by the Owner for a maximum of ten (10) hours.

H. Programmed Maintenance:
   1. Upon completion of the installation, the ATC Subcontractor shall submit to the owner, an agreement to provide the necessary programmed maintenance to keep the various control systems in proper working condition.
   2. This programmed maintenance agreement shall fully describe the maintenance work to be performed and shall advise the cost of this work during the guarantee period, as well as for subsequent years thereafter. For two (2) thru five (5) years, Contractor shall advise the cost breakdown for annual service, discount on parts, miscellaneous programming and telephone support.

I. Local Area Network:
   1. Operator workstation and DDC panels shall directly reside on a dedicated local area network such that communication may be executed directly between controllers, directly between workstation, and between controllers and workstation on a peer-to-peer basis.
   2. All operator devices, either network resident or connected via modems, shall have the ability to access all point status and application report data, or execute control functions for any and all other devices via the local area network. Access to data shall be based upon logical identification of building equipment. Access

to system data shall not be restricted by the hardware configuration of the facility management system. The hardware configuration of the EMA network shall be totally transparent to the user when accessing data or developing control programs.

J. Sensors:

1. Room Type Instruments: Day/night heating/cooling electronic space thermostats shall be provided as indicated on the drawings. Each room temperature thermostat shall include a terminal jack integral to the thermostat assembly. The terminal jack shall be used to connect a portable service tool or similar operator's terminal to control and monitor all hardware and software points associated with the controller.
   a. Each room thermostat shall also include the following auxiliary devices:
      1) Setpoint Adjustment: local thermostats shall have ability to change room set-point temperature +/- 3ºF (adj.).
      2) Temperature Indicator: Room thermostats shall have the room temperature setpoint as the primary display with the real time space temperature available for secondary view. The temperature indicator shall be digital display and shall be visible without removing the thermostat cover.
      3) Occupancy override switch: The occupancy override switch shall have ability to override the room occupancy setting for 1.25 hours (adj.).
   b. The setpoint adjustment shall allow for modification of the temperature by the occupant. Setpoint adjustment may be locked out, overridden or limited as to time or temperature through software by an authorized operator at the central DDC system.
   c. The override switch shall initiate override of the night setback mode to normal (day) operation when activated by the occupant. An authorized operator at the central DDC system may lock out, the override function overridden or limited as to the time through software.
   d. Any thermostat or sensor located on an exterior wall or an interior wall adjacent to an interior space that is not maintained at a similar temperature during the winter (i.e., a sometimes-heated garage) must have an insulating base.
   e. Provide wall mounted thermostat wiring with Wiremold 2000 as manufactured by Legrand or approved equal. Coordinate color with the Owner.
2. Temperature Sensors and Transmitters:
   a. Accuracy:
      1) Duct Mounted: Plus or minus 0.75F accuracy over a range of 20F to 120F. These temperature sensors may be thermistor or RTD; thermistors shall have a maximum 5-year drift of no more than .225°F maximum error of no more than .36°F.
   b. Insertion Elements in Ducts: Single point, 6 inches long; use where not affected by temperature stratification or where ducts are smaller than 4 sq. ft.
   c. Averaging Elements in Ducts: 60 inches, long, flexible for use where prone to temperature stratification or where ducts are larger than 4 sq. ft.; 264 inches long, flexible for use where prone to temperature stratification or where ducts are larger than 10 sq. ft; length as required.
   d. Outside-Air Sensors: Provide with NEMA 4 Watertight inlet fitting, shielded from direct sunlight. Locate sensor in a sheltered area on North side of building and monitor by BAS for use in specified control sequences.
3. Electronic Valve/Damper Position Indication: Visual scale indicating percent of travel and 2- to 10-V dc, feedback signal.
4. Carbon-Dioxide Sensor and Transmitter: Return air duct mounted or space (wall/ceiling) carbon dioxide sensors shall be provided where called for on the design drawings. Single detectors, hard wired, using solid-state infrared sensors, suitable over a temperature range of 23°F to 130°F, calibrated for 0 to 2 percent, with continuous or averaged reading, 4 to 20 mA output, and wall mounted. Combination temperature and CO2 sensors are not acceptable.
5. Occupancy Sensor: Passive infrared, with time delay, daylight sensor lockout, sensitivity control, and 180-degree field of view with vertical sensing adjustment, for flush mounting.

K. Equipment

1. Stand-alone DDC Panels: Shall be microprocessor based multi-tasking, multi-user, real time digital control processors. Each stand-alone DDC panel shall consist of modular hardware and plug in enclosed processors, communication controllers, power supplies, and input/output modules. A sufficient number of controllers shall be supplied to fully meet the requirements of this specification and the attached point list. Each DDC panel shall have sufficient memory to support its own operating system and data bases, including:
    a. Control process.
    b. Energy management applications.
    c. Alarm management.
    d. Historical/trend data for all points.
    e. Maintenance support applications.
    f. Custom processes.
    g. Manual override monitoring.
2. Application Specific Controllers (ASC): The air handling units (RTU) shall be furnished with control panels by the unit manufacturer. Furnish and install application specific controllers for each cabinet unit heater, wall heater, unit heater and exhaust fans. Application specific controllers shall be 16-bit microcomputer based, providing a multi-tasking, multi-user operating system. The ASC controllers shall permit the simultaneous operation of all control, communication facilities management and operator interface software as programmed by the ACT Contractor or user. Modification of the on-board ASC controller data base shall be performed online using the built in or portable POT. Systems which require the ASC to be removed from service while DDC control sequences are modified shall not be accepted. ASC controllers shall utilize true floating-point arithmetic capabilities.
3. Smoke Detection System: Duct smoke detectors shall be installed in all air handling equipment exceeding 2000 cfm. Upon detection of smoke, the unit shall be shut down. Unless noted otherwise, the detectors shall be installed in the return & supply air duct or outside air duct as applicable
    a. Smoke Detector: Furnished with the RTU.
    b. Smoke detectors shall be furnished by the RTU manufacturer and wired to building alarm system by the Electrical Subcontractor. All hard-wired interlocking for shutdown of fans shall be by the Electrical Subcontractor if not furnished by the RTU manufacturer. The HVAC Contractor shall use the auxiliary contacts furnished and monitor these points, with an alarm sent to the central workstation if not furnished by the RTU manufacturer.
    c. Except as otherwise specifically indicated, all supply, return and/or exhaust/ventilation systems 2000 cfm and larger that are interlocked with the air handling unit shall automatically stop when the in-duct smoke detectors are activated.
4. Miscellaneous Devices: Provide all the necessary relays, cumulator, temperature and humidity sensors, carbon dioxide sensors, air flow measuring devices, positioners, transformers, and other devises to make a complete and operable system.
5. Building Management Application Software:
    a. DDC panels shall have the ability to perform any of all of the following energy management routines.
        1) Time of day scheduling.
        2) Calendar based scheduling.
        3) Holiday scheduling.
        4) Temporary schedule overrides.
        5) Optimal start.
        6) Optimal stop.
        7) Night setback control.
        8) Peak demand limiting.
        9) Temperature compensated load rolling.
        10) Heating/Cooling interlock.
        11) Economizer.

12) Demand Control Ventilation (DCV).
13) Supply Air Temperature Reset.

b. All programs shall be executed automatically without the need for operator intervention, and shall be flexible enough to allow user customization. Programs shall be applied to building equipment as described in the Sequence of Operation portion of this specification.

6. Points List: The Building Management System shall have the ability to control, adjust and monitor each system as described in the sequence of operation. Provide all control points as required to provide a fully functional and controllable system, including but not limited to those listed below:

a. Global Points:
1) Outdoor air temp. (DB/WB)
2) Outdoor air humidity. (Rh)
3) Outdoor Static Pressure

b. Packaged Rooftop Units (RTU-1 & RTU-2):
1) Unit enable/disable.
2) Supply fan enable/disable.
3) Supply fan status.
4) Supply fan speed
5) Supply airflow cfm.
6) Discharge air temperature.
7) Discharge air humidity.
8) Discharge static pressure.
9) Return airflow cfm.
10) Return air temp.
11) Return air humidity.
12) Outside air damper position
13) Outside airflow cfm.
14) Outside air minimum CFM setpoint.
15) Outside air entering temperature. (DB/WB).
16) Mixed air temperature.
17) Economizer On / Off status
18) Economizer Damper
19) Filter status.
20) Room Temperature
21) Room humidity
22) Indoor static pressure
23) Occupied setpoint.
24) Unoccupied setpoint.
25) Return air CO2 monitoring.
26) Alarms

c. Variable Refrigerant Outdoor Units (OU-1, OU-2):
1) Unit enable/disable.
2) Supply fan enable/disable.
3) Supply fan status.
4) Supply fan speed
5) Outside air temperature.

d. Indoor Units
1) Unit enable/disable.
2) Supply fan enable/disable.

3) Supply fan status.
4) Supply fan speed
5) Temperature setting.
6) Operation setting (heating/cooling mode).
7) Current room temperature.

2.18 SEQUENCE OF OPERATION

A. Packaged Rooftop Unit (RTU-1 & RTU-2): The units shall operate as variable air volume (VAV) units. The VAV air handler has a variable speed supply fan, packaged DX cooling coil, Natural Gas Fired Heat Exchanger, 100% air side economizer with outdoor dry bulb control and barometric relief, with modulating outdoor air dampers. The occupied and unoccupied cycles of operation shall be determined for all units from the wall mounted programmable thermostat. The unit shall be interfaced with the Programmable Thermostat for start/stop status and alarms. Install all control equipment furnished with the unit which are not factory installed, including remote control panels and potentiometer switches with dials. Provide a CO2 sensor in the return air ductwork. Provide all control wiring. The units shall be provided with morning warm-up modes, occupied/unoccupied, and economizer controls.

1. Operation:
   a. Occupied Cycle: The supply fan shall operate continuously and vary fan speed to maintain specified static pressure setpoint. Unit controls shall control supply fan speed, the Packaged DX Cooling, and economizer to maintain cooling discharge air setpoint 55°F (adj.) and the Natural Gas Heat Exchanger to maintain discharge heating setpoint. 90°F (adj.). The Natural Gas Heat Exchanger shall serve as second stage of heat for the space after the FTR serving the space. The minimum OA for each unit shall be controlled by a CO2 sensor located in the return air duct. The outdoor air damper shall modulate open to maintain the CO2 levels below setpoint.
   b. Unoccupied Cycle: The units shall be off and the Packaged DX Coil and Natural Gas Fired Heat Exchanger shall not operate. The outside air damper shall be closed.
      1) During the heating season, the FTR serving the spaces shall energize to maintain unoccupied/night setback space temperature setpoint. 60°F (adj.). If the FTR is unable to maintain the unoccupied space setpoint the unit shall energize and serve as second stage of heat.
   c. Economizer: If the outside air temperature is below 67°F (adj.), modulate the OA & economizer dampers to enable the economizer to operate on demand for cooling.
      1) If the outside air temperature is 2°F above the economizer enable temperature, disable the economizer.
      2) If the mixed air temperature drops below 39°F (adj.) disable the economizer and reset the OA and economizer dampers to normal operation.
   d. CO2 Control: The on board RTU unit controls must evaluate the rooms' CO2 concentrations every 15 minutes (BMS adj.) If the CO2 concentration is below 800 PPM, set the low value of 100 cfm (adj.). If the CO2 concentration is above 1,500 PPM, set the high value of 2,230 cfm (adj.). As the CO2 concentration changes between 800 PPM and 1,500 PPM, the outdoor damper minimum position is linearly reset between the low and high values.
   e. Warm-up: When coming off night setback and upon a demand for heat, the outdoor and exhaust dampers shall be closed, the first stage of heat FTR shall be activated, and the hot water valve and supply fan shall modulate to bring the space up to the heating setpoint. Once the heating setpoint is reached the unit shall resume normal operation.
2. Alarms: Alarms must appear and buffer at the alarm reporting locations until acknowledged.
   a. If a unit fails to prove operation after commanded on or continues to prove operation after commanded off, annunciate an alarm.
   b. If the low limit detection thermostat activates, annunciate an alarm. This is a critical alarm.
   c. If the outdoor air flow, as measured by the AMS, varies by more than 15% from outdoor airflow setpoint, annunciate an alarm. This notification shall require a manual reset.

d. If the room CO2 concentration is above 2,000 PPM for more than 1 hr (adj.) annunciate an alarm.

e. If the room temperature is below 45ºF, annunciate a critical alarm.

f. If the air filter's pressure drop exceeds set point for more than 15 minutes when the supply fan speed is ½ of maximum or higher, annunciate an alarm. Setpoint must be adjusted for fan speed. The setpoint shall be 0.5 in WC (adj.) at maximum fan speed. The equation shall to determine setpoint at lower fan speeds shall be: 0.5 * (fan speed in HZ / maximum fan speed in HZ)2.

3. Safeties: Safeties must be hard wired and not depend on the operation of the programmable thermostat to work.

a. If the unit smoke detectors activate: disable the supply fans, close OA damper.

B. Elevator Machine Room, (AC & ACCU):

1. Elevator Machine Rooms with AC & ACCU only: The AC unit shall be controlled by on board controls and shall modulate as required to satisfy the set-point of the wall mounted cooling thermostat. 75ºF (adj.). Provide all interconnecting wiring between the indoor and outdoor units. Provide room with wall mounted temperature sensor reporting to BAS. The BAS shall annunciate an alarm when the space temperature rises above 80ºF (adj.).

C. Carbon Dioxide Sensors (High Density Rooms): The BAS must monitor the CO2 level in all densely populated rooms (ASHRAE 62.1-2015 default population density of 25 or more people per 1,000 SF) as shown on drawings. The BMS must evaluate the rooms' CO2 concentrations every 15 minutes (BMS adj.) If the CO2 concentration is above 1,800 PPM (BMS adj.) for consecutive measurements the BAS shall annunciate an alarm.

D. Indoor Units (IU):

1. The indoor unit shall be controlled by wall mounted 24/7 programmable thermostat and shall energize the Branch Box Controller whenever there is a call for heating or cooling.

E. Multi-zone Controller (IU/OU):

1. Control of set points, schedules, fan speeds, heat/cool mode, and of setback (override) temperature settings during unoccupied periods.
2. Remotely adjust temperature limits or disable individual functions of the wall mounted zone controllers.
3. Visible and audible alarm indication of system malfunctions with error code.
4. Tiered hierarchy allowing for control of indoor units independently or as a group.
5. Automatic changeover control of indoor units with averaging method, voting method, and changeover, a guard timer control.
6. "3D" Floor plan graphic layout.
7. Floor plan will include capability to control indoor unit, and auxiliary inputs / outputs as follows: Up to 4 status points to be assigned to the control point icon, Status and control points to display on corresponding location of zone served on floor plan, Digital input and output icons will display On/Off status, Analog input icons will display analog value

PART 3 - PRODUCTS

3.1 PIPING

A. Provide and erect in a workmanlike manner all piping systems shown on plans or as required to complete the installation as intended. All piping shall be installed so as to provide access to all valves and equipment.

B. The drawings are schematic and do not indicate all offsets and fittings which may be required. The HVAC Contractor shall carefully investigate the structural and finish conditions of other trades affecting all his work and arrange his work accordingly.

C. All piping, valves, fittings and appurtenances shall be installed at sufficient distances from other work to permit clearance of not less than 1/2" between the finished covering of such piping and all adjacent work whether under this or any other section of the specifications.

D. All piping within the building shall be so installed that it shall in no way be strained or distorted by expansion and contraction. All mains and risers shall be securely anchored to the building construction. Anchors shall be constructed from heavy, forged wrought iron secured to the piping and the building construction.

E. This Contractor shall be held responsible for the quick and free circulation of water in all piping under actual working conditions. System shall be free from noise due to pipe expansion or contraction or from air.

F. In general, pitch all water piping up in the direction of flow.

G. Runouts to equipment connections and risers shall be so piped and valved that any one may be shut off without interfering with the system.

H. All openings in pipe and fittings shall be capped or plugged until permanent connections are made. Use care to keep foreign materials out of the system. Where pipe or tubing cutters are used, or where the pipe is threaded, the burr shall be reamed out to the full inside diameter of the pipe

I. All welding shall be performed in accordance with the standard of workmanship set forth in the National Certified Pipe Welding Bureau, "Specification for the Fabrication and Erection of Piping Systems". Assume full responsibility for all deposited welds and repair all defects in welds developing within one year after final acceptance of the building, without additional cost to the Owner.

J. Where piping passes through fire rated walls and floors, the HVAC Contractor shall repack the openings with a fire-retardant material so as to maintain the integrity of the fire rated wall assemblies to the satisfaction of the Engineer – See section 3.10.

3.2 DUCTWORK

A. Provide and erect in a workmanlike manner all ductwork systems shown on plans or as required to complete the installation as intended. The drawings are schematic and do not indicate all offsets and fittings which may be required. The HVAC Contractor shall carefully investigate the structural and finish conditions of other trades affecting all his work and arrange his work accordingly. All ductwork shall be installed so as to provide access to all dampers or equipment requiring access.

B. Pressure Testing: Provide ductwork pressure testing as required by the applicable codes and in the construction documents.

1. Ductwork shall be pressure tested in accordance with SMACNA HVAC Air Duct Leakage Test Manual, the applicable version of the International Mechanical Code, and other applicable local building codes.

3.3 PAINTING

A. This Contractor shall apply one coat of anti-rust primer and two coats of anti-rust flat black enamel to all steel support hangers and other steel or iron elements of the gas piping system, furnished and installed by the Licensed Plumber. Paint shall be omitted from all items with a galvanized finish.

B. Paint all gas piping with one coat of anti-rust primer and two coats of anti-rust yellow enamel.

C. All surfaces to be painted shall be free of dirt, scale, rust, grease, and oil. Paint shall be applied in accordance with the Manufacturer's Requirements.

D. This Contractor shall touch up, with spray paint, all scratched or damaged surfaces of equipment with factory finish. Spray paint shall be the same color and type as factory finish.

3.4 SYSTEMS IDENTIFICATION

A. Provide Identification for all HVAC ductwork, piping, and equipment included in the scope of the project. The identification shall be in accordance with the owner's identification scheme for the building or with ANSI/ASME Specifications.

1. Brush applied paint and adhesive marking systems shall not be used on this installation.

B. Ductwork: All ductwork shall be identified by pre-printed, color-coded, with lettering indicating system and showing flow direction. Ductwork shall be marked at each junction or branch takeoff, at least once in each room, and at intervals not longer than 20 ft. Stencil shall clearly identify duct service, area served by branch, and arrow indicating direction of flow. On each ductwork label in a mechanical room, prefix the system designation with the

associated equipment number (Example: RTU-1 SUPPLY AIR). Provide markings 10 feet on center in mechanical rooms and 20 feet on center throughout the rest of the building.

C. Piping: All piping shall be identified by semi-rigid plastic pipe markings which shall be provided under this contract. Markers shall be applied on refrigerant liquid and suction lines throughout the building. Provide markings 10 feet on center outside near the outdoor units and in the attic and 20 feet on center throughout the rest of the building. Markings shall indicate pipe content and direction of flow. The basic marker shall be in color as called for under the ANSI Specifications A-13.1. Also, an identification of the pipe content and flow arrows shall be shown in black.

D. All items of mechanical equipment such as RTU, AC, ACCU, and IUs shall be identified by approved nameplates provided by this Contractor.

1. The nameplates to be aluminum 2-1/2" x 3/4" with a black background with etched or engraved natural aluminum lettering. The nameplates shall bear notations corresponding to the same unit notations indicated on the design drawings.
2. All equipment nameplates shall be conspicuously visible externally.
3. Units with unique names i.e. RTU-1 shall be tagged with the scheduled names.
4. Units with recurring tags i.e. IU-1 shall be identified with name followed by room number. IU-1-B200

E. For all mechanical equipment and apparatus including but not limited to control valves, isolation valves, BCs, CO2 sensors that are concealed above the ceiling this Contractor shall provide identification tags at the ceiling above which the above noted equipment is installed for clear identification by the Owner's personnel. The identification tags shall be aluminum 2-1/2" x 3/4" with a black background with etched or engraved natural aluminum lettering that bear notations corresponding to equipment being identified.

3.5 MATERIALS AND WORKMANSHIP

A. All specified materials and equipment shall be furnished new and free of defects.

B. Store all equipment and materials in a clean, dry place to preserve initial quality.

C. Protect installed materials and equipment against damage and corrosion. All equipment shall be left in a first-class condition. The Architect shall determine the adequacy of equipment condition and appearance and it shall be the responsibility of this Contractor to rectify any deficiencies. This shall include, but is not limited to furnishing and applying paint in accordance with the manufacturer's recommendation.

D. All work shall be installed in a first-class manner consistent with the best current trade practices. All devices, materials and equipment shall be securely installed plumb and/or level.

3.6 PROTECTION AND CLEANUP

A. Protection:

1. Be responsible for the maintenance and protection of all material and equipment furnished during all phases of construction from loss, damage or deterioration until final acceptance by the Owner.
2. All materials and equipment on the job site shall be suitably stored and protected from the weather.
3. During the progress of the work all pipes, ducts and equipment openings shall be temporarily closed so as to prevent obstruction and damage.

B. Cleanup:

1. After installation, equipment with factory finished surfaces shall be cleaned and damaged spots touched up with the same type paint applied at the factory.
2. Keep the job site free from accumulation of waste material and rubbish, construction equipment and surplus materials from the site and leave the premises in a clean condition.

3.7 SYSTEM START-UP AND OPERATION

A. After completion of the installation and before acceptance by the Owner, this Contractor shall start-up, operate and thoroughly check the entire HVAC system to assure complete adherence to the design intent. It is intended that the start-up/operational endeavor shall conclusively establish that all systems are functioning properly with respect to rotation of equipment, wiring interlocks, control interlocks and sequential control. Should any portion of

system performance be found to be contrary to the specified intent, same shall be corrected as required, at no cost to the Owner.

B. After completion of the system check procedure and when the HVAC Contractor is firmly convinced that all systems are performing properly and efficiently, he shall submit in writing to the Engineer and Owner a certified statement to that effect.

3.8 SUPPLEMENTAL SUPPORTS

A. Furnish and install all supplementary steel, channels and supports required for the proper installation, mounting and support of all equipment. Method of attachment to the building structure shall be in a manner approved by the Architect. Type and size of supports shall be determined by the HVAC Contractor and shall allow only a minimum amount of deflection.

B. All supplementary steel and channels shall be installed in a neat and workmanlike manner parallel to the walls, floor and ceiling construction. All turns shall be made with 90 degree and 45-degree fittings, as required to suit the construction and installation conditions.

C. Coordinate with the Owner and Engineer to provide concrete housekeeping pads for equipment indicated on the drawings. Provide dimensions of submitted equipment to verify pad sizes. Housekeeping pads shall be constructed of concrete, minimum four inch (4") thick and extending two inches (2") beyond supported equipment unless otherwise specified.

1. Contractor shall level the area underneath the housekeeping pads before pouring concrete.

3.9 SAFETY PRECAUTIONS

A. Furnish, place and maintain proper guards for the prevention of accidents and any other necessary construction required to secure safety of life and property. Conform to all OSHA requirements.

3.10 TESTING, BALANCING AND CLEANING

A. The Owner shall engage a Certified Balancing Contractor to balance and adjust the air handling units using methods and procedures which have been developed and employed to accomplish this service. The HVAC Contractor shall coordinate with the Balancing Contractor and provide required information, access and clearances.

1. Air System Balancing and Cleaning:

a. Before the systems are tested and balanced, all ducts and equipment shall be thoroughly cleaned so that no dirt, dust or other foreign matter will be deposited in or carried through systems. All filters shall be replaced after air handling systems have been cleaned.

b. Each air supply and return system shall be balanced to deliver within 10% the air quantities specified on the drawings.

c. Final air quantities shall be achieved by adjusting fan outlet dampers and fan RPM. Final damper settings shall be permanently marked after air balance report.

d. Set volume controller to airflow setting indicated for variable air volume system powered units. Confirm connections properly made and confirm proper operation for automatic variable air volume temperature control.

e. Submit to the Engineer six copies of the complete air balancing report. Air balancing report shall include for each fan system the fan size, make, model, fan and motor RPM, delivered amperage, CFM, fan static pressures and CFM at each air inlet and outlet.

3.11 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil, materials, and obstructions.

B. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

C. Classified excavation: excavation to subgrade elevations classified as earth and rock.

D. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; together with soil, boulders, and other materials.

E. Intermittent drilling; ram hammering; or ripping of material is earth excavation.

F. Contractor shall be responsible for all damage to existing utilities.

3.12 GRADING

A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

B. Provide a smooth transition between adjacent existing grades and new grades.

C. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

D. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades as required elevations within the following tolerances:

1. Lawn or Unpaved Areas: Plus or minus 1 inch (25mm)

3.13 PHOTOGRAPHS

A. Immediately prior to any excavation work, take pictures of the areas of work, especially exteriror areas. Restore all areas to match pre-existing conditions. Any damage to areas prior to the start of work shall be documented by the photographs.

1. Take not less than 4 views of each item, covering all possible angles, and all areas of work. Take one or more overall views, to give frame of reference for photos.
2. Submit photos on a flash drive(s) or SD memory, and include the same with the O&M manuals.

3.14 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

B. Disposal: Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.

C. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

3.15 FENCE

A. Install all materials in strict accordance with the manufacturer's installation instructions. All workmanship shall be of the highest quality.

B. Place assembled fence sections into position and slide rails into posts. The rails are secured into posts by tabs which are notched into the rails and catch on the inside wall of the post.

C. Check each post for vertical and top alignment, and maintain in position during placement and finishing operation.

D. Install gates plumb, level and secure using bolt-on hardware supplied by the manufacturer.

1. Adjust hardware for smooth operation.

3.16 FIRESTOPPING

A. The Work of this Section shall include, but not be limited to, furnishing and installation of through-penetration firestop systems for penetrations through fire-resistance-rated assemblies.

B. For penetrations through fire-resistance-rated assemblies, provide through-penetration firestop systems that are produced and installed to resist spread of fire, resist passage of smoke and other gases, and maintain original fire-resistance rating of the assembly being penetrated.

1. Fire-resistance-rated assemblies include firewalls, fire partitions, fire barriers, smoke barriers, floors, floor/ceiling assemblies, and ceiling membranes of roof/ceiling assemblies.

C. Provide Shop Drawings for each through-penetration firestop system, indicating each type of assembly penetrated, relationships to adjoining construction, and type of penetrating item. Include UL through penetration firestop system design designation and qualified testing and inspecting agency that evidences compliance with requirements for each condition indicated.

D. Provide a drawing(s) and schedule(s) identifying the locations of penetrations and associated UL through penetration firestop systems, along with the following information:
   1. Type of penetrating item including but not limited to material, size, bare or insulated, insulation material, and insulation thickness.
   2. Type of assembly penetrated identified by a UL assembly designation.
   3. Through-penetration firestop system to be used for each location identified by UL firestop design designation.

E. All through-penetration firestop systems, for each combination of penetration and assembly, shall be obtained from a single manufacturer.

F. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to the specific UL through penetration system designation requirements. Particular attention shall be paid to the annular space between penetrants and assemblies.

G. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate the UL through-penetration firestop systems. Particular attention shall be paid to the annular space between penetrants and assemblies.

H. Provide through-penetration firestop systems that are compatible with one another; with the substrates forming openings; and with any items penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by the approved through-penetration firestop system manufacturer based on testing and field experience.

I. Provide accessory components for each through-penetration firestop system as required by the approved manufacturer to install fill materials. Use only components specified by the approved through-penetration firestop system manufacturer and approved by a qualified testing and inspecting agency for firestop systems indicated. Accessories shall include, but not be limited to, the following items:
   1. Permanent forming/damming/backing materials, including the following:
      a. Slag or rock wool fiber insulation.
      b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
      c. Fire-rated form board.
      d. Fillers for sealants.
   2. Temporary forming materials.
   3. Substrate primers.
   4. Intumescent collars.
   5. Sleeves.

J. Drawings, schedules, and shop drawings shall be reviewed and approved by the General Contractor and Architect prior to submission to the Engineer for review, proof of which shall accompany such submission. Failure to provide proof of the General Contractor's and/or Architect's review and approval will be grounds for immediate rejection of the submission.

END OF SECTION

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SECTION 26.00.00
ELECTRICAL
FILED SUB-BID REQURIED

PART 1 – GENERAL

1.01 GENERAL PROVISIONS

A. The GENERAL REQUIREMENTS, DIVISION 1, and BIDDING AND CONTRACT REQUIREMENTS, DIVISION 0, are hereby made a part of this Specification Section.

B. Examine all Drawings and all Sections of the Specifications and requirements and provisions affecting the work of this Section.

C. The Work to be done under this section is shown on the Drawings E-1, E-2, E-3, E-4 and E-5.

D. Bidding procedures shall be in accordance with latest edition of Massachusetts General Laws, Chapter 149, Section 44, including provisions for pre-qualification; and Chapter 30, Section 39M. Time and place for submission of sub-bids is given in Advertisement for Bids.

E. Sub-bids for work under this Section shall be for complete work of this Section and shall be filed in a sealed envelope with Awarding Authority, at time and place specified in Advertisement for Bids. The following shall appear on the face of the envelope:

PROJECT TOWN OF WAREHAM TOWN HALL AIR CONDITIONING PROJECT
[NAME OF BIDDER]
SUB-BID FOR SECTION 26.00.00, ELECTRICAL

F. Every sub-bid submitted for work under this Section shall be on forms furnished by awarding authority, as required by Section 44 of Mass. General Laws, and specified in Advertisement for Bids.

G. Sub-bids filed with the Awarding Authority shall be as accompanied by bid deposits in form of a bid bond, or cash, or a certified check on, or a treasurer's or cashier's check issued by, a responsible bank or trust company, payable to the Town of Wareham, in compliance with Chapter 149, Section 44 B. Amount of bid deposit shall be 5 percent of value of bid.

H. Additional Requirements:

1. Sub-bidder's attention is directed to Massachusetts G.L. Chapter 149 §44H, as amended, which provides in part as follows:
2. Each sub-bidder shall list in Paragraph E of the "Form for Sub-bids" the name and bid price of each person, firm or corporation performing each class of work or part thereof for which the Section of the Specifications for that subtrade requires such listing, provided that, in the absence of a contrary provision in the Specifications, any sub-bidder may, without listing any bid price, list his own name or part thereof and perform that work with persons on his own payroll, if such sub-bidders, after sub-bid openings, shows to the satisfaction of the Awarding Authority that he does customarily perform such class of work with persons on his own payroll and is qualified to do so. This Section of the Specifications requires that the following classes of work shall be listed in Paragraph E under the conditions indicated herein.

Classes of Work	Reference Spec.	Paragraphs
NONE		

1.02 WORK TO BE PERFORMED

A. The scope of work under this Section, without limiting the generality thereof, includes the furnishing of all labor, materials, equipment, services and incidentals necessary to complete all of the Work in accordance with the Contract Documents which are intended to describe and provide for a finished piece of Work, and are to be cooperative; what is called for by either shall be complete in every detail, notwithstanding whether or not every item necessarily involved is particularly mentioned.

B. Electrical Work shall generally consist of, but not be limited to:

1. Obtain all permits and inspections and pay all fees;
2. Selective demolition of items as noted or shown;
3. Provide all wire and cable, connectors and connections;
4. Provide all raceways, fittings and supports;
5. Provide all device, pull, outlet and junction boxes;
6. Provide all wiring devices and plates;
7. Provide all safety disconnect switches as shown;
8. Provide all panelboards and circuit breakers as scheduled;
9. Provide all nameplates and signage as shown or specified;
10. Provide all fire detection and alarm equipment, devices and ancillary devices as required;
11. Testing, training, commissioning and demonstration of all systems;
12. Record Drawings;
13. Operation and Maintenance Instruction and Manuals;
14. Warranties.

C. All permit and inspection fees for the work of this section shall be paid for by this Contractor.

D. Be prepared for, and accommodate work-arounds, given the likelihood that this Contractor will not be able to access some portions of the building at some times. It is expected that this Contractor will then work in other areas of the Project. Required work-arounds shall not be the basis of any claim for additional compensation.

E. Restore to match surrounding surfaces any area disturbed or exposed by the Work of this contract.

F. Perform work and provide material and equipment as shown on Drawings and as specified or indicated in this Section of the Specifications. Completely coordinate work of this Section with work of others and provide a complete and fully functional installation. Drawings and Specifications form complimentary requirements; provide work specified and not shown, and work shown and not specified as though explicitly required by both. Although work is not specifically shown or specified, provide supplementary or miscellaneous items, appurtenances, devices and materials obviously necessary for a sound, secure and complete installation. Remove all debris caused by the Contractors' work.

G. Drawings are diagrammatic and indicate general arrangement of systems and work included in Contract. It is not intended to specify or to show every offset, fitting or component; however, Contract Documents require components and materials whether or not indicated or specified as necessary to make the installation complete and operational.

H. Wiring shall be routed as required to minimize cutting and patching required. Devices shall be located to comply with code required locations, and to avoid field obstructions, and to comply generally with locations as shown on the drawings. The relocation of devices and related work within 10 feet of location shown on plans shall be included in the contract price.

I. As work progresses and for duration of Contract, maintain complete and separate set of prints of Contract Drawings at job site at all times. Record work completed and all changes from original Contract Drawings clearly and accurately, including work installed as a modification or addition to the original design. Indicate actual circuiting, light fixture locations, device outlet locations, switch assignments, loadcenter schedule, etc.

1.03 RELATED WORK SPECIFIED UNDER OTHER SECTIONS

A. The following items of work are specified and included under other sections of the specifications:

1. Section 23.00.00 HVAC

B. Painting of electrical conduits, pull boxes, hangers, panelboard doors and trim, and all other electrical equipment, to match the surrounding finish as directed by the Architect, shall be done by the Painting Subcontractor.

C. All electric motors shall be furnished and set in place by the trade requiring same and shall be wired by this Contractor.

D. Duct smoke detectors and sampling tubes shall be furnished and set in place by the General Contractor and shall be wired by this Contractor.

E. All control devices including starters, thermostats, pneumatic-electric switches, electric-pneumatic switches, aquastats and alternators required for the automatic temperature control system shall be furnished and installed under the Heating, Ventilating and Air Conditioning Section of the Specifications unless otherwise indicated on the electrical drawings.

F. All automatic temperature control wiring and raceways, including wiring all control devices shall be provided under the Heating, Ventilating and Air Conditioning Section of the Specifications unless otherwise indicated on the electrical drawings.

G. All temporary power shall be provided by the General Contractor.

H. All removal and disposal of demolished electrical items shall be provided by the General Contractor.

I. All cutting and patching required for the electrical work shall be provided by the General Contractor.

1.04 SUBMITTALS

A. Submit shop drawings and manufacturer’s product data in accordance with the provisions of the General Conditions. Submit quantity of copies as requested.

B. List of material and equipment requiring shop drawings shall include, but is not limited to:

1. Wire and Cable
2. Wire and Cable Connectors and Devices
3. Raceways and Fittings
4. Boxes
5. Wiring Devices and Device Plates
6. Panelboards and Circuit Breakers
7. Disconnect Switches
8. Nameplates
9. Fire Alarm System Devices

C. Submittals shall be indexed from list above. Add additional items to end of list. Check, stamp and mark with project name shop drawings and product data before submitting for approval. Specifically indicate on shop drawing transmittal form or by separate letter any deviations from Contract Documents because of standard shop practice or other reason. Cross out, but do not obliterate, material not intended for inclusion in the Work. Clearly indicate material to be included in the Work.

D. Submit for approval all materials incorporated in the Work. Installation of material which is not approved shall be at the risk of this Contractor, and the Owner may order that it be removed and/or replaced.

E. Submit samples of any material or equipment requested, prior to approval.

F. The Engineer will review one initial submittal, and one re-submittal of any item. If review, of re-submittals beyond the first re-submittal are required; this Contractor shall bear the Engineer's cost to review the re-submittal. If materials which have previously been approved or approved-as-noted are re-submitted, this Contractor shall bear the Engineer's cost to review the re-submittal.

1.05 CODES, ORDINANCES AND PERMITS

A. All Work shall be done in strict accordance with the Codes, rules and regulations governing electrical work in the Town of Wareham, and the Commonwealth of Massachusetts, and the Massachusetts Electrical Code. If there is any conflict between plans or specifications and such rules and regulations, the rules and regulations shall take precedence.

B. The publications and/or standards listed below form a part of this specification. The publications are referenced in text by the basic designation only.

1. National Fire Protection Association (NFPA) - USA:
   a. No. 70 National Electrical Code (NEC)
   b. No. 72 National Fire Alarm and Signaling Code
   c. No. 241 Standard for Safeguarding Construction, Alteration, and Demolition Operations
2. Commonwealth of Massachusetts
   a. 527 CMR 12.00 Massachusetts Electrical Code
   b. 780 CMR Massachusetts State Building Code, 9th Edition and it's reference standards
   c. 521 CMR Massachusetts Regulations of the Architectural Access Board

C. Perform work strictly as required by rules, regulations, standards, codes, ordinances, and laws of local, state, and federal government, and other authorities that have lawful jurisdiction.

D. Give notices, file plans, obtain permits and licenses, pay all fees and obtain all necessary approvals from authorities that have jurisdiction. Coordinate with General Contractor for submission of, and/or prepare and submit, an NFPA 241 plan as required by the AHJ. Deliver all certificates of inspection to the Architect. No work shall be covered before examination and approval by the Authority Having Jurisdiction. Replace any imperfect or condemned work with materials conforming to the requirements, and satisfactory to the Architect, without extra cost to the Owner. This Contractor is responsible to obtain all permits and pay all fees.

E. Where the Engineer is to witness testing or perform inspections of work, provide not less than seven (7) calendar days notice to the Engineer of such inspections or testing. At or before request for completion inspection, provide completed as-built plans for review by the Engineer at the final inspection.

F. Where the local Authority Having Jurisdiction (AHJ) requires work which is not included in the Contract, and where such work will result in an added cost to the Owner, this Contractor shall obtain such requirement from the AHJ in writing. Such requirements shall be supported by applicable code, ordinance or law citation(s), or other justification, to the full satisfaction of the Owner.

1.06 INSPECTION OF SITE

A. Prior to submitting a bid, the bidder is advised to with prior arrangement with the Owner, visit the site (See Advertisement for site date) and shall at that time, inspect all existing conditions to ascertain the exact scope and nature of the work that is required under this Contract, how it relates to existing work to remain and all job conditions and restrictions.

B. Bidders are advised to visit the site and inform themselves as to conditions under which this work will be performed, prior to submitting prices. Failure to do so will, in no way relieve the successful bidder from the responsibility of furnishing any materials or performing any work in accordance with the true intent of the Drawings and Specifications.

C. No claim for extra compensation will be recognized if difficulties are encountered which an examination of the site conditions, Drawings and Specifications prior to executing the Contract would have revealed.

1.07 STORAGE AND REMOVAL OF MATERIALS

A. Provide suitable containers on-site for storage of materials, or store material off-site. Type and location of containers shall be subject to the approval of the Engineer.

B. The General Contractor shall provide suitable containers for all demolition and waste materials generated by this work.

1.08 CHANGES IN THE WORK

A. Any addition, deletion or change in the work which affects the contract sum will be addressed via a change order. This Contractor may be noticed to proceed with the work while the change order paperwork is being processed via a bulletin, construction change directive, or other document.

B. In addition to any requirements listed in other sections of the contract, any proposals shall be fully supported by documentation of costs, including material quantities and unit costs, labor units, labor rates and any mark-ups in accordance with the contract. Any sub-contractor proposals shall be similarly detailed. Material unit costs shall be based on the proposer's actual costs, which shall be documented by vendor quotes, invoices or other upon request. Material prices from estimating or pricing guides will not be accepted. Material prices which are in excess of the retail costs of materials in the area will not be accepted.

C. Any change order proposal shall also state the impact, if any, on the contract duration. If no such statement is made, the contract duration will remain unchanged.

D. The proposer shall bear the costs associated with reviewing, documenting and processing any change orders which are the result of a failure to properly carry out the work, or other proposals which are 1) not requested by the Owner, Architect or Engineer, or 2) are not the result of differing conditions.

E. Where the work is under construction control, any change to the work deviating from the approved construction documents must be submitted to and approved by the engineer in advance via a request for information (RFI). The reason(s) for the change must be clearly stated, such as field interference, AHJ request, convenience, etc. Unapproved changes will prevent the issuance of a Final Construction Control Document, acceptance of the work, and payment for unapproved work. The Engineer's costs for addressing RFIs as a result of proposed changes which are for the

convenience of the Contractor shall be paid for by the Contractor. Regardless of the reason, approved changes shall be marked on the as-built drawings by the Contractor.

1.09 SAFETY

A. The General Contractor and this Contractor shall be jointly responsible for all safety on the Project. This shall include safety to the workers, Tenants, the Engineer and Owner and their respective employees. The General Contractor shall develop and implement all safety programs required by mandated and industry standard regulations.

PART 2 – PRODUCTS

2.01 GENERAL

A. Products furnished shall be designed and approved for the intended use, shall meet all requirements of the Massachusetts Electrical Code (MEC), and local codes, shall be manufactured in accordance with the standard indicated, and shall meet the requirements specified in the Contract Documents. Materials and equipment shall be listed by a nationally recognized testing laboratory.

B. All material incorporated in the Work shall be new and unused. Samples of any material or item shall be furnished upon request of the Engineer, prior to approval.

C. All products shall be rated for and approved for use in the application shown, regardless of any notations on the plans. Equipment located outdoors or in wet locations shall be weatherproof, and/or enclosed in suitably rated enclosures. All equipment shall be rated for the current, voltage and phases at which they are applied.

D. All workmanship shall be of the highest quality, as determined by the Engineer. This Contractor will be required to repair or replace all Work which is not of the highest quality and workmanship.

E. All equipment and components shall be installed in strict compliance with manufacturers' recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation.

F. It is the intent of the Specifications that one manufacturer be selected, not a combination, for any particular classification of material. For example, all wire of one manufacturer, all switches of one manufacturer, etc.

G. Where materials, equipment, apparatus, or other products are specified by manufacturer, brand name, type or catalog number, such designation is to establish standards of performance, quality, type and style.

H. This Contractor shall be responsible for ordering and furnishing the correct quantity of material required. Routing and equipment arrangements shown on the drawings are approximate only and are not warranted to be accurate**.**

I. Devices and equipment shall not require batteries to operate, unless expressly specified.

J. Each and all items of the Fire Alarm System shall be listed as a product of a single fire alarm system manufacturer under the appropriate category by Underwriters Laboratories, Inc. (UL), and shall bear the "UL" label. All control equipment shall be listed under UL category UOJZ as a single control unit. Partial listing shall not be acceptable.

K. Peripheral devices connected to or associated with the fire alarm control panel shall be compatible with, and UL listed for use with the fire alarm control panel provided.

2.02 WIRE AND CABLE

A. General

1. Minimum wire size shall be No.14 AWG.
2. All conductors shall be annealed copper, 98% conductivity, Class B stranding, except No.10 AWG and smaller diameter may be solid.
3. Aluminum conductors are not allowed.
4. Minimum sizes shall be No. 12 AWG for power and lighting and No. 14 AWG for control.
5. Conductors shall be identified (colored) as required by the MEC.
6. Wire and cable in underground ducts shall be approved for use in wet locations.
7. Wire and cable shall be manufactured by General Cable Co., American Wire, Okonite, or approved equal.

B. NEC Type THWN/THHN: UL 83

1. Conductors for power, lighting, grounding and control; above grade; No. 14 AWG through No. 8 AWG; shall be NEC type THWN/THHN.

C. NEC Type MC: UL 1569, with full size grounding conductor, and steel or aluminum interlocked armor sheath.

1. Metal-Clad cable shall have full size green grounding conductors.
2. Metal-Clad cable shall be used in concealed locations only. Concealed locations include above ceilings and within dry wall partitions.
3. Metal-Clad cable shall be used in dry locations only.
4. Metal-Clad cable shall be used in all areas of assembly and immediately adjacent areas.

D. Type NM-B Cable shall not be used.

E. NEC Type FPL: UL listed, 14 gauge, 2 conductor, solid with overall red jacket. Where wiring is run in attics, basements or crawl spaces provide in conduit or metal-clad wiring.

2.03 WIRE AND CABLE CONNECTORS AND DEVICES

A. Wire and Cable Connectors and Devices: UL 486.

B. Ground conductors of # 14, 12 and 10 AWG shall be made up using only green wire nuts with grounding pigtail provisions.

2.04 RACEWAYS

A. Surface Raceways: UL 5. Including a system of interlocking, two piece metal raceways, fittings and outlet boxes designed for surface mounting, as manufactured by Wiremold, Hubbell, MonoSystems, T&B or approved equal. Color as selected by architect. Use surface raceway only where explicitly shown or concealed wiring methods or alternate routing of raceway/wiring is not possible, and only with the express permission of the Engineer.

B. Rigid Galvanized Steel (RGS): UL 6. Fittings – threaded.

C. Electrical Metallic Tubing (EMT): UL 797. Fittings – compression one inch and below, set screw over one inch. Pre-painted raceways are not acceptable.

D. Flexible Metallic Conduit (FMC): UL 1.

E. Liquid-tight Flexible Metallic Conduit (LFMC): UL 360. Use for connections at exterior mounted equipment, or other location exposed to weather or wet conditions.

F. Fittings for metallic raceway shall be steel. Connectors for EMT, FMC, LFMC shall have insulated throat.

G. Steel supports or racks shall be galvanized steel channel and fittings. Supports shall be manufactured by Unistrut, Kindorf, Husky Products Company, or approved equal. Steel support rods or support bolts for conduits shall be 1/8" diameter for each inch or fraction thereof of diameter of conduit size, but no rod or bolt shall be less than 1/4" in diameter.

H. All required fittings, offsets and bends required shall be provided to route the conduits from source to destination, whether these are shown on the plans or not. Contractor shall/may arrange conduits as required to avoid obstructions, and account for field conditions. Provide all supports as required by the National Electrical Code.

I. Wireways shall be painted steel trough with screw mounted covers fabricated from a minimum of 14 gauge steel with ANSI grey polyester coating over phosphatized surfaces, inside and outside. Wireways shall be sized as required. Wireways shall be furnished without knockouts.

2.05 BOXES

A. Outlet Boxes: UL listed, NEMA OS 1, with marked volume. Size boxes in accordance with volume requirements of MEC.

B. Outlet boxes shall be specifically designed for the construction encountered, with suitable supports and attachments.

1. Outlet boxes shall be metallic, in gangs and configurations to suit the application, with suitable wire/cable clamps as required. Outlet boxes shall be flush mounted in all finished areas. Ceiling outlet boxes shall be listed and rated for support of light fixtures up to 50 pounds.

2. Surface mounted outlet boxes shall be specifically designed for the construction encountered, with suitable supports and attachments. Outlet boxes shall be metallic, in gangs and configurations to suit the application. Outlet boxes may be surface mounted in unfinished areas.

C. Pull boxes shall be code gauge sheet steel, painted, with screw covers. In wet, exterior or basement areas, provide galvanized sheet steel boxes, with gasketed cover. Where dimensions are shown, these are based on no splices. Increase dimensions as required if splices are provided in pull boxes

D. Where required or shown, locate outlet boxes flush within casework. Provide blank plate to finish opening. General Contractor shall make cutout in casework as required for outlet box.

E. Where required, provide outlet box extensions to bring front of outlet box flush with mounting surface, per MEC 314.22.

F. Junction boxes shall be of size and type to accommodate (1) structural conditions, (2) size and number of raceways, conductors or cables entering, splices, and (3) devices or fixtures for which required.

G. Special care shall be taken to set all boxes correctly square and true with the building finish. Junction boxes and accessories shall be as manufactured by Steel City, Appleton, Raco, or approved equal.

H. Exterior receptacles shall be installed in surface mounted boxes with weatherproof device covers as listed below.

2.06 WIRING DEVICES

A. Receptacles:

1. Specification grade NEMA 5-20R 20A for 20 ampere protected branch circuits, NEMA 5-15R for 15 ampere protected circuits, 125V, side-wired, self-grounding.
2. Receptacles shall be colored as selected by the Architect, with matching color device plate.
3. Ground Fault Circuit Interrupter (GFCI, GFI) duplex, 20 amp, 120 volt, specification grade, 5 mA sensitivity/trip, Class A, with pilot light. GFCI receptacles shall include self-test feature, and comply with UL 943 edition in effect at time of permitting. Where non-GFI receptacles are mounted in common view with GFI receptacles, provide “designer” type receptacle to match appearance of GFI receptacle.
4. Receptacles located in exterior, damp or wet locations shall be listed as weather resistant.
5. Receptacles located in exterior locations shall be GFI type.

B. Device Plates:

1. Device plates shall be brushed stainless steel, one piece, single or multi-gang type selected to match the device or combination of devices. So-called “goof” plates are not allowed.
2. Weatherproof receptacle plates/covers shall be metallic, pad-lockable rated ‘weatherproof while in use’.

C. Locations of all receptacles and switches to be reviewed with Architect prior to rough-in. Coordinate light switch locations with doors as installed, and install switches on latch side of door. Adjust locations as required, without cost. Provide three way switching for lighting at rooms with multiple entries, and at top and bottom of all stairs. Layout and locations of all switching must be confirmed with Architect and Owner prior to rough-in.

D. Wiring devices shall be manufactured by Pass & Seymour/Legrand, Hubbell or Leviton.

2.07 PANELBOARDS AND CIRCUIT BREAKERS

A. Provide panelboards as indicated on the drawings. Panelboards shall be provided with copper buss, bolt-on circuit breakers. Provide copper neutral and ground buss. Provide galvanized sheet steel enclosure, and painted cover with flush door, locking latch and circuit directory pocket. Boxes shall be of sufficient size to provide at least a minimum code gutter space on all sides.

B. The panelboards and all components shall be designed, manufactured and tested in accordance with the latest applicable standards of UL and NEMA including:

1. UL 67 -- Standards for Panelboards
2. UL 50 -- Standards for Cabinets and Boxes
3. UL 489 -- Standards for Molded Case Circuit Breakers

C. Panelboards shall meet Federal Spec. W-P-115c June, 1984.

D. Panelboards shall have an arc flash warning label applied, complying with the MEC.

E. Circuit breakers shall be compatible with and UL listed for use in the panelboard provided. Circuit breakers shall be quick-make, quick-break molded case type in amperes and poles to suit. Coordinate with all trades, and adjust circuit breaker ampere ratings and poles as required to suit installed equipment. Where serving lighting circuits, provide switch duty (SWD) rated circuit breakers. Where serving heating, air conditioning or refrigeration loads, provide HACR rated circuit breakers. Where serving outlets located in living rooms, dining rooms, bedrooms, hallways, etc., provide arc fault circuit protecting circuit breakers.

F. Circuit breakers shall be toggle type, manually operated, trip free with simultaneous opening/closing of all common poles. Trip units shall be thermal-magnetic type.

G. All panels shall be of safety dead front type and shall be labeled by U.L.

H. Panelboards shall have 10% spare circuit breakers, and 25% spare space, or as scheduled on the plans. Where space is required, include all required bussing, connections, hardware, etc. to allow installation of the largest frame size breaker possible.

I. Panelboards shall be fully rated. Series rating shall not be acceptable. Panelboards shall be rated minimum 22,000 amperes interrupting capacity.

J. Where noted on the plans or indicated below, install a branch panel, UL listed surge protection device (SPD), as follows:

1. The SPD units shall be tested to demonstrate suitability for ANSI/IEEE C62.41 Category C1 environments.
2. The SPD shall be installed on the load side of the main lugs or breaker.
3. The panelboard shall be capable of re-energizing upon removal of the SPD.
4. A direct bus bar connection shall be used to mount the SPD component to the panelboard bus bar to reduce the impedance of the shunt path.
5. The SPD shall be included and mounted within the panelboard by the manufacturer of the panelboard.
6. The SPD shall be of the same manufacturer as the panelboard.
7. The complete panelboard including the SPD shall be UL67 listed.
8. A listed SPD shall be installed in or on all new panelboards per NEC 242.

K. Permanent signage with not less than 1” text letters shall be placed on and near panelboards indicating “code required clear space – no storage or obstruction allowed”. If in a utility space, the floor shall be marked with yellow paint stripes, minimum 3” wide to indicate the code required clear space. If the equipment is located in a room, a sign shall also be attached to the outside of the door to the room.

L. Panelboards shall be manufactured by Square D, General Electric or Siemens.

2.08 DISCONNECT SWITCHES

A. Disconnect switches shall be NEMA Heavy Duty Type HD, three pole disconnects with ampere rating as shown on the plans.

B. Disconnect switches located indoors shall be furnished in NEMA 1 general purpose enclosures, and NEMA 3R for outdoor areas or in wet locations. Enclosures shall be of code gauge (UL 98) sheet steel (NEMA 1) or code gauge phosphate treatment with gray baked enamel finish.

C. Disconnects shall be padlockable in the off position, and include a cover interlock to prevent opening while the disconnect is in the ‘ON’ position. Interlock shall have a defeat feature.

D. Disconnects shall be horsepower rated for 600 volts AC. Where required or shown switches shall be fused type with dual element fuses, rated as indicated on the plans, or as required by equipment manufacturer.

E. Switch blades shall be fully visible in the OFF position with the door open. All current-carrying parts shall be copper and plated through electrolytic processes to resist corrosion and promote cool operation. The handle and mechanism shall be an integral part of the box, not the cover.

F. Where required for proper motor/drive protection, provide an auxiliary switch in each motor disconnect for disconnects serving motors fed by variable frequency drives. Provide (2) #12 AWG conductors from each auxiliary contact to the respective drive for proper signal to the drive of the disconnect status. Where required by the drive system, provide separate conduit for these conductors.

G. Manual starter shall be a toggle type switch with overload protection, designed for use on motor circuit. Provide enclosure suitable for area installed.

H. Safety switches shall be manufactured by Square D, General Electric or Siemens.

2.09 EXISTING DISTRIBUTION EQUIPMENT

A. Where connections are made in existing panelboards or other distribution equipment, the panel index shall be revised to indicate the new loads served. All existing panelboards that do not have a circuit directory card mounted in a frame with noncombustible plastic cover shall have one installed on the inside of the door. All directory cards shall be properly filled in, using a typewriter, and indicate areas and devices served by each unit. Where spares or spaces are provided, mark these designations in pencil by hand.

B. New circuit breakers, disconnects, starters, etc. added to existing equipment shall be the same frame size and interrupting capacity as existing panelboards and circuit breakers. New circuit breakers installed in existing panelboards shall be listed as fully compatible with the panelboard.

2.10 NAMEPLATES

A. Black phenolic nameplates, screw-on type, with ¼" minimum white engraving shall be furnished for all equipment and properly fastened with brass screws. Lettering shall be minimum 1" high where label is above eye level. Nameplates shall be provided for the following equipment:

1. Panelboards
2. Disconnect Switches
3. Junction boxes larger than 4-11/16"

B. Submit a complete listing of all nameplates required, for review and approval prior to engraving.

2.11 FIRE ALARM SYSTEM

A. New devices shall be UL listed compatible with the existing Mircom series 1000 conventional FACP located in vestibule 111.

B. Pre-inspection: Prior to ANY work on the existing fire detection and alarm systems, this Contractor shall perform a 100% test/inspection of the existing system. This test shall document the condition of the existing system. The test shall be witnessed by the Owner's representative, and a complete pre-inspection report prepared and submitted within 24 hours of the pre-inspection. Any defective devices or other system anomalies shall be brought to the attention of the Owner's representative at that time, and noted on the pre-inspection test report. This Contractor shall be responsible for the proper operation throughout the construction period for all devices which are operational at the time of the pre-inspection.

C. Provide all wiring, peripheral devices and programming, as required to connect new devices to existing notification appliance circuits (NAC), initiating device circuits (IDC), signal line circuits (SLC) and to shut down the equipment associated with the devices.

D. Specific System Operations

1. Upon activation of a duct mounted system smoke detector, the associated HVAC equipment shall be shut down, the system shall indicate a supervisory signal at the FACP. The Fire

Department shall not be notified. The central station shall be notified as directed by the Owner.

E. All equipment and components shall be new, and the manufacturer's current model.

F. System Peripheral Components:

1. Smoke Detector, Conventional, 4-wire Photoelectric type, UL 268, furnished and installed by General Contractor

a. Provide with relays and heaters where required. Provide Remote LED alarm indicators and key operated test stations shall be provided for each duct type detector.

i. Where duct detectors monitor and/or shutdown equipment which is remote from the detector (such as roof mounted equipment), the detector shall be labeled with the identifier of equipment which is monitored and/or shutdown (i.e. “RTU-6”). This identifier shall also be used at the system annunciator.

ii. Also provide 6” red reflective adhesive identifier labels at the monitored and/or shutdown equipment, which are visible from the roof access point.

PART 3 – EXECUTION

3.01 MATERIALS AND WORKMANSHIP

A. Work shall be executed in workmanlike manner and shall present neat, rectilinear and mechanical appearance when completed. Maintain maximum headroom at all times. Do not run raceway exposed unless shown exposed on drawings. Material and equipment shall be new and installed according to manufacturer’s recommended best practice so that completed installation shall operate safely and efficiently.

B. This Contractor shall review installation details of all electrical equipment in public areas with the Architect and cooperate fully with the Architect in this regard. Any work installed which is not reviewed with and approved by the Architect is subject to re-work at no increase in contract price.

C. All workmanship shall be of the highest quality, as determined by the Engineer. This Contractor will be required to repair or replace all Work which is not of the highest quality and workmanship.

D. All equipment and components shall be installed in strict compliance with manufacturers' recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation.

E. Conductor fasteners shall be tightened with a torque tool in good condition to factory specifications. At time of inspection, torque tool(s) shall be available to demonstrate proper torque.

3.02 CONTINUITY OF SERVICES

A. Do not interrupt existing services without Owner’s and Architect’s approvals.

3.03 TESTING, INSPECTION AND CLEANING

A. Test wiring and connections for continuity and grounds before fixtures are connected; demonstrate insulation resistance by megger test as required. Insulation resistance between conductors and grounds for secondary distributions systems shall meet NEC requirements.

B. Verify and correct as necessary: voltages, tap settings, trip settings and phasing on equipment from secondary distribution system to points of use. Test secondary voltages at loadcenters, and at other locations on distribution systems as necessary. Test secondary voltages under no-load and full-load conditions.

C. Test lighting fixtures with specified lamps in place for 10 hours. Do not operate lamps other than for testing before final inspection by Architect. Replace lamps that fail within 90 days after acceptance by Engineer within Contract Price.

D. Provide necessary testing equipment and testing.

E. Failure or defects in workmanship or materials revealed by tests or inspection shall be corrected promptly and retested until satisfactory results are achieved. Replace defective material.

F. Final Inspection

1. At the final inspection, a factory-trained representative of the manufacturer of the major equipment shall demonstrate that the systems function properly in every respect.

G. Clean panels and other equipment. Panelboard interiors shall be cleaned and vacuumed. Equipment with damage to painted finish shall be repaired to Architect's satisfaction.

H. After completion of project, clean the exterior surface of equipment included in this section.

3.04 WARRANTY

A. Materials provided under this section shall be warranted against defects in materials and workmanship by this Contractor for not less than one (1) year from the date of substantial completion.

B. This Contractor shall respond to the site to address any warranty contact from the Owner within 48 hours. If the defective item can be repaired, it shall be repaired within 48 hours. Repairs shall be to the full satisfaction of the Owner, and repairs which render an item in a condition less than new will not be accepted. If the item cannot be repaired within 48 hours, it shall be replaced within 48 hours. If the item cannot be repaired or replaced within 48 hours, the contractor shall provide such temporary work as directed by the Owner to address the issue until such time as the issue is permanently addressed. If the issue appears to be across all same or similar products, the contractor shall be prepared to address (repair or replace) the remaining items.

3.05 OPERATION AND MAINTENANCE MANUALS

A. The following information shall be submitted for record purposes at project closeout:

1. Final as-built drawings and information for items listed in this paragraph
2. Wiring diagrams
3. Installation information
4. Signed Permits/Certificate of Inspection
5. Warranties.

B. Two (2) Operation and Maintenance Manuals shall include the following information: one copy of all approved submittals, Instruction books and/or leaflet, recommended renewal parts list and list of local distributors who service installed system. O&M manuals shall be bound in properly sized, indexed and tabbed 3-ring binders, with front and edge labeling.

C. INSTRUCTION: Provide instruction as required to the building personnel and fire and safety personnel. "Hands-on" demonstrations of the operation of the system shall be provided.

3.06 ACCESS AND ACCESS PANELS

A. Provide proper access to material or equipment that require access, inspection, replacement, repair or service. If proper access cannot be provided, confer with Engineer as to best method of approach to minimize effects of reduced access.

3.07 FIRE BLOCKING AND STOPPING

A. Provide all materials and labor to penetrate or remove and re-install existing fire blocking, or re-route wiring to avoid fire blocking.

B. Provide fire stopping for all electrical conduits which enter or pass through fire rated walls or floors. Materials and methods of fire stopping shall be approved by UL. Fire seal fittings shall be used around cable, in sleeves, or in core drilled holes passing through fire rated walls and floors. Fire stopping shall be T&B Fire-Seal, O.Z. Gedney, Minnesota Mining and Manufacturing Company or approved equal.

3.08 WIRING METHODS

A. Install wire and cable in approved raceways as specified and as approved by authorities that have jurisdiction.

B. Surface metal raceways shall not be used unless explicitly specified and shown on Drawings, or approved in advance by the Engineer. Do not use surface raceways on floor. Surface raceways shall be secured to the mounting surface using concealed means. Use only fittings provided by the manufacturer of the raceway system provided. Use of surface metal raceways, where approved, in lieu of cutting, fishing wiring, patching and painting, shall not be the basis of any claim for additional compensation.

C. Wiring methods shall be as follows:

1. Interior, finished, dry locations, concealed – EMT or Type MC Cable.
2. Interior, finished, dry locations, exposed – None (conceal wiring methods).
3. Interior, mechanical, electrical or other utility spaces, exposed – EMT or RGS.
4. Interior, wet locations – RGS.
5. Exterior, rising through or above grade – RGS.

D. Only the best possible workmanship for type MC cable installation shall be accepted. Type MC cable which is not properly supported, neatly installed, or bundled shall be removed and replaced at no additional cost. The acceptability of Type MC cable installation shall be solely the determination of the Engineer.

E. Install wiring methods in accordance with requirements for an assembly use group for such areas.

F. Provide flexible conduits for connections to electrical equipment and to appliances and equipment that are subject to movement, vibration or misalignment; where equipment connections dictate; and where noise transmission must be eliminated or reduced.

G. All conductors shall be installed in raceways, or fished in, or run in attic spaces, as required by the NEC. Wiring shall be concealed in finished spaces.

H. All wiring in finished spaces shall be run concealed, except where surface metal raceway systems are specifically noted on the plans or otherwise approved. Provide chases, soffets and boxouts, finished to match surrounding areas, as required.

I. Splices shall be made only at device outlet boxes. Addition or re-use of boxes in finished areas solely for the purpose of splicing will not be accepted.

J. All device outlet boxes shall be set flush to the final finish surface. All openings in the surface finish around the box shall be filled in accordance with the MEC. Where device outlet boxes are located in an area with existing device outlet boxes, match mounting heights, but not less than 18” above finish floor. Mount all boxes true and plumb. Patch and paint as needed.

K. All wiring shall be new. Remove all existing wiring and raceways to the maximum extent possible. Cut back and abandon concealed wiring and raceways.

L. All conductors shall be neatly arranged and bundled, without excess cable at any point, but with reasonable slack to allow installation and removal of the device.

3.09 GROUNDING

A. Bond and ground equipment and systems connected under this Section in accordance with standards of MEC and other applicable regulations. Provide approved means for terminating and connecting grounding conductors, such as lugs, crimp-on terminals, green ground screws, grounding wirenuts, etc.

B. Conduit system shall be electrically continuous throughout. Equipment frames, enclosures, boxes, etc. shall be grounded by use of green colored equipment ground conductor sized as per Table 250.122 of MEC. Raceway ground alone will not be accepted.

C. Green bonding jumper shall be installed in flexible conduits.

3.10 MOTORS AND CONNECTIONS

A. Motors will be provided under other Sections.

B. Check electrical connections and sizing of motor circuit protection and prevent damage to motors and equipment from incorrect direction of rotation.

C. Review existing conditions prior to disassembly/disconnection for verification of size, speed, and operation of existing motors.

D. Consult drawings and specifications and shop drawings for verifications of size, speed, and operation of motors furnished under other Sections.

E. Final connection to appliances and motors shall be made with flexible conduit (at least 16” long) with green ground wire installed.

F. Obtain necessary control wiring and interlocking diagrams from equipment suppliers for installation under this Section and connect equipment circuits for proper sequence of operation. Refer to sequence of operations provided under other Sections, and circuit equipment via control devices such as thermostats, relays, aquastats, contactors, etc.

3.11 WIRING DEVICES

A. Mount all wiring devices plumb in device outlet boxes. Center devices on boxes, and set true within the device plate. Set device plates so all edges contact surface, and conceal box edge.

B. Side wire devices only. Back wiring will not be accepted.

3.12 CIRCUIT BREAKERS

A. Install circuit breakers in panelboards. Mark panel schedule accordingly. Panel markings shall be printed by typewriter, printer or other suitable means. Handwriting will not be acceptable. Utilized circuits shall be marked in ink. Spare or spaces shall be so marked in pencil, and may be marked by hand. No circuit shall be described in a manner that depends on transient conditions of occupancy.

3.13 FIRE ALARM

A. Installation shall be in accordance with the NEC, NFPA 72, local and state codes, as shown on the drawings, and as recommended by the major equipment manufacturer.

B. Permitting

1. It is recognized that various jurisdictions may have varying requirements for issuance of permits for work related to fire protection systems. Be responsible for determining the local authority(ies) having jurisdiction, what their requirements are, and providing all documents required for permitting. The Engineer will provide the contract document plans, specifications, and where requested by the AHJ, a fire protection construction documents narrative.

2. Coordinate with General Contractor for submission of, and/or prepare and submit, an NFPA 241 plan as required by the AHJ.

C. Comply completely with 780 CMR 33, Safeguards During Construction. Comply with NFPA 241 as listed in 780 CMR 35.

D. Wiring Methods

1. All conduit, junction boxes, conduit supports and hangers shall be concealed in finished areas and may be exposed in unfinished areas. All junction boxes shall be spray painted red and labeled “Fire Alarm”, exposed conduit shall be EMT with minimum 2” wide red band maximum spacing every 5’, no less than one 2” per conduit between devices. Pre-painted raceways are not acceptable. System smoke detectors shall not be installed prior to the system programming and test period. If construction is ongoing during this period, measures shall be taken to protect smoke detectors from contamination and physical damage.
2. Cable must be separated from any open conductors of Power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, as per NEC Article 760.
3. Conduit shall be 3/4 inch (19.1mm) minimum.
4. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG for initiating device circuits and signaling line circuits, and 14 AWG for notification device circuits.
5. Wire and cable not installed in conduit shall have a fire resistance rating suitable for the installation as indicated in NFPA 70 (e.g., FPLR). Where located in ducts, provide suitably approved cable.
6. All field wiring shall be completely supervised.

E. Test: Provide the service of a competent, factory-trained engineer or technician authorized by the manufacturer of the fire alarm equipment to technically supervise and participate during all of the adjustments and tests for the system.

1. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.
2. Check installation, supervision, and operation of smoke detectors.

END OF SECTION 26.00.00

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